

**THE EXAMINATION IN MINING LAW RELATING TO
HEALTH AND SAFETY 2005**

Wednesday, 15 June 2005

SAMPLE ANSWERS

INSTITUTE OF MATERIALS, MINERALS & MINING

SAMPLE ANSWERS

QUESTION A1

i Mines Miscellaneous Health & Safety Provisions Regulations 1995

a)

Reg 4(1)(a) Health & Safety Document

b)

Reg 4(1)(a) Health & safety Document demonstrates that risks to which persons at work at the mine are exposed have been assessed in accordance with Reg 3, 1992 Regulations.

Reg 4(1)(b) demonstrates that adequate measures including design, use and maintenance of the mine and its equipment have been, and will continue to be taken to safeguard the health and safety of persons at work

c)

Reg 4(2) Document should include:-
a) a plan detailing equipment and measures required to protect persons at work from the risk of explosions
c) where toxic gases are or may be present in the atmosphere in such concentration that atmosphere may be harmful, a plan detailing the protective equipment and measures required to protect persons

ii Safety of Exit Regulations 1988

Reg 9(6) Manager to ensure not more than 50 persons employed in any part of the mine unless:-
there is one intake airway which is constructed of suitable fire resistant materials and free, so far as is reasonably practicable from the risk of fire.

ACOP 38

Where the alternative of a single intake freed from the risk of fire is used, the following precautions should be taken:-

- a) use of equipment/materials which are non-flammable or fire resistant
- b) use of fire resistant supports and belting
- c) use of fire resistant doors
- d) suitable and sufficient means of extinguishing a fire
- e) use of automatic fire detectors

iii RIDDOR 1995

There were four possible Dangerous Occurrences associated with the incident.

Section 22 Ignition of any gas

Section 25 An incident where any person has been caused to leave any place pursuant to either Reg 11(1) Fire & Rescue Regulations 1956, or Section 79, Mines & Quarries Act 1954.

Section 33 a) Self rescuer, while being used failed to function safely or develops a defect likely to affect its safe working
b) Immediately after using a self rescuer any person receives first aid

iv Safety of Exit from Mines Regulations 1988

Reg 7(2) Manager ensures that each way which leads to a shaft is clearly marked

Reg 7(3) Manager operates a scheme to familiarise each person with at least 2 ways out of the mine

ACOP 27

The Manager should ensure that each junction along the way and the direction of the shaft or outlet to which the way leads is clearly marked

ACOP 28

Manager's scheme should set out the arrangements to ensure persons are familiar with the ways out from their place of work

v Escape & Rescue Regulations 1995

a)

Reg 19(1)(a) Owner shall provide suitable self rescuers for all persons going below ground

b)

ACOP 49

The selection of self rescuers take account of results of risk assessment. Aim is to select type to ensure persons are protected while they escape. Factors taken into account are:

- a) presence of substance which might give toxic fumes
- b) ventilation system in the mine – speed of spread of products of combustion
- c) life of self rescuer
- d) time needed for rescue services to arrive at the mine

c)

Reg 10(3)

Person provided with a self rescuer shall keep it with him and available for use.

ACOP 55

Everyone should, where practicable, carry their self rescuer on their person at all times

vi MASHAM Regulations 1993

Reg 13(2)

Manager to make suitable arrangements so that:-

- a) the barometric pressure is measured at the start of every shift and the trend is noted
- b) the measurement and trend are displayed to make people aware
- c) the reading and trend are brought to the attention of all persons who exercise supervision or inspection

ACOP 117

Necessary to be aware of changes in trends of barometric pressure because of their effects on the emission of mine gases. Trends must be brought to the attention of supervisors/inspectors. Where there is a particular problem associated with barometric trends, it is good practice to establish a system of advance warning.

SAMPLE ANSWERS

QUESTION A2

i

Mines (Shafts and Winding) Regulations 1993

- Reg 9 Manager shall ensure at each entrance a suitable barrier to ensure safety.
- ACOP 66 Barriers designed, constructed and maintained to prevent persons or objects falling into shaft or contacting winding apparatus
- Reg 10 Owner shall ensure winder has effective brake interlocking devices
- ACOP 84 Brake locking to be interlocked with shaft side equipment and prevent winding if:-
(a) any shaftside barrier or gate is not fully closed
- Reg 11(2) When winding apparatus is modified competent persons shall examine all aspects and report (report not written)
- Reg 11(4) Manager to ensure that after modification winder is not used unless the report mentioned in Reg 11(2) states that the apparatus is safe to use
- Reg 13(2) Owner shall specify the maximum winding rope life (not the manager)
- ACOP 129 Unless directions given by an inspector, rope life shall not exceed
(b) two years as winding ropes on friction winders
- Reg 17(1) Manager shall ensure winding apparatus is regularly, adequately, examined, inspected, tested and maintained (brake lock system was defective)
- ACOP 188 All external parts of winding apparatus used for carrying persons should be inspected at least once in every 24 hours to ascertain its condition and safety

Management and Administration of Safety and Health at Mines Regulations 1993

- Reg 5(3) Where employee discovers a danger has arisen or about to arise, he shall:-
take immediate steps to prevent danger and
report matter to person in management structure
(onsetter apparently did neither)

Reg 6(2)(b)	Owner to ensure mine is managed and worked in accordance with statutory provisions
Reg 6(5)	The above applies whether or not they expressly impose duties on him or some other person
ACOP 27	Regulation 6 makes it clear that if a statutory provision is contravened (even if it is by a duty holder other than the owner) the owner is guilty of an offence, unless owner has proved that he used all due diligence to secure compliance
Reg 9(3)(a)	Duty of manager to manage and control undertaking of mine in accordance with relevant statutory provisions
ACOP 40	Manager has duty to ensure safety through his arrangements for supervision and inspection, and to ensure observance by others of the relevant legislation
Reg 11(1)(b)	Duty of manager to ensure that all plant and equipment is systematically, inspected, examined, tested and maintained
ACOP 89	Special circumstances apply to the installation of winding apparatus Commissioning should involve testing to ensure that the plant operates safely Audit of the safety parameters should be made annually or on recommissioning
Reg 23(a)	No person shall do any work unless received adequate training or is under supervision (onsetter not trained to operate a locomotive)
ACOP 135	No one may employ a person to work below ground at a mine, or to work in any job at the surface of the mine, unless the person has been trained to do that work and is competent to do it
Reg 36(2)(b)	Copies of all schemes and rules shall be posted in the covered accommodation

The Coal and Other Mines (Locomotive) Regulations 1956

Reg 24(2)	Scheme shall provide for examination and testing of brakes forthwith after any repair or adjustment
Reg 17(1)	No person shall operate any locomotive in any mine other than a person appointed by the manager
Reg 17(2)	Manager shall not appoint any person to be a driver unless that person holds a certificate that he is competent without supervision to operate a locomotive

Reg 18 No person operating a locomotive shall leave it unattended, otherwise than at the place normally kept when not in use, unless he has ensured that it cannot be set in motion by any person prohibited from operating it

Mines (General Duties and Conduct) Regulations 1956

Reg 6(1) No person shall interfere with any machinery capable of developing more than 7.5 kW, unless authorised by the manager

Mines (Safety of Exit) Regulations 1988

Reg 3(4) Where due to an accident, dangerous occurrence etc, one exit is available, the manager shall:-
Ensure scheme of action is brought into effect
Restrict number of persons below ground
Forthwith notify HSE by quickest practicable means
Post notice in covered accommodation

ACOP Manager's scheme to include
Suspension of all transport activities at remaining exit other than manriding or material necessary to restore other exit
Suspension of all operations except those for safety of mine and restoration of exit
Bringing into state of readiness the auxiliary equipment and procedures specified in the manager's rules

Health and Safety at Work Act 1974

Sec 2 (a) Employer to provide and maintain plant and systems of work that are, safe and without risks to health

Sec 7(a) Employee to take reasonable care for his and others Health and Safety who may be affected by his actions

Any 14 of the 21 Regulations shown could have been used

Any 6 of the 9 ACOPs shown could have been used

ii Ways of preventing a recurrence of the incident

- 1) Isolation/ lock-off procedures for locomotives when not in use
- 2) Procedures for brake testing of loco following repairs to brakes
- 3) Training of onsetters to re-emphasise their duties
- 4) Improving procedures and supervision to ensure all safety devices are operational before use of winding apparatus
- 5) Provision of automatic shaft side barriers
- 6) Provision of vehicle axle arrestors in front of shaft

SAMPLE ANSWERS

QUESTION A3

i

Mines and Quarries Act 1954

- Section 83 No locomotive shall be used underground otherwise than in accordance with Regulations or with the consent of an Inspector
- Section 40 Manager shall not allow vehicles to run in a roadway unless there are provided refuge holes of specified size and dimensions
- Section 39 Restrictions on persons passing on foot in roads in which vehicles move
Set times when regular pre and post shift travel can take place
- Section 37 Manager to have power to make transport rules specifying dimensions of road, maximum loads to be carried, maximum speeds, precautions when manriding is taking place

Mines (Safety of Exits) Regulations 1988

- Reg 7(2) Manager to ensure that each way which leads to a shaft is clearly marked

The Coal and Other Mines (Locomotive) Regulations 1956

- Reg 6(1) Manager shall ensure that locomotive runs on a track that is ballasted and drained
appropriate weight per meter
sleepers at 840mm centres
secured at joints by a four bolted fishplate
- Reg 6(3) Clearances on adjacent tracks of loop of 300mm
- Reg 7(1), (2), (3) Vertical clearance above cab 300mm
Horizontal clearance 600mm except where refuge holes are required

The Coal and Other Mines (Clearances in Travelling Roads) Regulations 1956

- Reg 4 These Regulations apply to enlarged roadways
- Reg 5 Manager to ensure the provision of continuous clear spaces between sides of road or supports and vehicles
vehicles on adjoining tracks
- Reg 6 Clearance at manriding station of 760mm to sides

The Coal and Other Mines (Shafts, Outlets and Roads) Regulations 1960

- Reg 59(2)(d) 90m spacing between refuge holes

Reg 59(5)	Dimensions of refuge hole – 1m wide, 1.2m deep, 1.8m high
Reg 59(8)	Marked with a distinct number, readily visible (with whitewash both inside and for 300mm surrounding) and kept clean
Reg 80(1)	Provision of effective telephonic communication at manriding station

Any 8 of the Act or Regulations shown could have been used

ii

The Mines and Quarries Act 1954

Section 59	Cannot use two roadways as intake and return unless there is no leakage between them or steps are taken to minimise leakage
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Mines (Safety of Exits) Regulations 1988

Reg 9(b)	Manager to ensure no more than 50 people are employed in a part of a mine served by one exit unless it is constructed from suitable fire resistant materials and is free from the risk of fire
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ACOP 38

Precautions in single intake to include non-flammable or fire resistant equipment and materials, fire resistant supports, fire resistant doors, suitable and sufficient fire extinguishers, automatic means to detect outbreak of fire

The Coal and Other Mines (Ventilation) Regulations 1956

Reg 9(1) and (2)(a)	Manager to ensure efficient arrangements to measure air quantity at every 30 days in every intake starting at the shaft
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The Coal and Other Mines (Locomotive) Regulations 1956

Regs 11, 12, 13 & 14	Rules for determination of firedamp content in roadways in which locomotives run
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Any of the above Act or Regulations could have been used

iii

The Mines (Control of Ground Movement) Regulations 1999

ACOP 6

Ground control measures include:-
Layout and dimensions, installation of support material

ACOP 13

Assessment might be based solely on previous knowledge and experience where passive, free-standing supports are used

ACOP 14	Assessment of ground conditions should take into account geology, mechanical rock properties, stressfield, extent and nature of ground movement to be controlled etc
ACOP 21	Design document to be prepared after assessment setting out ground control measures
ACOP 24	Design to include extraction dimensions, support density, support materials specification, method of work, abnormality procedures, information on proximity of other workings
ACOP 25	Likely ground stresses, ground movement, ventilation requirements and clearances are factors to be taken into account in the design
ACOP 27	Manager should ensure that rules include sufficient instruction and written material
ACOP 28	Rules to include diagrams and text showing stage by stage sequence of operations. Also layout, pattern and dimensions of ground control system and component specification
ACOP 46	Suitable rules should describe methodology. Use of temporary support or strata reinforcement is recommended

iv

The Coal and Other Mines (Ventilation) Regulations 1956

Reg 21(1)	Any old road not required between intake and return <u>shall be stopped off</u>
Reg 21(2)	Stopping construction, <u>tight packing, 5m thick</u> or, constructed of <u>tight packing, at least 3m thick</u> of <u>stone, dirt, sand or rubbish</u> with <u>intake end wall faced</u> with not less than <u>190mm thick</u> <u>masonry, brick or concrete</u> coated with <u>mortar</u>

SAMPLE ANSWERS

QUESTION A4

i Electricity at Work Regulations 1989 (2001 Edition)

- Reg 4(1) All systems shall at all times be of such construction as to prevent danger
- Reg 4
ACOP 21 The voltage levels chosen for systems should relate to established safe practice, the circumstances of use, the type of equipment and the protection provided
- ACOP 21(b)(i) Systems below ground supplying machines which are designed to be moved while working – at the coalface 3300 volts
- ACOP 21(b)(ii) At a coalface, for which “Managers Rules” have been drawn up covering pre-conditions for use – environmental monitoring and use of high voltage testing 3300 volts
- Reg 7 (b) All conductors in a system which may give rise to danger shall have such precautions taken in respect of them as will prevent, so far as is reasonably practicable, danger
- Reg 7
ACOP 11 Wherever cables are being utilised for the purpose of supplying 3300 volts to machinery, the moving cable shall be protected by a proprietary cable handling chain.
..... fixed parts of trailing cables shall be enclosed
- Reg 10 Where necessary to prevent danger, every joint and connection in a system shall be mechanically and electrically suitable for use
- Reg 10
ACOP 5 Plugs and sockets used below ground, operating above 1100 volts and served by a flexible trailing cable, should be of a bolted type to protect the equipment from interference by unauthorised persons
- Reg 18 Before electrical equipment is first introduced into any underground part of a safety lamp mine ... the manager shall submit a copy of the ventilation plan ...
- Reg 18
ACOP 1 The manager shall send the relevant information and plan to the inspector not less than 1 month before the introduction of electrical equipment
If the submission involves 3300 volts coalface equipment, sufficient details will need to be included to demonstrate that full and proper consideration has been given to safe use

The “perfect” answer would require reference to all of the above

ii Owner’s Operating Rules

- Reg 4 The owner’s operating rules shall relate to the subjects set out in the Schedule to these regulations
- Schedule
Reg 4 1(a) The owner’s operating rules shall relate to:
frictional ignition

iii Management of Health and Safety at Work Regulations 1999

- Reg 3 Every employer shall make a suitable and sufficient assessment of:
- Reg 3(1)(a) The risks to the health and safety of his employees to which they are exposed whilst they are at work
- Reg 3(1)(b) The risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking
- ACOP 9** Employers are required to assess the risks to workers to enable them to identify measures to comply with health & safety law ... record significant finding of the assessment
- ACOP 10** A risk assessment is carried out to identify risks ...
enable risks to be managed ...
Decisions made in an informed and structured manner
- A risk assessment should identify hazards
- ACOP 11(a)** A hazard is something with potential to cause harm
- ACOP 11(b)** A risk is the likelihood of potential harm from that hazard being realised factors will include likelihood, severity and affected population

iv Provision and Use of Work Equipment Regulations 1998

- Reg 11(1)(a) Every employer shall ensure that measures are taken to prevent access to any dangerous part of machinery ...
- Reg 11(2)(a) The measures required shall consist of provision of fixed guards to enclose dangerous parts to an extent that it is practicable to do so
- Reg 11(2)(b) the provision of other guards or protection devices to the extent that it is practicable to do so
- Reg 11(3) All guards and protection devices provided shall:-
a) be suitable for the purpose provided
b) be of good construction, sound material and adequate strength
c) be maintained in an efficient state
d) give rise to increased risk
e) not be easily bypassed or disabled
f) be situated at sufficient distance from the danger zone

v Owner's Operating Rules : Model Rules on Frictional Ignition

- Minimum air quantity and velocity at suitable locations
Use of portable AFDs at suitable places

Provision of devices to provide the stipulated minimum air flow in the cutting zone

Provision of interlock devices to stop the cutting element if the mine ventilation is not achieved

Type and location of local ventilation devices

Type of picks to be used

Provision of on-board fire fighting

Type and location of other devices used to dilute firedamp

Provision of equipment to cut off the supply of electricity if upstream CH₄ concentration exceeds 1.25%

Provision of plan showing the arrangements

Statement of operational precautions

Statement of duties of personnel appointed by the manager

Arrangements to move the machine to allow maintenance

Prohibition when rules are not complied with

Any 5 of these model rules would have been adequate