

# **Health and Safety Executive - HM Mines Inspectorate**

## **Major Hazard Topic Inspection Guide**

### **ESCAPE AND RESCUE ARRANGEMENTS AT MINES**

#### **1. Purpose**

This document sets out how inspectors will assess operators' compliance with the relevant statutory provisions in respect to the escape and rescue arrangements at mines.

Suitable arrangements must be in place so that persons below ground at a mine can either reach a safe place or safely evacuate the mine promptly in the event of an emergency. The arrangements must also include provision for the rescue of any persons who cannot escape by themselves. Events likely to trigger an evacuation and/or a need for rescue include:

- a fire
- an explosion
- a fall of ground (entrapment)
- an outburst or inrush
- failure of apparatus in shafts or un-walkable outlets, including loss of power.

#### **2. Scope**

The inspection will focus on ensuring that suitable arrangements are in place to achieve these requirements. The format of the inspection will follow the established Plan, Do, Check, Act structure, as defined in HS(G) 65 and summarised in HSE leaflet INDG 275.

The inspection will be undertaken in line with the HID Regulatory Model and will explore the following elements:

- has the mine operator identified and put into place suitable arrangements for escape and rescue at the mine?
- has the mine operator completed suitable and sufficient risk assessments?
- have roles and responsibilities been allocated for the control measures identified?
- is there a suitable competency management system in place relevant to the control measures?
- are the measures to control the major hazards being monitored?

#### **3. The intervention**

The intervention team can if necessary ask the mine operator to provide copies of documentation in advance of the site visit. The on-site part of this stage of the intervention could take a day or more depending on the scope. Once the documentation has been reviewed the intervention team will inspect and evaluate the effectiveness of the escape and rescue arrangements.

Inspectors should assess how well the mine operator is managing the escape & rescue arrangements, in particular the adequacy of the emergency plan.

Key areas that should be examined in determining the adequacy of the emergency plan include checking whether proper consideration has been given to:

- the type of incidents that could occur underground and where they might be in relation to the layout of the mine
- the communication systems required, their adequacy and the ways of raising the alarm following an incident

- who may be affected by the incident and the extent of the affected area
- how quickly smoke or other harmful substances may spread throughout the mine workings. The flow and direction of air travelling throughout the mine workings should also have been considered in some detail
- whether the main mine fan or underground fans need to be stopped in certain situations
- the location of designated places of safety
- the designated escape routes and length of those routes to places of safety
- the types of aids required to escape to safety for example, self-rescuers, self-rescuer exchange stations, smoke goggles, signage and lighting
- the provision of two means of egress from working places
- the provision of two means of exit from the mine to the surface
- the training and instruction in escape and rescue provided to persons employed below ground
- the number of people required for various rescue situations and where those people will come from
- the command and control during an emergency
- the suitability of plans to be used in an emergency, that they are up to date and readily available.

### ***Safe havens (if provided)***

Factors to consider in determining if a safe haven may be required, and if so where it should be located, include:

- the availability or otherwise of dual intake roadways
- ability to travel to fresh air from place of work
- heat and humidity
- escape route gradients

Access to safe havens should be clear and free from obstructions. They should be easy to locate and special measures taken to identify them when visibility is limited, for example by fluorescent way-finding roadway markers.

### ***Escape and Rescue Plan***

The Escape and Rescue Plan should include:

- an overview of the emergency arrangements
- the emergency management organisation
- the roles and responsibilities of the named persons who have duties in an emergency situation
- evacuation schemes for reasonably foreseeable emergency situations
- a system for alerting the mines rescue service provider and other essential personnel
- the pre-determined locations for emergency functions, eg incident control, the rescue room
- the location of a sufficient number of up to date mine plans on a suitable scale for use by rescuers
- a scheme for accounting for people below ground at the time an incident occurs
- a scheme for accounting for those going into the mine to assist in the evacuation or rescue operation
- the provision of emergency equipment and supplies
- details for maintaining an emergency logbook during an emergency.

#### 4. Reporting findings and conclusions

Inspectors will summarise the outcome of the inspection with the operator, management team and the safety representatives at the mine whilst on site.

This summary will include the team's assessment on how the operator is complying with the relevant provisions, priorities for any further action and the operator's performance score in accordance with the **Performance Assessment Table** shown below.

Where the risk ranking score is such that the team decides specific follow-up action is warranted they should outline the nature of that action and an approximate timescale over which they intend to conduct the follow-up.

#### 5. Key legislative requirements for mines

##### ***Health & Safety at Work etc. Act 1974***

Section 2(1), 3(1)

##### ***The Mines Regulations 2014***

Regulation 7 General duties of the mine operator

Regulation 8 Co-operation

Regulation 9 Health and Safety document

Regulation 10 Management structure

Regulation 11 Competence

Regulation 12 Instructions, rules and schemes

Regulation 15 Maintenance and inspection of equipment

Regulation 16 Records of persons below ground

Regulation 48 Exits from the mine

Regulation 49 Ways out from place of work

Regulation 50 Emergency route and emergency doors

Regulation 51 Auxiliary equipment

Regulation 52 Intake airways

Regulation 53 Duties of the mine operator with regard to escape and rescue

Regulation 54 Escape and rescue plan

Regulation 55 Emergency equipment and communication systems

Regulation 56 Training and information

Regulation 57 Self-rescuers

##### ***Management of Health & Safety at Work Regulations 1999***

Regulation 3 Risk assessment

Regulation 5 Health and safety arrangements

##### ***Provision and Use of Work Equipment 1998***

Regulation 4 Suitability of work equipment

Regulation 5 Maintenance

Regulation 6 Inspection

Regulation 12 Protection against specified hazards

### Performance Assessment Table

Following the intervention, Inspectors should performance score the mine operator's degree of compliance in accordance with the Table below.

| EMM RISK GAP                                                                                                                                                                                                                          |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                             |
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| EXTREME                                                                                                                                                                                                                               | SUBSTANTIAL                                                                                                                                                                                       | MODERATE                                                                                                                                                                                                                                                                       | NOMINAL                                                                                                                                                                                                                                                            | NONE                                                                                                                                                                                                                                                              | NONE                                                                                                                                                                                                                                                                        |
| TOPIC PERFORMANCE SCORE                                                                                                                                                                                                               |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                             |
| 60                                                                                                                                                                                                                                    | 50                                                                                                                                                                                                | 40                                                                                                                                                                                                                                                                             | 30                                                                                                                                                                                                                                                                 | 20                                                                                                                                                                                                                                                                | 10                                                                                                                                                                                                                                                                          |
| Unacceptable                                                                                                                                                                                                                          | Very Poor                                                                                                                                                                                         | Poor                                                                                                                                                                                                                                                                           | Broadly Compliant                                                                                                                                                                                                                                                  | Fully Compliant                                                                                                                                                                                                                                                   | Exemplary                                                                                                                                                                                                                                                                   |
| <p>Far below relevant minimum legal requirements.</p> <p>Degree of non-compliance extreme and widespread.</p> <p>Failure to recognise issues, their significance, and to demonstrate adequate commitment to take remedial action.</p> | <p>Substantially below the relevant minimum legal requirements.</p> <p>Degree of non-compliance substantial.</p> <p>Failures not recognised, with limited commitment to take remedial action.</p> | <p>Significantly below the relevant minimum legal requirements.</p> <p>Degree of non-compliance significant.</p> <p>Limited recognition of the essential relevant components of effective health and safety management, but demonstrate commitment to take remedial action</p> | <p>Meets most of the relevant minimum legal requirements.</p> <p>Degree of non-compliance minor and easily remedied.</p> <p>Management recognise essential relevant components of effective health and safety management, and commitment to improve standards.</p> | <p>Meets the relevant minimum legal requirements.</p> <p>Management able to demonstrate adequate identification of the principal risks, implementation of the necessary control measures, confirmation that these are used effectively and subject to review.</p> | <p>Exceeds the relevant minimal legal requirements.</p> <p>Management committed and proactive in devising and implementing an effective safety management system to achieve 'best practice' and beyond legal requirements. Actively seeks to further improve standards.</p> |
| EMM INITIAL ENFORCEMENT EXPECTATION                                                                                                                                                                                                   |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                             |
| Prosecution / Enforcement Notice.                                                                                                                                                                                                     | Enforcement Notice / Letter.                                                                                                                                                                      | Enforcement Notice / Letter.                                                                                                                                                                                                                                                   | Letter / Verbal warning.                                                                                                                                                                                                                                           | None.                                                                                                                                                                                                                                                             | None.                                                                                                                                                                                                                                                                       |

| <b>Plan</b> | <ol style="list-style-type: none"> <li>1. The health and safety document identifies those with responsibilities for the preparation, execution and revision of the escape and rescue plan and where it and copies are to be kept.</li> <li>2. There is a written escape and rescue plan that has taken into account the findings of all relevant risk assessments.</li> <li>3. There is evidence that the mine operator has considered what suitable equipment will be required for use in an emergency.</li> <li>4. The escape and rescue plan must stipulate: <ul style="list-style-type: none"> <li>• the arrangements required so that persons below ground at a mine can reach a safe place promptly in the event of an emergency</li> <li>• the arrangements required for the safe and prompt evacuation and rescue of persons who may be trapped to a safe place.</li> </ul> </li> <li>5. The mine operator has set out specific H&amp;S roles and responsibilities for staff at all levels within the management structure from the CEO downward. These should include: <ul style="list-style-type: none"> <li>• the action required to ensure staff awareness of hazards and compliance with the mines emergency procedures</li> <li>• the control of abnormal situations, including emergencies.</li> </ul> </li> <li>6. Managers and supervisors at all levels accept responsibility for the escape and rescue arrangements that are in place. They should have sufficient resources to carry out their duties in this respect, and lead by example in ensuring that the control systems and schemes are properly maintained.</li> <li>7. All employees from the most senior operational managers to front line operatives have received adequate instruction and training on the emergency arrangements that are in place. This should include: <ul style="list-style-type: none"> <li>• written instructions on the actions to be taken in the event of an emergency</li> <li>• training of appropriate persons in the use of emergency equipment and written instructions on the use, handling and operation of emergency equipment and safety drills at regular intervals.</li> </ul> </li> </ol> |
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| <b>Do</b> | <ol style="list-style-type: none"> <li>1. Suitable arrangements are in place to keep a record of persons below ground at the mine so that in an emergency they can be accounted for. This should include provision for rescue personnel (emergency tally system).</li> <li>2. Suitable emergency equipment and communications systems are available at all times for any escape and rescue operation ie sufficient telephones or intercoms for people to contact each other and the mine surface.</li> <li>3. Suitable auxiliary equipment, such as an emergency winder (the actual choice will depend on risks identified), is available to allow persons to leave the mine if the normal equipment used to leave the mine breaks down.</li> <li>4. The emergency plant and equipment is maintained in good condition (has a suitable written scheme for its systematic inspection, maintenance and testing) and is stored in easily accessible places.</li> <li>5. The escape and rescue plan is clear and up-to-date, with review dates noted. It is readily accessible to those expected to follow it.</li> <li>6. Operators understand and follow the escape and rescue procedures.</li> <li>7. Managers lead by example by: <ul style="list-style-type: none"> <li>• carrying out regular management over-inspections of escape and rescue facilities and equipment and being intolerant of poor standards</li> <li>• participating in periodic practices and attending H&amp;S training sessions.</li> </ul> </li> <li>8. There is an effective system for upwards reporting of any deficiencies in the emergency plan, risk assessments and associated operating procedures.</li> <li>9. People with responsibilities under the operating procedures or schemes are competent to follow them.</li> <li>10. Escape and rescue procedures are practiced annually by all employees below ground, including managers. Everyone periodically comes out of the mine by the 2nd means of egress.</li> </ol> |
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| <b>Check</b> | <ol style="list-style-type: none"> <li>1. Are here monitoring systems for inspection, maintenance and testing of the facilities and equipment provided for escape and rescue?</li> <li>2. Are complaints routinely investigated?</li> <li>3. Is there is a system in place to review the plan at appropriate intervals?</li> <li>4. Is the monitoring suitable to ensure the arrangements in place?</li> <li>5. Are periodic audit arrangements in place to assess the effectiveness of the escape and rescue arrangements?</li> <li>6. Does testing of the arrangements to ensure that there access to sufficient numbers of competent people and equipment to be able to undertake rescue operations indicate the system is effective?</li> </ol> |
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| <b>Act</b>   | <ol style="list-style-type: none"> <li>1. Are there effective arrangements for auditing and reviewing performance?</li> <li>2. Has an improvement plan been established?</li> <li>3. Have procedures been reviewed and amended as a result of accident/incident outcomes?</li> <li>4. Has remedial action addressed deficiencies identified?</li> <li>5. What safety performance indicators are in place?</li> </ol>                                                                                                                                                                                                                                                                                                                                |







