

Health and Safety Executive - HM Mines Inspectorate

Major Hazard Topic Inspection Guide

PRECAUTIONS AGAINST INRUSHES AT MINES

1. Purpose

This document sets out how inspectors will assess operators' compliance with the relevant statutory provisions in respect to precautions against inrushes.

Any inrush at a mine is a major hazard that has the potential to cause multiple fatalities:

- Knockshinnoch Castle - 13 men killed in 1950 when a large volume of liquid peat broke through from the surface into a heading
- Lofthouse - 7 men killed in 1973 after a new development made contact with an abandoned 19th century flooded shaft
- [Gleision](#) – 4 men killed in 2011 when a large body of water released from old mine workings rushed into the working stall

2. Scope

The inspection will focus on the key hazard of inrushes and the associated safety management systems for managing the risks. 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 all potential inrush hazards at the mine?
- has the mine operator completed suitable and sufficient risk assessments?
- have effective preventative and mitigating barriers been put in place?
- 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 control and mitigation measures being monitored and reviewed?

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 select a part of the mine to inspect and evaluate the effectiveness of the safety management arrangements and risk control systems.

Inspectors should determine how well the mine operator is controlling the risk of an inrush by assessing:

- a) The adequacy of the information that the mine operator has obtained to determine if any of the mine workings are being worked, or are proposed to be worked in a potentially hazardous area.

- b) The adequacy of the risk assessment that the mine operator must undertake if the information obtained identifies that any of the mine workings will be 45m (in any plane) from the surface or any potentially hazardous area or 37m (in any plane) from any disused mine workings. This should assess the likelihood of an inrush from any of these hazards and determine if any precautionary measures are necessary to prevent an inrush.
- c) The adequacy of any resulting scheme of work that lays down the precautionary measures to ensure that an inrush does not occur. This should describe the method of work, the equipment to be used and the rules to be applied.
- d) How well the procedures required by the scheme have been implemented i.e. the arrangements in place (management, inspection, monitoring) to ensure that the rules are applied and enforced.

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 operators' performance score in accordance with the **Performance Assessment Table** shown below.

Where further action is required to achieve compliance this will be taken in accordance with HSE's Enforcement Policy Statement.

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 33 Precautions against inrushes

Regulation 34 Information about inrush hazards

Regulation 35 Mine workings in potentially hazardous areas

Regulation 54 Escape and rescue plan

Regulation 58 Surveyor

Regulation 59 Working plans, sections, ventilation plans and geological map

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

Table 1

Performance scores

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

EMM RISK GAP					
EXTREME	SUBSTANTIAL	MODERATE	NOMINAL	NONE	NONE
TOPIC PERFORMANCE SCORE					
60	50	40	30	20	10
Unacceptable	Very Poor	Poor	Broadly Compliant	Fully Compliant	Exemplary
Far below relevant minimum legal requirements. Degree of non-compliance extreme and widespread. Failure to recognise issues, their significance, and to demonstrate adequate commitment to take remedial action.	Substantially below the relevant minimum legal requirements. Degree of non-compliance substantial. Failures not recognised, with limited commitment to take remedial action.	Significantly below the relevant minimum legal requirements. Degree of non-compliance significant. Limited recognition of the essential relevant components of effective health and safety management, but demonstrate commitment to take remedial action	Meets most of the relevant minimum legal requirements. Degree of non-compliance minor and easily remedied. Management recognise essential relevant components of effective health and safety management, and commitment to improve standards.	Meets the relevant minimum legal requirements. 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.	Exceeds the relevant minimal legal requirements. 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.
EMM INITIAL ENFORCEMENT EXPECTATION					
Prosecution / Enforcement Notice.	Enforcement Notice / Letter.	Enforcement Notice / Letter.	Letter / Verbal warning.	None.	None.

Plan	1. There is a health and safety policy that is dated and signed that identifies major hazards, including inrushes, and sets out the mine operator's aims and objectives. 2. The mine operator has put in place a suitable management structure and set out specific H&S responsibilities for staff at all levels to control the risk of the major hazards present, including inrushes. 3. The mine operator and those appointed to the management structure understand the prevention of inrushes principles 4. The arrangements include clear procedures for those with H&S roles or responsibilities in relation to: • how inrush risk assessments, and any schemes, will be completed, implemented and reviewed? • who is responsible for the selection of suitable plant and equipment required by the scheme? • who is responsible for determining the optimum location of any monitoring? • sufficient resources to implement the scheme? • staff competency to deliver their responsibilities? • any periodic independent oversight applied? 5. Managers and supervisors at all levels accept their responsibilities in relation to controlling inrushes risks and lead by example in ensuring that risk control measures are properly maintained. 6. All employees from the most senior operational managers to front line operatives have received adequate instruction and training on inrush hazards, risks and risk control systems and understand: • the importance of ensuring that prevention of inrushes control measures are properly installed • the function of consultation between managers and workers in the drawing up the method of work • the role of monitoring in identifying the health of prevention of inrushes control measures • the potential consequences of the failure <i>of prevention of inrushes control measures</i>. 7. Adequate arrangements are in place for informing and consulting staff (Safety Reps + Safety Committees Regs 1977)

Do	1. The mine surveyor has prepared an up to date working plan. 2. Sufficient information has been obtained by the mine operator to determine if any of the mine workings are being carried on, or are proposed to be carried on in a potentially hazardous area. 3. If the information obtained identifies if any of the mine workings will be within 45m (in any plane) from the surface or any potentially hazardous area or 37m (in any plane) from any disused mine workings then a suitable and sufficient risk assessment has been undertaken. 4. The risk assessment has assessed the likelihood of an inrush from any of the hazards identified and has determined if any precautionary control measures are necessary to prevent an inrush from occurring. 5. The risk assessment has been kept up to date 6. If precautionary measures are necessary then there is an adequate scheme of work that lays down the procedures to ensure that an inrush does not occur. The measures and how they should be implemented should include sufficient diagrams and text to show the stage by stage sequence of operations and be in a form that can be easily understood. An adequate plan should also be included. 7. The scheme of work has been communicated to and is understood by those with responsibility for the implementation of prevention of inrushes control measures. 8. The procedures required by the scheme of work have been acted upon 9. There is an effective system for upwards reporting of deficiencies in assessments, design documents and prevention of inrushes control measures etc.

Check	1. Are there monitoring systems for: • routine inspection of premises, plant and equipment? • checking management arrangements for preventing an intruder are implemented and effective? • ensuring staff understand and follow the procedures that are in place to control the risk of an intruder ? 2. Complaints and incidents are investigated? 3. Is there an effective reporting system for near miss incidents? 4. Is there sufficient monitoring of information that could indicate that the likelihood of an intruder has increased? 5. Are there any arrangements for independent third-party audit? 6. Are structured periodic audit arrangements are in place to ensure arrangements are monitored to measure their performance? 7. Is the audit programme risk-based and targeted at major hazard risk control and safety management systems?
Act	1. Are there effective arrangements for reviewing performance? 2. Has an improvement plan been established? 3. Have procedures been reviewed and amended as a result of accident/incident outcomes? 4. Has remedial action addressed deficiencies identified? 5. What safety performance indicators are in place?







