

**THE MINING QUALIFICATIONS BOARD**  
**THE EXAMINATION IN MINING LAW RELATING TO**  
**HEALTH AND SAFETY 2003**

**Wednesday, 12 June 2003 - 10.00am - 12.30am**

**SECTION A**

**(‘Open Book’) - Mining Legislation and its Application**

- ◆ **Candidates are allowed to use, for reference, any of the permitted books, copies of Acts, Regulations and Approved Codes of Practice - any of which may be annotated - to answer questions in this Section.**
  
- ◆ **This section carries 60 marks and comprises four (4) questions from which **TWO (2)** should be attempted. All questions carry equal marks.**
  
- ◆ **Candidates should note that in answering any question, reference to more than one set of Regulations and any associated ACOP is required.**
  
- ◆ **In order to pass the Examination, candidates are required to obtain not less than 50% of the marks in each of Section A and Section B.**

**Time Allowed: 2 hours 30 minutes**

## SECTION A

### QUESTION A1

In an intake airway of a coal mine a locomotive was pushing a single materials vehicle carrying scrap material alongside a stationary manriding conveyor belt installation, which was some 1500m long with the drive unit at the outbye end. The vehicle derailed opposite the conveyor drive and loop-take-up units and before the locomotive brought it to rest, several pieces of scrap material toppled over onto the conveyor belt and loop-take-up unit.

The vehicle was put back on the rail track, a defective track joint considered to be the cause of the derailment was repaired, and the scrap material was removed. The conveyor was restarted from the surface and after a short period, all persons left the incident site following the locomotive and vehicle outbye.

As the conveyor continued to run large amounts of smoke were seen at the return end of the conveyor, sited at the main gate junction of a working face, where one side of the conveyor belt was rubbing against the return end structure. A fire was also present and spreading in coal dust on the floor nearby and was progressing towards an area where barrels of mineral oil were being stored. The conveyor belt was stopped and the fire was eventually extinguished by raking out and applying stone dust, although smoke continued for some time until supplies of water were delivered and applied to the site. Persons on the face and in the gate roadways detected the smoke and fumes, several wore their self-rescuers and all travelled outbye after all flames and smoke had been extinguished.

### **PART 1**

**In answering the following questions:-**

- state precise statutory references to **Regulations** quoted
  - **précis** the main points of the **Regulations** used
  - state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
  - **précis** the content of the **ACOP** paragraph used
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- i) Which of the above incidents are required, by **Regulations**, to be notified to an enforcing authority and how should this be done?
  - ii) Which **Regulation** requires exemption granted by the Chief Inspector of Mines to allow the pushing of a vehicle by a locomotive, except during shunting operations?
  - iii) **Regulations** and **ACOPs** cover the safe installation and inspection of plant and equipment. According to **ACOPs**, what must the manager ensure regarding the persons involved following the derailment of the vehicle and if any defects are found?

- iv) What do **Regulations** state about the duties of a person in charge of part of a mine when there is a fire or suspected outbreak of fire and what parts shall be deemed to be affected if fire has broken out?
- v) According to **ACOPs** only, what should be taken into account in any assessment of risk:-
  - a) in any plan to allow for the safe evacuation and rescue of persons?
  - b) in the risk of a fire or explosion occurring?
  - c) of the resulting risks to persons?
- vi) What do **Regulations** require regarding the document which refers to “design, use and maintenance of” equipment with respect to fires?

## **PART 2**

**No reference to any legislation is required in this part.**

- vii) Briefly describe the safety monitoring that could be provided on a modern conveyor belt installation and in mine roadways to prevent and detect fires or smoke arising from operating the conveyor belt.

## **QUESTION A2**

Two craftsmen electricians are deployed to carry out planned maintenance examinations in an outbye sub-station. The planned examinations require that internal examinations be carried out on a set of 1100 volt gate-end-boxes used to supply an outbye conveyor.

Arriving at the substation the two craftsmen decide to isolate the equipment to be examined and proceed to identify the circuit breaker to carry out the isolation. Finding no circuit breaker they decide to isolate the power at the transformer used to provide the necessary 1100 volt power supply to the switchgear, which was located through a set of ventilation doors some 200 metres away. Both outlets of the transformer were in use and having tripped the transformer HT breaker they found that they were unable to fit the necessary padlocks since the mechanism had been damaged.

They had completed the scheduled examinations and were in the process of tidying up their tools and equipment when the lights in the substation were lit momentarily and a loud bang and coincidental flash occurred.

During his normal inspections, the deputy had found the auxiliary fan, which was used to ventilate a short drivage tunnel being constructed for a new bunker installation, was not running. He checked the gate end box and, finding no power, he proceeded to the local transformer where he found the transformer switched off at the HT switch. Finding nothing to indicate any reason for the transformer to be isolated he decided to switch the power on, at which time the breaker immediately tripped.

Subsequent investigation revealed that a test lead had been left connected across two phases of the 1100-volt power supply resulting in a short circuit inside the gate end box. Due to a fault in the transformer circuit breaker, the short circuit had persisted for longer than expected resulting in significant damage to the equipment. The electricians had completed their examination sheets with the only reported defect being the absence of a suitable electric shock notice.

The manager reasoned that the incident was not reportable under RIDDOR and the circumstances were published as a near miss.

### **In answering the following questions:**

- state precise statutory references to **Acts and Regulations** quoted
  - précis the main points of the **Acts and Regulations** used
  - state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
  - précis the content of the **ACOP** paragraph used
- i) Outline ten (10) provisions of **Acts** and/or **Regulations**, which may have been contravened in this incident.
  - ii) Identify an **ACOP** to support each of the **Regulations** described in your answers for i).

iii) Indicate whether you agree with the decision of the Manager not to report the incident as a dangerous occurrence under **RIDDOR**. Indicate the factors you would consider in this case when making your decision. **No references to any legislation is required in your answer to this part of the question.**

### **QUESTION A3**

At a coal mine, it is planned to develop access into a new area of reserves in the existing working seam. This development is planned to include the use of the roadways of a previously worked longwall advancing face. These run from the edge of the shaft pillar to the boundary of the new area forming single intake and return for the new area. As part of the plans, it has been decided to install, for the first time at this mine, a locomotive haulage system for man-riding along the original intake gate road. This roadway, which extends a distance of 2500 metres in a straight line without curves, and is level throughout, requires to be enlarged throughout its length to accommodate the system.

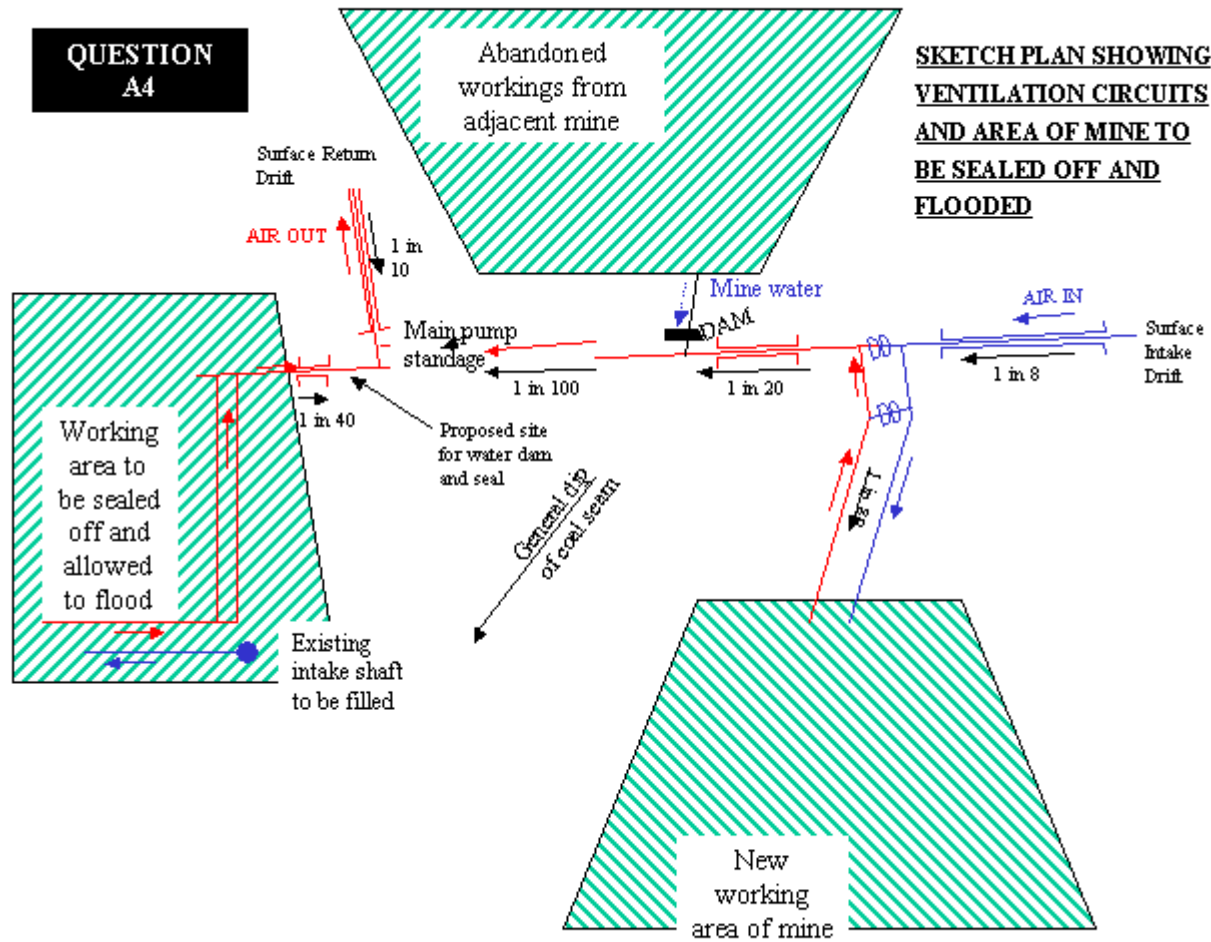
The manager holds a meeting with his staff to consider the various requirements of **Acts, Regulations and Approved Codes of Practice (ACOP's)** that will need to be taken into account when establishing this system.

#### **Questions**

In answering the following questions:-

- state precise statutory references to **Acts and Regulations** quoted
  - précis the main points of the **Acts and Regulations** used
  - state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
  - précis the content of the **ACOP** paragraph used
- i) **Regulations** specify the manager's duty with respect to the assessment of ground control measures to be applied during the enlargement of the intake roadway. What should the manager ensure?
  - ii) What does an **ACOP** state about the content of this assessment of ground conditions?
  - iii) What does an **Act** state about the involvement of HSE Inspectors with the introduction of locomotives in this mine?
  - iv) The manager is required to prepare transport rules for this system. What does an **Act** state should be included within these rules?
  - v) What do **Regulations** specify with regard to the following items for this locomotive system?
    - a) track standards
    - b) clearances
    - c) the provision of refuge holes
    - d) communications along the roadway.
  - vi) What do **Regulations and an ACOP** state about fire prevention and the provision of fire fighting equipment in this roadway?

**QUESTION A4**



A large underground coal mine has recently commenced working a section of newly accessed reserves situated closer to the surface conveyor drift bottom. This surface drift also serves as the main intake airway into the mine. Two roadways had been driven down to the new reserve area, one to serve as the intake airway conveyor roadway, the other as the return airway haulage roadway. The return airway from this new area consists of the recently driven single roadway only, which in turn is connected with older workings which serve as the main return airway to the surface fan cross-measure drift, some 5km from the current working area. A roadway connecting to a previously abandoned mine allows minewater from that adjacent mine workings to be controlled by the dam shown on the plan.

With all production now concentrated in this newly accessed area, and there being no prospect of mining coal in the older sections of the mine, the decision was made to isolate the old working area by the construction of a substantial water dam which will also seal the old working area from the return airway. Minewater making from these old workings and that from the previously closed mine adjoining is recognised as a problem that would be controlled by utilising the existing pump standage. This is situated near to the bottom of the return airway drift to the surface and is a natural low point in the mineworkings in that area of the mine. In formulating the minewater management and pumping plan, it was acknowledged that minewater behind the proposed new dam, to be constructed at the site shown on the Plan, would be allowed to rise substantially above the return airway levels, and this dam would require to be of adequate construction to support this pressure.

**In answering the following questions:-**

- state precise statutory references to **Acts and Regulations** quoted
  - **précis** the main points of the **Acts and Regulations** used
  - state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
  - **précis** the content of the **ACOP** paragraph used
- i) When preparing to seal off old workings, **Regulations** impose duties on three (3) key persons at the mine.
- a) Who are these persons?
  - b) Identifying the particular **Regulation**, describe a duty each of these persons has relevant to the planning for abandonment of the old workings as described. Support your answer for the person with reference to one **ACOP** appropriate for each.
- ii) **Regulations and ACOPs** require that working plans and ventilation plans must be prepared for the mine.
- a) What do **Regulations and associated ACOPs** state about the “provision of accurate information”?
  - b) What do **Regulations** supported by an **ACOP** state in reference to a plan showing the system of ventilation at the mine?

- c) Making reference to **ACOPs** only, briefly describe three (3) specific items or features that must be included on any plan designed to present information regarding a potential water inrush situation?
- iii) Which **Regulation** requires the Manager to prepare a “scheme of work” if he is of the opinion that a potential inrush situation could be created at the mine?
- iv) An **ACOP** specifically refers to the preparation of a “scheme of work” which would be suitable for the circumstances at this mine. Identify and briefly describe the **ACOP**.
- v)
  - (a) What does a **Regulation** state about the particular circumstances which exist at the mine in relation to the single main intake airway into the newly accessed current workings?
  - (b) Identify and briefly describe the **ACOP** which provides guidance which, if followed, enables it to continue working with a single intake airway only into the working district.
- vi)
  - (a) What do **Regulations** state regarding the provision, position and construction of doors in connections between a main intake and a main return?
  - (b) What is the meaning assigned by a **Regulation** to a “main return airway”?
- vii) List three of the factors the mine manager should consider for the long term stability of the dams when selecting the site of a proposed dam. **No reference to any legislation is required in your answer to this part of the question.**

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HEALTH AND SAFETY 2003**

**Wednesday, 12 June 2003 - 2.00pm - 3.30pm**

**SECTION B**

**(Closed Book) - 'Mining Legislation'**

- ◆ **CANDIDATES ARE NOT PERMITTED TO USE ANY BOOKS OR NOTES IN ANSWERING THIS SECTION.**
- ◆ This Section carries 40 marks and comprises six questions from which **FOUR (4)** should be attempted.
- ◆ **In answering this Section, no reference from the content of any Approved Codes of Practice (ACOPs) is required.**
- ◆ In order to pass the Examination, candidates are required to obtain not less than 50% of the marks in each of Section A and Section B.

**Time Allowed: 1 hour 30 minutes**

## **QUESTION B1**

The **Use of Electricity in Mines, Electricity at Work Regulations 1989** contains provisions that apply to mines only and includes restriction of equipment in certain zones below ground.

i Identify the electrical equipment that may be energised in zones where firedamp in sufficient quantities, to indicate danger, is likely to occur?

Additionally, **Regulations** include a provision for **records and information**.

ii Identify each of the specific requirements associated with records and information.

## QUESTION B2

**The Coal and Other Mines (Locomotives) Regulations 1956** refers to ventilation and working and maintenance of locomotives.

- i Under the sub-paragraph **Records of determinations**, what are **persons** required to do if a determination of firedamp content (not being a determination made by analysis of a sample of air) exceeds 1.25% by volume in any length of road a locomotive runs?
  
- ii Under the sub-paragraph **Maintenance of locomotives**, what must be included in the scheme for the examination and testing of every locomotive?

### **QUESTION B3**

**The Mines (Control of Ground Movement) Regulations 1999** set out requirements with respect to significant changes to ground control measures.

- i What actions are required of the manager when he intends to make a significant change to existing ground control measures at a mine?
- ii What represents a significant change?
- iii What circumstances do the **Regulations** specifically exclude from the definition of a significant change?
- iv In what way do these **Regulations** allow an immediate implementation of a significant change?

The **Schedule to these Regulations** specifies support system standards for roadways. From these standards, state the following:-

- v the minimum density of rockbolts in the roof when they are used as principal support
- vi the minimum length of rockbolt in the roof when they are used as principal support
- vii the maximum distance between the last arch before the face and the face of a roadway when steel arches are used as principal support
- viii in the case of roadways where machines are used to cut and simultaneously load, the maximum advance per cycle of any such machine

These **Regulations** require an official to take certain steps where it appears to him that any fall of roof or side, at any place where people work or pass in the mine, has made that place unstable.

- ix What are these steps?

QUESTION B4

**The Mines Miscellaneous Health and Safety Provisions Regulations 1995 requires the owner of a mine to ensure that a Health and Safety Document has been prepared for his mine.**

- i What two factors must the document demonstrate?
- ii Where appropriate, this document should include four specific plans. What is the subject matter detailed in these plans?

## **QUESTION B5**

Part 1 of **The Health and Safety at Work etc Act 1974** refers to the use of Approved Codes of Practice in criminal proceedings, improvement notices and prohibition notices.

- i        What is the legal status of the provisions of any Approved Code of Practice?
  
- ii       What opinion(s) must an inspector, appointed under **Section 19** of the above **Act**, arrive at before issuing to a person:-
  - a)       an improvement notice?
  
  - b)       a prohibition notice?

## **QUESTION B6**

**The Management and Administration of Safety and Health at Mines Regulations 1993** require the owner and manager of a mine to establish a management structure that is suitable for the mine.

- i        What shall this management structure define?
- ii       What shall the owner and manager ensure with respect to this structure?
- iii      What particular features of supervision over persons at the mine shall be the duty of the Manager?
- iv       What do these Regulations require of every person in the management structure?

The above **Regulations** also specify the duties and responsibilities of the manager with respect to plant and equipment.

- v        What are these duties and responsibilities?