

Examinations Information

for

***Above Ground Mine Production Manager
and Underground Mine Production Manager
Certificates of Competence***

(granted under the Mine Health and Safety Act 2004)

EXPLANATORY NOTE

The *Mine Health and Safety Act 2004* and *Mine Health and Safety Regulation 2007* commenced on 1 September 2008 resulting in the repeal of the *Mines Inspection Act 1901* and *Mines Inspection General Rule 2000*. It also resulted in the application of the *Occupational Health and Safety Regulation 2001* to mines. The commencement of the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011* on 1 January 2012 repealed the *Occupational Health and Safety Regulation 2001* and its supporting regulation.

The current legislation continues with a similar requirement for the statutory certification of production managers as the previous and includes a savings provision which recognises certificates of competence as production managers issued under the previous Act. The Metalliferous Mines and Extractive Industries Competence Board, established under the current Act replaced the previous Above and Below Ground Mine Production Managers Boards. This new Board met in late 2008 and endorsed the continuation of the previous examination system for the issue of production manager certificates which will now be based on the new legislation.

Candidates should make themselves familiar with all of the current legislation including the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*. Candidates should also make themselves familiar with the content of this document which will give some guidance as to the scope of the examination and the style of questions. Further guidance will be given as to the areas of the legislation that will be examinable at a briefing session to be held approximately one month prior to the examination. Candidates are also advised to access the Department of Trade & Investment, Regional Infrastructure & Services (DTIRIS) website for Mine Safety at www.dpi.nsw.gov.au/minerals/safety where they will be able to access other useful information such as the library of Safety Alerts, Guidelines and Guidance Notes.

Candidates should make themselves familiar with the following legislation:

1. *Work Health and Safety Act 2011*
2. *Work Health and Safety Regulation 2011*
3. *Mine Health and Safety Act 2004*
4. *Mine Health and Safety Regulation 2007*

CERTIFICATES OF COMPETENCE FOR ABOVE GROUND AND UNDERGROUND MINE PRODUCTION MANAGERS

1. ANNUAL EXAMINATION

Examinations are conducted on an annual basis for persons seeking to obtain either a certificate of competence as an Above Ground or Underground Mine Production Manager. They are conducted by DTIRIS on behalf of the Metalliferous Mines and Extractive Industries Competence Board and the Above Ground and Underground Mine Production Manager Examiner Panels. The Board is appointed by the Minister under Section 112 of the *Mine Health and Safety Act 2004*.

2. ADVERTISEMENT OF EXAMINATIONS

An advertisement shall be placed in *The Daily Telegraph* and *The Sydney Morning Herald* three (3) months prior to the date of each examination, inviting candidates to make an application for examination.

Advertisements for the Underground examination are also placed in the Broken Hill, Cobar and Orange local newspapers.

The advertisement shall invite prospective applicants to obtain a copy of the application form by contacting the DTIRIS in any of the following methods:

Website: www.dpi.nsw.gov.au/minerals/safety/resources/qualifications:

Email a request to: metexcompetence.board@industry.nsw.gov.au

Post a request to:

The Examinations Officer
Mining Industry Competencies Unit
Department of Trade & Investment, Regional Infrastructure & Services
PO Box 344
Hunter Region Mail Centre NSW 2310

and shall provide a closing date by which applications must be submitted to the Secretary.

3. APPLICATIONS FOR EXAMINATION

The completed application form shall be forwarded to the Secretary of the Metalliferous Mines and Extractive Industries Competence Board by the closing date nominated on the press notice. The application form shall be accompanied by documentary evidence of the applicant's:

- (a) sobriety and good conduct
- (b) educational qualifications and/or competency assessments
- (c) practical mining experience for the required period as specified
- (d) other documentary evidence specified on the application form.

Such evidence shall be accompanied by a Statutory Declaration that the testimonials produced are genuine and all statements made are true. Copies of qualifications and/or competency assessments supplied shall be signed by a Justice of the Peace that he/she has sighted originals.

The application must be accompanied by the prescribed fee of \$200.00 (GST exempt) and shall admit an applicant to one examination only.

4. ASSESSMENT OF APPLICATIONS

Applications will be assessed initially by the Secretary, or the Chairman of the Examiner Panel, or their delegate, to determine whether they are complete. Candidates who submit incomplete applications will be asked to supply the necessary information by a stated date, which shall be no less than two weeks prior to the Examiner Panel meeting.

5. SETTING OF WRITTEN EXAMINATION PAPER

The Secretary shall ensure that a written examination paper is set for the forthcoming examination prior to the Examiner Panel meeting. The paper will initially be set by one or more Panel members and will be reviewed at the meeting with final questions being decided at the meeting.

The Board shall determine the pass mark for each examination.

6. PANEL OF EXAMINERS FOR PRODUCTION MANAGERS

There are two Examiner Panels for Production Managers, Above Ground and Underground, appointed by the Metalliferous Mines and Extractive Industries Competence Board who in turn are appointed by the Minister under the *Mine Health and Safety Act 2004*.

The Panels comprise representatives from the inspectorate, industry groups, professional bodies (Institute of Quarrying and AusIMM) and educational institutions (TAFE and University of NSW). Both Panels are convened by the Chief Inspector of Mines or their delegate.

The Panels set the standards for eligibility and assessment criteria. The Examiner Panels set and mark the examination papers, review results and make recommendations for the issue of certificates of competence to the Board.

7. PANEL OF EXAMINERS MEETING TO REVIEW APPLICATIONS

The Panels will meet approximately six weeks prior to the date of the examination.

A quorum of a Panel shall be three members. In the event of a difference of opinion between members all decisions of the Panel shall be those of the majority provided that in the event of an equality of votes on any matter the Convenor shall have a casting vote.

The Panel will review applications at the meeting and decide whether all requirements are met and either approve or reject the applications. Incomplete applications may not be assessed by the Panel. Completed applications must include:

- Certified copies of all evidence documents (ie: academic transcripts, first aid certificates, etc)
- Current resume and expanded explanation of the roles covering each of the areas of experience
- Reference from your employer(s) certifying the experience details are correct.

The Panel may require an applicant who has failed a prior examination conducted by the Board to show cause why a further application by said applicant should be allowed to proceed. Any final decision will be made by the Board on the recommendation of the Examiner Panel.

Following the meeting applicants will be advised in writing by the Secretary of the Board's decision. Applicants will be required to take this letter with them to the examination. Applicants allowed to sit will be advised of the time and place of the examination (both written and oral) and given an examination identification number.

8. EXAMINATION VENUE

Examinations may be held at the Department of Trade & Investment, Regional Infrastructure & Services office at Maitland and other regional offices at Broken Hill, Orange and Cobar, depending on the number of candidates and their locations.

Examination for both the written and the oral examination will be conducted on the same day. Candidates will either be taken from the 'written paper' examination room and given the oral examination in a separate room, or given the oral examination at a nominated time on completion of the written examination.

Oral examinations will be conducted by a panel of two or three Panel members or other competent persons nominated by the Convenor of the Panel and approved by the Board.

The oral examination marks will be forwarded to the Secretary immediately upon completion of the examination.

9. MARKING OF WRITTEN EXAMINATION PAPERS

The written examination papers of each candidate will be copied by the Secretary and forwarded to each member of the Examiner Panel for marking.

Panel members shall mark the examination papers and forward the results to the Secretary.

The Secretary shall compile the results in a table setting out each candidate's mark for each section and the candidate's percentage mark for each section.

10. PANEL MEETING TO REVIEW RESULTS

The Panel will meet after the examination and review the compiled results as supplied by the Secretary. The Panel will decide whether applicants have passed or failed and the Secretary will advise candidates in writing of their result.

The Panel will indicate to the Secretary where a candidate needs to be notified that they have failed a particular part or parts of the examination or whether they have given an answer that would endanger the safety and health of a person if acted upon.

The results of the examinations are then forwarded to the Board for their information. Following the Board meeting all examination papers will be sent to storage for audit purposes only.

11. QUALIFICATION AND EXPERIENCE REQUIREMENTS OF APPLICANTS

Persons seeking to be examined for certificates of competence as production manager of above ground or underground mines are required to have the following qualifications and experience: (as shown below or over pages to follow)

CERTIFICATE OF COMPETENCE AS ABOVE GROUND MINE PRODUCTION MANAGER

QUALIFICATIONS

Candidates must possess a degree or diploma in mining engineering from a university or other educational body approved by the Metalliferous Mines and Extractive Industries Competence Board (herein the Board) or a qualification recognised by that Board as equivalent to such a degree or diploma. Equivalent qualifications include:

- an advanced certificate or diploma in extractive industries issued by a registered training organisation
- a degree or diploma in engineering or science with a graduate diploma in mining engineering from a recognised university
- a degree or diploma in civil or mechanical engineering with additional study in mining subjects related to rock mechanics/mine slope stability and blasting

and must possess a current First Aid Certificate issued by the St John Ambulance Australia or other institution accepted by the Board.

EXPERIENCE

An applicant for examination shall have a minimum of three years practical experience made up as follows:

(a) Twelve months practical experience in a metalliferous above ground mine or quarry under the control of a certificated mine production manager, of which period of experience at least three months shall be involved in the handling and use of explosives. Practical experience must involve the personal participation in the loading and firing of at least 12 production blasts in an above ground mine or quarry. The balance should be made up of some approved type of mining work, such as:

* Equipment maintenance	* Plant operation (fixed and mobile)
* Drainage	* Road formation
* Drilling	* Site rehabilitation
* Open cut or quarry production	* Stockpiling
* Overburden removal	

(b) Eighteen months experience in some approved type of mining work such as:

* Coal mining (limit of three months only)	* Supervision and safety
* Environmental evaluations	* Surveying
* Equipment evaluation	* Training
* Quality control	* Tunnelling (limit of three months only)
* Sampling	* Underground metalliferous mining (limit of three months only)
* Slope stability investigations	* Work study

(c) Six months experience in some approved type of mining work such as:

* Asphalt or concrete products	* Geology
* Budgets	* Industrial relations
* Contracts control	* Mine design
* Engineering	* Rehabilitation studies

In this rule 'approved' means approved by the Panel.

The Panel may, if it thinks fit, allow a candidate with more than 3 years practical experience in a mine to sit for an examination notwithstanding that the candidate has not had the necessary experience required by these rules.

CERTIFICATE OF COMPETENCE AS UNDERGROUND MINE PRODUCTION MANAGER

QUALIFICATIONS

Candidates must possess a degree or diploma in mining engineering from the University of Sydney or from the University of New South Wales or other educational body approved by the Board or a qualification recognised by the Board as equivalent to such a degree or diploma.

Candidates must also possess a current First Aid Certificate issued by the St John Ambulance Australia or other institution accepted by the Board.

EXPERIENCE

An applicant for examination shall have a minimum of three years practical experience made up as follows:

- (a) Twelve months practical experience in an underground metalliferous mine under the control of a certificated mine production manager. This experience shall consist at least three months work at the face, in production or development mining with hands on experience in the drilling, charging and firing of blast holes, loading of ore or mullock and ground control. The balance is to be made up in some approved type of mining work such as:

* Assisting tradespersons	* Ore or mullock haulage and transport
* Drilling	* Plant operation: mobile or fixed
* Ground control, eg, bolting, meshing, shotcreting, timbering, scaling	* Providing supplies, explosives and equipment
* Mine filling	* Roadway and track preparation, servicing and maintenance
* Mine servicing, equipment installations and drainage	* Shaft, passes, and chute inspection and repairs

- (b) Eighteen months experience in some approved type of mining work such as

* Above ground metalliferous mining (limit of three months only)	* Quality control
* Coal mining (limit of three months only)	* Rock mechanics
* Environmental evaluations	* Sampling
* Mining investigations surveying	* Supervision
* Mine planning	* Training
* Mine rescue	* Tunnelling (limit of three months only)
* Mine ventilation	* Work study
* OHS	

- (c) Six months experience in some approved type of mining work such as:

* Budgets	* Metallurgy
* Contracts control	* Rehabilitation Studies
* Engineering	* Research
* Industrial Relations	* Services
* Mine Geology	

In this rule 'approved' means approved by the Panel.

The Panel may, if it thinks fit, allow a candidate with more than 3 years practical experience in a mine, to sit for an examination notwithstanding that the candidate has not had the necessary experience required by these rules.

12. EXAMINATIONS

Candidates will be advised in writing by the Secretary of the Board of the time and place of the examination and are required to be in attendance 15 minutes before commencement time. Candidates will also be provided with an examination identification number for use at the examination instead of their name. Candidates are required to take the letter to the examination with them and present to the supervising officer. Candidates should also provide photographic proof of identity to the supervising officer, such as a current driver's licence.

Mobile phone and digital devices must be **switched off** and left with the examination supervisor along with any bags taken into the examination room. Candidates will be supplied with pens and writing paper.

13. WRITTEN EXAMINATION PAPER (Above Ground and Underground)

The written examination for both the above ground and underground certificates consists of a three-hour examination for each certificate on the requirements and application of the *Mine Health and Safety Act 2004*, *Mine Health and Safety Regulation 2007*, the *Work Health and Safety Act 2011* and the *Work Health and Safety Regulation 2011*.

The paper shall consist of three parts as follows:

- **Part A** shall consist of seven (7) questions worth 5 marks each based on Parts 1, 2, 5 and 6 of the *Work Health and Safety Act 2011* * and Chapters 2, 3 and 4 of the *Work Health and Safety Regulation 2011**. Candidates will be required to pass this part, with a pass mark to be determined by the Board.
- **Part B** shall consist of seven (7) questions worth 5 marks each based on the *Mine Health and Safety Act 2004* and the *Mine Health and Safety Regulation 2007*. Candidates will be required to pass this part, with a pass mark to be determined by the Board.
- **Part C** shall consist of two (2) questions based on the application of the both Acts and Regulations with respect to practical situations at either above ground metalliferous mines and quarries or underground metalliferous mines. In their answers candidates are expected to demonstrate how the legislation should be applied. The questions are worth 15 marks each. Candidates will be required to pass this part, with a pass mark to be determined by the Board.

**While certain parts of the noted legislation have been identified as examinable, it should be noted that the examination questions can come from any part of current legislation if it pertains to the duties (perceived or otherwise known) of either a Mine Production Manager for an Above Ground Mine or an Underground Mine.*

The purpose of Part C is to test candidates' knowledge of the application of the legislation with respect to the management of the safety and health at a mine. Questions will relate to practical situations where the candidate will be told they are the nominated production manager of a mine and they are required to demonstrate their ability to systematically manage the situation with regard to complying with all applicable legislation. In answering the questions the candidates are asked to refer to the relevant sections and clauses that apply. In the answers the candidates are not required to quote the actual section or clause numbers but rather to make reference to what the legislation states.

Recent questions have been based on actual hazardous situations that have occurred at NSW mines and were subject to departmental Safety Alerts. It is highly recommended that candidates familiarise themselves with the Department's Safety Alerts which can be accessed on the Department's website at www.dpi.nsw.gov.au/minerals/safety/safety-alerts

As a guideline the pass mark for the written paper will be a minimum of 60% for each part and for the combined examination. The overall pass mark combining written and oral marks will be a minimum of 65%.

Notwithstanding the marks achieved in any part of the examination, the Board may fail a candidate, who gives an answer that if acted upon, would endanger the safety and health of a person.

On the question papers the following information shall be stated:

- all questions (total of 16) to be answered
- the possible number of marks obtainable for each question
- that candidates are required to pass each part: Part A, Part B and Part C
- the time allowed to complete the paper: 3 hours, with extra time given if the candidate is required to undergo an oral examination during the written paper

14. CURRENT LEGISLATION

It is the responsibility of each applicant to ensure that the legislation that they study for the examination is the most recently amended version of the: *Work Health and Safety Act 2011*, *Work Health and Safety Regulation 2011*, *Mine Health and Safety Act 2004* and *Mine Health and Safety Regulation 2007*. This can be achieved by downloading the latest version of the in-force legislation from the NSW Government Parliamentary Council's website at: www.legislation.nsw.gov.au/search/inforce

The legislation can also be accessed through the DTIRIS web site at www.dpi.nsw.gov.au/minerals/safety/legislation

15. OTHER USEFUL INFORMATION

Other useful information can also be accessed from the Mine Safety section of the DTIRIS web site, such as the *Mine Safety Update* newsletter and a library of Safety Alerts, Guidelines and Guidance Notes.

Further advice can be obtained from the Secretary of the Metalliferous Mines and Extractive Industries Competence Board via email at: metexcompetence.board@industry.nsw.gov.au

16.0 CONDUCT OF EXAMINATIONS

16.1 WRITTEN EXAMINATION

Candidates shall write their answers to the questions in the presence of one or more members of the Board or an officer of Department of Trade & Investment, Regional Infrastructure & Services or their delegate (herein known as supervising officer) and in accordance with the following instructions:

- (a) Candidates on entering the examination room shall present to the supervising officer the letter of authorisation sent to them from the Secretary of the Board, or their delegate, inviting them to sit for the examination. This letter contains the examination identification number that the candidate must use. Candidates will also be asked to provide photographic proof of their identity to the supervising officer by such document as a current drivers licence.
- (b) Candidates shall be seated in their places 15 minutes before the time fixed for the examination. After this time no candidate shall be admitted to the examination room unless under very exceptional circumstances and by express permission of the supervising officer, provided always that no person who has seen the paper shall have previously left the room.
- (c) All candidates shall write their distinguishing number at the top of every page on which answers are written. Candidates must not write their name on any page.
- (d) No writing paper, pens, electronic aids, books or manuscripts shall be brought into the examination room by the candidates. All pens, paper fasteners and writing paper shall be provided by the Department.
- (e) No communication by word or otherwise between candidates shall be allowed during the examination. Candidates wishing to communicate with the supervising officer shall stay in their place, and raise their hand.
- (f) If the supervising officer is convinced that copying or collusion has taken place between candidates the officer must immediately inform the candidates of the officer's concern and take such action to remedy the continuance of the situation. The officer must report the incident to the Board on completion of the examination. If the Board is of the opinion that copying or collusion has taken place between candidates it may disqualify the candidates.
- (g) Warning shall be given 10 minutes before the time fixed for giving up papers. When the papers are called for, all candidates shall cease work immediately.
- (h) Should candidates be taken from a written examination paper room by a supervising officer or examiner in order to undergo an oral examination, that candidate shall be given extra time to complete the written paper, for the time in which the candidate was absent from the written examination room.
- (i) Immediately after each examination the worked papers shall be sealed up by the supervising officer. Before they are so sealed, no person (not being a member of the Board or officer of the Department) shall be allowed to enter the room except with the permission of the Board.

16.2 ORAL EXAMINATION

The oral examination shall be conducted separately for each candidate with a view to ascertaining his/her practical knowledge of mining and their ability to manage the safety and health of persons working in an above or underground mine. The oral examination will be conducted as follows:

- (a) Candidates will either be taken from the written examination by the supervising officer in numerical order of their identification number and presented to the examination panel as per their identification number, or present themselves at a nominated time after the written examination.
- (b) Candidates will be provided with a set of questions, which the panel invites the candidates to answer in the order they prefer. Candidates will be given approximately five (5) minutes to answer each question.
- (c) There will be usually be between 3 to 5 questions and the oral examination should take between 20 to 30 minutes depending on the discretion of the panel.
- (d) The questions and the required answers will be set by the panel prior to the examination.
- (e) The questions will include practical hazardous situations at a mine. Candidates are required to explain how they would handle the situation if they were the manager of the mine.
- (f) The examination panel may prompt the candidates if necessary.
- (g) On completion of the oral examinations, the panel shall provide the Secretary of the Board a written report of the candidate's marks.

17.0 ASSISTANCE TO CANDIDATES SITTING FOR WRITTEN EXAMINATION PAPER FOR EITHER THE ABOVE GROUND OR UNDERGROUND MINE PRODUCTION MANAGERS CERTIFICATES OF COMPETENCE

17.1 SAMPLE QUESTIONS AND ANSWERS - WRITTEN PAPER

PART A

Question 1

Section 19 Primary duty of care *WHS Act*

Section 19 (1) of the WHS Act outlines the primary duty of care for a person conducting a business or undertaking to ensure, so far as is reasonably practicable, the health and safety of workers engaged, or caused to be engaged by the person, and workers whose activities in carrying out work are influenced or directed by the person, while they are at work in the business or undertaking. It extends that duty to seven other specific requirements. If the first requirement is, so far as is reasonably practicable, the provision and maintenance of a work environment without risks to health and safety, what are three other requirements?

Answer: (provide 3 of the following)

- a) the provision and maintenance of safe plant and structures, and
- b) the provision and maintenance of safe systems of work, and
- c) the safe use, handling, and storage of plant, structures and substances, and
- d) the provision of adequate facilities for the welfare at work of workers in carrying out work for the business or undertaking, including ensuring access to those facilities, and
- e) the provision of any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking, and
- f) that the health of workers and the conditions at the workplace are monitored for the purpose of preventing illness or injury of workers arising from the conduct of the business or undertaking.

Question 2

Section 191 Issue of improvement notices *Section 195 Power to issue of prohibition notice* *WHS Act*

In your own words explain what you consider would be the circumstances under which an Inspector would issue an improvement notice under Section 191 and a prohibition notice under Section 195 of the WHS Act. In your answer include the outcomes the Inspector would be seeking in issuing each notice.

Answer: An Inspector would issue an improvement notice under Section 191 if he/she considered that any person is contravening / or has contravened the WHS Act or Regulations in circumstances that make it likely the contravention will continue or be repeated. In the notice issued the Inspector would require the person to remedy the contravention within a specified period.

An inspector would issue a prohibition notice under Section 195 if he/she was of the opinion that any activity is occurring, or may occur, at a workplace that involves or will involve a serious risk to the health or safety of a person emanating from an

immediate or imminent exposure to a hazard. The Inspector may give the person who has control over the activity a direction prohibiting the carrying on of the activity, or the carrying on of the activity in a specified way, until the Inspector is satisfied that the matters that give or will give rise to the risk have been remedied.

PART B

Question 8 Section 30 MHS Act

Contents of mine safety management plan

Section 30 of the Mine Health and Safety Act 2004 sets out the requirements for the content of a mine safety management plan. What must a mine safety management plan contain?

Answer:

A mine safety management plan must include

(1) summaries of and references to:

- (a) any regulations under this Act that apply to the mine
- (b) any systems, policies, programs, plans and procedures developed and implemented under this Act or regulation that apply to the mine
- (c) any codes, standards or guidelines that apply to the mine

(2) the management of risk:

The basis for the identification of hazards, and the assessment of risks arising from those hazards.

The development and implementation of controls for those risks.

(3) other documents:

- (a) the document that sets out the management structure required under Subdivision 3, and
- (b) the contractor management plan required under Subdivision 4, and
- (c) the emergency plan required under Subdivision 5, and
- (d) any other matter required by the regulations.

Question 12 Clause 41 MHS Regulation

Handling of explosives

Clause 41 of the Mine Health and Safety Regulation 2007 list six (6) matters in which the operator of a mine must take into consideration when assessing the risks associated with the handling of explosives. If the first of these considerations is “the loading and stemming of blast holes” list another three (3) of the matters to be taken into consideration.

Answer

Clause 41 lists the following:

- (a) the loading and stemming of blast holes
- (b) the connection of initiation systems
- (c) exclusion zones
- (d) dealing with misfires
- (e) the ignition of explosives or explosive precursors by an electric charge
- (f) the security of explosives and explosives precursors

PART C - NOTE:

As there is no pool of past papers and questions relating to the current legislation, the following questions and answers are from past papers relating to previous legislation which were previously included in this document and have been retained. These questions will give candidates an insight into the format of the Part C questions and answers. It is suggested that candidates attempt the questions as though they relate to the current legislation below:

Work Health and Safety Act 2011
Work Health and Safety Regulation 2011
Mine Health and Safety Act 2004
Mine Health and Safety Regulation 2007

Obviously the answers will be different because they will relate to completely different legislation. An opportunity to review the answers may be made available if time permits at the briefing session to be held approximately one month before the examination.

Question 15 *Serious Accident*

An employee has just received a serious injury at your mine whilst using machinery. With reference to your responsibilities under the Act and General Rule, describe the actions you would take to ensure the event does not re-occur?

Answer A discussion should be provided by the candidate of the need to review the use of the machinery not only as it was involved in this accident, but also where it is used elsewhere in the mine.

The review should involve:

1. A thorough investigation of the accident
2. A risk assessment of the use of the equipment in this application
3. Assessment of the process or method for which the equipment is being used. Whether there is a better alternative.
4. A risk assessment of the use of the machinery in its other applications and use throughout the mine.
5. Required changes to all procedures associated with the use, maintenance and inspection of the machine.
6. Implementation of additional controls, that includes re-training of all personnel.

This review would address the requirement of Section 46 of the Act for the general manager to identify and manage all risks to employees. This requires either the elimination of the risk or the controlling of the risk, to the fullest possible extent.

Also General Rule, clause 19, sets out the order of priority for dealing with risks by either:

- elimination
- control of the risk at source
- minimising the risk by means that include safe work procedures
- provision of personal protective equipment

Clause 19 also specifically requires for all persons that may be subject to the risk to be involved in any risk assessment and control measures.

In this review all people involved in the use of the machinery should be included. This review would take place as follows:

1. Investigation of accident

A person independent of the accident site would preferably carry out the investigation. It would involve a thorough examination of the site and machinery. Independent experts may need to be brought in to provide an independent report on the machinery. This would determine whether there was any defect with the machinery, failure of parts or lack of maintenance. The experts may also be able to provide advice as to whether the machine has been used and maintained in accordance with the manufacturer's requirements. Also whether there is any evidence of operator error.

Persons to be interviewed would include the operator and other operators who use the machine, witnesses, maintenance people, supervisors and managers.

Documents to be inspected would include: pre-start and inspection reports; machinery manuals; maintenance reports; supervisor reports and all procedures associated with the machinery.

Aspects to be covered by the investigation would include:

(a) Site and environmental considerations

- Location and surrounds
- Whether other equipment was involved
- Physical evidence eg. marks on ground, walls
- Whether the site conditions were appropriate for the use of the machinery, Clause 45
- Environmental conditions. Whether the atmosphere was in a fit state for walking and passing Clause 38, whether lighting was adequate, Clause 45.

(b) Mechanical aspects

- Any machinery damage
- What was the condition of machinery for use. Clause 71, requires that machinery must be designed, used, maintained, repaired and replaced so as to protect the safety and health of persons
- Whether the machinery was kept in a fit state for use, Clause 72
- Whether any modifications, alterations and repairs carried out to the machinery did not reduce its safety, Clause 74

(c) Human aspects

- Whether all persons involved have the necessary skills and competence, have been adequately trained and understand their duties, Clause 12
- Whether the persons were complying with the safe work procedures, Clause 14.
- Whether the operator carried out pre-start checks and careful examination of the workplace, Clause 14.
- Where the operator found any dangers and took appropriate action, Clause 14
- Whether adequate supervision was provided, Clause 12.
- Whether all people concerned were fit for work, with respect to alcohol, drugs and fatigue, Clause 31.

(d) System aspects

- Safe work procedures have been prepared as a result of a risk assessment, involving all persons concerned, Clause 19.
- Safe work procedures are incorporated in Mine Safety Management Plan and relevant people trained, Clause 9.
- Regular planned inspections are carried out, Clause 24

Determination of Controls

With the determination of the controls, all persons involved would be consulted, and the order of priority in controlling risks would be applied, Clause 19.

Implementation of Controls

- This would involve a review of the safe work procedures for the operation of the machinery and all other related procedures ie. maintenance, inspections, pre-start checks. The Mine Safety Management Plan would be appropriately reviewed and amended, Clause 9.
- Review of the Mine Safety Management Plan would also include appropriate revisions of document control, Clause 6.
- Appropriate training programs would be amended, and all persons appropriately re-trained, Clause 12
- A system to assess and monitor the changes would be implemented, to assess effectiveness, Clause 24.

Question 15 *2002 - Above Ground*

You are newly appointed production manager of an above ground mine and you receive a report from employees that they are concerned about excessive corrosion of the structural members of the gantry, supporting the conveyor of the elevated radial stacker. The assembly is very high off the ground and the employees are expressing concern about whether it is safe to walk out along it while it is operating. They advise that this section of plant is in excess of 30 years old and raise concerns about the possibility of it collapsing. The stacker is a vital section of your primary crushing circuit and cannot be bypassed without stopping production. Describe the actions you would take following receipt of the report. In your answer make reference to the various clauses of the General Rule that apply.

Answer

With this question the main issues to address are:

It is a requirement of Clause 29 to respond to any safety report made by an employee. The General Manager must take proper action to investigate and report back to the person making the report.

In the first instance the plant would be stopped and an investigation made by the production manager with the employee making the report and all other relevant people, such as the supervisor and maintenance staff. The production manager would consult with the general manager of the outcomes of the investigation.

Should the corrosion appear serious, a structural engineer would be engaged immediately to provide expert advice.

The area would be cordoned off and signs put in place to ensure no one went into the area of the radial stacker, clause 12. The general manager must ensure that any part of the mine that is unsafe is sealed off or closed to entry.

Section 46 of the Act requires that all risks to employees are identified and managed. This requires either the elimination of the risk or the controlling of the risk, to the fullest possible extent.

Clause 19 requires risk assessment strategies to be in place for dealing with hazards. It requires either the risk to be eliminated or controlled to the fullest possible extent.

Clause 19 also sets out the order of priority for dealing with risks by either:

- elimination
- control of the risk at source

- minimising the risk by means that include safe work procedures
- provision of personal protective equipment

Clause 19 also specifically requires that all persons who may be subject to the risk, be involved in any risk assessment and determination of control measures.

The structural engineer would be asked to provide advice on the following:

1. the extent of the corrosion and the risk involved
2. whether temporary repairs can be carried out, so as the plant can be continued to be used
3. what permanent repairs or replacements need to be made

If it is recommended that repairs can be made and the plant can continued to be used, the repairs must be designed and implemented by competent person and must be as functionally efficient and strong as they were before the failure or damage, Clause 74. Repairs can only be made if safe to do so.

It would be necessary to conduct a risk assessment to ensure the repairs are carried out safely, involving the people who are to carry out the work.

If this work was to involve contractors, the contractors would need to be involved in the risk assessment, a requirement of Clause 11 (Management of Contractors). The contractors would also have to have a safety management plan approved by the general manager or work under the mine's safety management plan, Clause 11.

If repairs cannot be made and it is necessary to replace part or all of the radial stacker, a design would have to be made by a qualified engineer. This is a requirement of Clause 74.

A risk assessment is required of how the work is to be carried out.

Investigations could take place as alternate means of production while remedial work is undertaken. This could involve the hiring of a portable crusher and conveyors. Should this happen, Clause 12 would apply for the management of contractors and Clauses 71 to 74 for the safe operation of the mobile plant.

During the construction works adequate supervision would be provided by competent trained persons in accordance with Clause 48.

Finally before any work is commenced all employees would be consulted (clause 29). Also the general manager would inform them of the decisions made and final proposals.

Question 16 *2002 Above Ground*

Dust has been identified as a major hazard at your mine because of the high free silica content of the rock you are mining. With reference to the various requirements of the General Rule for the management of dust, explain how you would prepare and implement a dust management program for your mine as part of your mine safety management plan.

Answer

A discussion should be provided by the candidate of how they would develop a Dust Control program as part of their Mine Safety Management Plan. This would include incorporating the following points:

Clause 20 requires a hazard management procedure for any major hazard to ensure adequate procedures are put in place to eliminate the risk or minimise to its fullest extent that is reasonable possible.

Clause 38 requires that the general manager must ensure by risk assessment the atmosphere is in a fit state for working or passing and doesn't endanger the safety and health of any persons. When monitoring the atmosphere the method used must comply with the codes or practice or guidelines approved by the Minister.

In order to conduct a risk assessment of the hazards posed by the free silica content in the rock it would be necessary to carry out a personal dust monitoring survey of all work places at the mine. This should be carried out in accordance with the guidelines and Australian Standards for dust monitoring.

Examine the result to identify whether there are any problem areas. Use the limits set in guidelines of 5 mg/ cubic metre of air for respirable dust and 0.2 mg/ cubic metre of air for silica content. Should the results identify any problem areas, carry out a risk assessment to determine the most appropriate controls. Clause 19 sets out the order of priority for dealing with risks.

Implement controls and then re-monitor to gauge effectiveness of controls. Make further improvements as required.

Undertake immediate health surveillance of all employees ensuring lungs tested. (Clause 33). Review results to determine if anyone has problem. Take appropriate action if persons identified with problems. This would vary from a change of jobs to a referral to a specialist or Dust Diseases Board.

The dust control program will include:

- airconditioned cabin on drilling rill. Regularly change dust filters.
- All mobile equipment to have enclosed airconditioned cabins.
- Crushing and screening plant to have water suppression and enclosed secondary circuit.
- Dust extraction system implemented
- All roadways to be regularly watered.
- Regular monitoring of dust.
- Use of dust masks if required. Last priority.

Include all of the above in the dust control program as part of the Mine Safety Management Plan (Clause 9) and consult with employees in the process. Provide necessary training.

Review program on regular basis, Clause 9.

Question 15 *2005 Above Ground*

You have just had a significant fall of ground from the eastern wall of the open cut onto the haul road and you have heard that the haulage truck drivers are worried about their safety.

Explain the action you would take to address all of your obligations under the Mines Inspection Act and General Rule?

Answer: **1. Remove all persons from danger**

As production manager I would take immediate action to stop all haulage on the haul road under the eastern wall were the fall of ground has occurred. This would include erecting barriers to prevent access on the road..

If there is no other access into the open cut and there are still employees at the bottom of the open cut I would have to initiate my emergency procedures required

under **Clause 21** of the General Rule. I would have an evacuation plan to get these employees out of the pit.

If there was an alternate haul road it may be possible to continue production away from the eastern wall, providing there was no danger of people being stuck by a further fall from the eastern wall.

2. Report incident

This fall of ground must be classified as a Dangerous Incident under the definitions in the Act, as it would have the potential to cause loss of life to a number of persons, should there be another fall. Under **Section 47** of the Act I have an obligation for my general manager to report the incident to an inspector or mine safety officer immediately and to give written notice within 24 hours.

3. Investigate fall

I would immediately contact the person who is responsible for the design of the open cut, who would most likely be a mining engineer or geomechanic engineer or geologist. Such a qualified and skilled person is required to be engaged under **Clause 46** of the General Rule. This person may be on the staff at the mine or may be a consultant who may have to travel to the mine.

Depending on access to the fall area, it may be necessary to hire a large crane to be brought on site with a basket attachment to be lowered over the face to carry out an inspection. This would be preferable to be lowered down from above the suspect ground as opposed to being raised in say an elevated platform from below.

When the engineer arrived on site I would accompany him on an inspection of the face. I would also take with me the mines inspector and the check inspector or employee representative, as a requirement of **Section 47B** of the Act.

4. Remedial Action Plan

It may take some time for a decision to be made as to whether the face is safe after the fall; whether remedial work has to be done to make it safe or whether more drastic measure have to be taken such as removal of overburden and battering back the slope of the eastern wall. This may be a major capital expense.

There may also be other alternatives such as the building another haul route in another part of the pit and leave the eastern wall undisturbed, providing it can be proven that any further fall of ground will not be a risk to any person.

Remedial work they may be able to be carried out may include: scaling, shotcreting or installation of rock bolts or steel cable supports. If such work is to be undertaken a risk assessment would be carried out involving employee representatives.

I would build a risk assessment in the decision making process to decide what action to take and include employees and representatives of the haul truck drivers. Under **Section 46** of the Act you are required to identify and assess any foreseeable risk to the safety or health of persons at the mine. Any such risks to be eliminated to the fullest extent or controlled under **Clause 19** of the General Rule. Under this section you are required to involve any people who may be affected by the risk in the risk assessment process. Also to give proper feed back of the outcome to the people concerned.

Also under **Clause 29** of the General Rule you must give proper attention to any safety or health matter brought to you attention from your employees.

Employees also have the right under **Clause 14 (Responsibilities of Workers)** if they find danger in an affected area to suspend work until the danger is removed. So they would have had the right to stop work, had I not have taken immediate action.

5. Monitoring program

A monitoring program would be included in any remedial action plan to check the ongoing stability of the eastern wall. This would be designed by the competent engineer as required under Clause 46, as a minimum this would include regular inspections by the engineer. Clause 24 also requires planned regular inspection by competent people.

Question 15 *2005 Below Ground*

You are production manager of a one million tonne per annum underground copper mine and are having problems with your main orepass which is hanging up and making water. As you are concerned about the safety of the people working on the lower level at the bottom of the orepass, explain the action you would take to ensure their safety. Although you are not sure where the water is coming from you suspect it is either from the old working above your current workings or from the hydraulic filling of your stopes. In your answer refer to the various sections of the Mines Inspection Act and General Rule that you would need to address.

Answer:

1. This is a very dangerous situation with a hung orepass holding water. It has the potential to cause a sudden mud rush out of the bottom of the pass causing damage to equipment and persons in its path.
2. I would classify the situation as a dangerous incident, as defined by the Definitions of the Act, with the potential to cause loss of life to a number of persons. As such I would immediately **notify an inspector or mine safety officer** as per **Section 47 of the Act**.
3. On knowledge of the situation immediate action would be taken to remove those persons on the lower level below the pass from danger. Either moving them well away from the pass or to a higher level in the mine. In doing this it may be necessary to implement the evacuation procedure which would be part of your emergency procedures a requirement of **Clause 21 "Planning for Emergencies"**.
4. Action should also be taken to stop loading operations into the pass.
5. It would be necessary to conduct risk assessment of the situation to determine all of the hazards involved with the situation and determine the level of risk and the controls required. **Section 46 MIAAct** requires any foreseeable risk to be eliminated or minimised to fullest extent. **Clause 19 GRule** requires that in assessing the risks:
 6. regard must be given to any guidelines approved by the Minister for guidance on the matter
 7. dealing with the risk in an order of priority
 8. involve affected employees in the risk assessment
9. Action should also be taken to see if the water flowing into the orepass can be stopped. If it is flowing in at the top it may be possible to be divert the water. If the water is flowing from hydraulic filling of stopes immediate action should be taken to divert this water or stop filling if required.
10. Action should be taken to measure the depth of water in the orepass and if necessary lower a submersible pump and pump the water out of the pass.
11. Action should be taken to determine why the ore pass is hung and what can be done to unblock it. This would require a risk assessment in itself. As it would be unsafe to attempt to shoot charges of explosives up under the hung rock in the pass from below, to bring it down. It may be possible to drill boreholes into the pass from other locations above and set charges in the boreholes. It would be expected that the water would flow through the rock in the pass and assist in it running.
12. It would be preferable to get the pass to run before studying where the water is entering the pass, if it is entering inside the pass.
13. The issue that the water may be coming from old working above the current mine workings is of grave concern. In this respect attention should be paid to the requirements of **Clause 47 of the General Rule with respect to Assessment and control risk of inrush.**

In this respect the whole situation of a possible inrush of water from the old workings should be assessed to determine the likelihood and severity of such an occurrence. A re-examination should be made to the accuracy of the plans of the old working and the strength of the ground between the workings and the possibility of accumulation of water in the old workings.

In carrying out this assessment consideration be given to the requirements of Clause 47 as follows:

- Competent surveyors are used to assess plans and prepare new plans if necessary. Research old plans and obtain information of the location of the old working to current workings.
 - exploratory bore holes are drilled if necessary to determine relation of the new workings to the old workings. Consideration be given to other equivalent methods such as radar, if applicable
 - monitoring equipment is installed in the current workings if possible to warn of the possible inflow of water.
 - People who are working in the mine who may be subject to any inrush of water are to be adequately informed of the critical factors involved in the risk assessment and of the appropriate action that must be taken in the event of an inrush or the appropriate action to review the risk assessment in the event of an inrush.
14. If the orepass can be unblocked the orepass should be inspected by remote camera or some other means to determine where the water is entering the pass and also to identify why the pass is hanging up.
15. A review could be made of the size of rock that is being loaded into the orepass. If large rocks are being loaded into the pass either secondary breaking or a rock breaker installed.
16. A review should carried out of the procedures for the management of orepasses to ensure water is not allowed to flow into them. This should be a **major hazard management plan** as required by **Clause 20** of the General Rule and become part of the **Mine Safety Management Plan Clause 9**.
17. All applicable underground employees should be retrained in the procedures. **Clause 12, General Rule** “the general manager must ensure that all employees are adequately and appropriately trained”.
18. A review should be made to ensure that the operation of the orepasses at the mine are adequately supervised, and that the supervisors are aware of the revised procedures. **Clause 13, supervisors** must ensure that any hazards with there area are detected and controlled.
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17.2 SAMPLE QUESTIONS AND ANSWERS – ORAL SECTION

PURPOSE The oral examination is an assessment of a candidate's abilities to manage the safety and health of all persons in a mine under their charge. The questions asked are practical in nature and are aimed at testing a candidate's practical experience, management capability and capacity to respond positively under pressure.

The mining industry, if not managed correctly can be a hazardous industry. Managers must be able to plan for and react appropriately to dangerous situations and emergencies where people's lives are at stake. Their first and utmost concern must be for the safety and health of their employees.

The examining panel is not looking for learnt answers but rather a candidate's ability to think and respond to a particular situation.

Although the oral examination focuses more on practical situations, candidates in their answers should be very aware of their legislative obligations.

SAMPLE QUESTION 1

You are sitting in your mine manager's office when you receive a telephone call from one of your plant operators. The operator tells you that the maintenance fitter who was working on the conveyor system that feeds the sand storage bin, has fallen into the bin and is almost fully submerged, screaming out for help. As nominated production manager of the mine what action would you take?

SAMPLE ANSWER

Key points to mention:

- You need to take immediate action to save the employee by ensuring the bin is immediately isolated so that nothing else is tipped into it or nothing is drawn out of it. Describe how you would do this as a matter of urgency, either telling the person who rang you to do it, the control room operator or doing it yourself. Make sure physical barriers are put in place.
- You need to be able to assess the situation to decide what needs to be done to rescue the person, you may be able to get more information from the person that rings you or it may be just as quick to go look yourself. In which case tell the person you are on your way and what you want him to do.
- Quickly advise your controller of the situation and to implement your emergency procedures to get your own rescue team to the site and for controller to stand by for further advice
- When at site, speak with person in bin if possible, to calm him down. Assess situation as to whether person is in immediate danger of being buried or suffocated and decide what action needs to be taken:
 - Is he injured?
 - Can he be lowered a rope, without danger?
 - Is he's arms free?
 - Will he need to be dug out?
 - Can one of your rescue people be lowered into bin to get a better look?
 - Should you immediately call your emergency provider eg, SES
 - Ensure security above person so nothing is dropped on him
 - Is external lighting required
- Discuss how you would carry out the rescue
- Discuss emergency procedures you have in place, what is required for this emergency and what improvements can be made
- Ensure all aspects of the emergency protocol are happening:

- medical preparation and transport
- family notification if appropriate
- reporting requirements
- other employees

17.3 PREVIOUS ABOVE GROUND ORAL EXAMINATION QUESTIONS

QUESTION 1 As production manager of a large quarry you have just received a Safety Alert from the Department of Primary Industries about a truck driver who was fatally injured at a quarry, when the truck he was driving failed to negotiate a corner and rolled down an embankment. In the process the driver was thrown from the cabin and later examination found the cabin to be undamaged.

As you also use haul trucks on a reasonably steep terrain at your quarry explain the important issues that should be considered as a result of this Alert in a review of your driver training program.

QUESTION 2 Explain how you would address the safety issues associated with the joint operation of construction and dumping of product on a stockpile, while at the same time you are loading out from the stockpile to supply your customers.

QUESTION 3 You are production manager of an open cut mine that has as part of the processing plant a reclaim tunnel, approximately 50 metres in length, under one of the product stockpiles. As you need to carry out maintenance in the tunnel which will involve cutting and welding, describe the safety issues you should consider in carrying out this work.

QUESTION 4 You are production manager of an open pit operation and receive a call over the two way radio, from a dump truck driver that he thought he saw someone slumped over in the water at the pump in the western dam. Describe your initial response.