



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

**Technical Reference
Mine Safety
CTR-005**

NSW DPI Technical Reference

**Auditing of dust explosion management plans
for underground mines**

**Licensing requirements under clause 149 (1) (c) of the
*Coal Mine Health and Safety Regulation 2006***

Supplement to Guidance Note GNC-010 licensing

May 2007 (version 1)

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Background - Dust Explosion Management Plan

The NSW Department of Primary Industries (NSW DPI) has prepared this technical reference for use by individuals wishing to apply for a licence under Part 5, clause 149 (1) (c) of the *Coal Mine Health and Safety Regulation 2006* (the Regulation) to audit dust explosion management plans (made under clause 36 of the Regulation) as part of the major hazard management plan process.

Major Hazard Management Plan: Dust Explosion Management Plan.

Part 5, subdivision 2 of the *Coal Mine Health and Safety Act 2002* (CMHS Act) requires major hazard management plans to be developed for prescribed hazards and any major hazard identified by the operator in the operator's assessment of risks. Clause 36 of the Regulation requires the operator of a coal operation to prepare a dust explosion management plan.

The CMHS Regulation outlines the measures, arrangements and procedures to be taken in relation to dust explosion suppression at a coal operation. The following is an excerpt from the CMHS Regulation.

36 Contents of major hazard management plan: dust explosion management plan

For the purposes of section 36 of the Act, a major hazard management plan in relation to a major hazard comprising hazards arising from the initiation and propagation in the underground parts of a coal operation of dust explosions must make provision for the following matters:

- (a) the minimisation of production and accumulation of roadway dust,*
- (b) the maintenance, through the application of stone dust or otherwise, of the incombustible content of roadway dust required by Division 2 of Part 4,*
- (c) the required application rates and means of application of stone dust to be applied in working places,*
- (d) the methods by which parts of advancing working places that have not yet had stone dust applied are to be maintained in a safe condition,*
- (e) the means by which stone dust is to be applied to surfaces in return roadways in close proximity to working faces,*
- (f) the application of stone dust to previously untreated roadway surfaces (resulting from roof or rib spall, the movement of plant or otherwise), (g) the procedures, methods or indicators to be used to give an indication whether or not required levels of incombustible content of roadway dust are being maintained,*

- (h) the procedures for, and frequency of, examination, sampling and testing of roadway dust to confirm whether or not required levels of incombustible content are being maintained,*
- (i) the procedures for the re-application of stone dust in parts of a mine (with particular reference to roadways containing conveyor belts),*
- (j) the procedures for the installation and maintenance of explosion barriers and other explosion suppression measures,*
- (k) the means (which must comply with Division 2 of Part 4) for determining and recording maximum likely concentrations of inflammable gas in parts of the mine,*
- (l) the making and retention of reports of examination, sampling and testing of roadway dust and the examination of explosion barriers,*
- (m) provisions for periodic audits (at intervals not exceeding one year) of the plan's operation, in relation to which:*
- (i) each auditor must be a licensed person, and (ii) the operator must, in respect of each audit of the mine's explosion suppression system's operation, obtain from the auditor a report as to whether or not the system is being followed at the mine, and as to whether or not the intended aims of the system are being achieved, and*
 - (iii) the operator must provide a copy of each report to the Chief Inspector and an industry check inspector as soon as practicable after the conduct of the audit, together with a report by the operator as to how any shortcomings revealed by the audit are to be rectified.*

Note. Division 2 of Part 4 makes further provision for the control of coal dust explosions.

For further information on the major hazard management plans refer the Act (www.legislation.nsw.gov.au) and the NSW DPI Guidance Note GNC-003 Health and Safety Management Systems.

Qualifications

The applicant for a licence for the auditing of dust explosion management plans in underground coal mines must satisfy the licenser (NSW DPI) that they have sufficient qualifications and training to undertake the auditing. The applicant must have, as a minimum, the following qualifications and training:

- RABQSA-OH (accredited) Occupational Health and Safety Management Systems Auditing course certificate or equivalent.

NOTE: There are a number of training providers who offer the RABQSA-OH accredited course. Applicants are encouraged to contact a number of providers to ensure they find the course which most suit their needs.

A transition period of 12 months (until 2 April 2008) has been created to allow persons previously accredited to audit explosion suppression systems under Clause 175 of the Coal Mines (Underground) Regulation 1999 and without the audit qualification to perform the functions of a licensed auditor. An interim licence will be issued during this time. After this date applicants will be required to reapply and satisfy the auditor qualification provision above.

Stages of application

There are two stages of application for a licence to audit dust explosion management plans.

1. The applicant must complete and submit a written response to a suite of questions provided with this Technical Reference document (attachment 1). These questions investigate the applicant's general knowledge about explosion suppression systems.

2. If NSW DPI is satisfied with the responses made the applicant will be requested to present for a written examination (duration 1 hour) of the relevant legislation (Clauses 36,91,92,93,94 and 95 Coal Mine Health and Safety Regulation 2006) and an interview by a panel investigating an applicants overall knowledge of material contained in attachment 2.

Application

Format

The licence shall contain as a minimum:

- (a) Licence Application Form (see GNC-010 Licensing).
- (b) Attachment 1. Applicant questions - auditing dust explosion management plans.

References

1. The Guideline for 'Coal Dust Explosion Prevention & Suppression' MDG 3006 MRT 5 (December 2001)
2. Coal Mine Health and Safety Act 2002 and the Coal Mine Health and Safety Regulation 2006.

NSW DPI Contact Details

NSW DPI Mineral Resources offices located in coal mining regions

North East Area Maitland

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Maitland NSW 2320

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2310

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South East Area Lithgow

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Lithgow NSW 2790

Phone: (02) 6350 7888

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Wollongong NSW 2500

PO Box 674

Wollongong NSW 2520

Phone: (02) 4222 8333

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Attachment 1 - CTR-005

The following questions are to be completed by persons seeking to be considered by the NSW Department of Primary Industries to be licensed to conduct audits of dust explosion management plans.

Once complete these answers must be returned to the Chief Inspector based in the Maitland office of DPI.

Please attach answers on a separate page where additional space is required.

1. What formal training have you had in auditing management systems?

(Note: qualification documentation may be checked in the interview process)

2. What practical experience have you had in auditing management systems?

3. Understanding the science and practice of dust explosion management systems and plans.

a. How familiar are you with the contents of Part A of the NSW DPI publication "Guidelines for Coal Dust Explosion Prevention and Suppression" MDG 3006 MRT 5 (December 2001)?

b. Have you read any other scientific literature and research findings on the subject of coal dust explosions? If so, give an outline of the material.

c. What experience have you had with underground coal mining operations?

- d. What experience have you had of the use of stone dust and passive explosion barriers in underground coal mines?

- e. Do you claim to be familiar with, and understand, Clauses 36, 91, 92, 93, 94 and 95 of the Coal Mine Health and Safety Regulation 2006?

- f. What experiences have you had which would allow you to recognize defects in the implementation of stone-dusting or explosion barriers?

- g. What exposure have you had with the sampling and testing of roadway dust?

4. Awareness of the underground mining environment.

- a. To what level have you been inducted for underground work in coal mines?

- b. What experience have you had in reading mine plans?

5. Have you produced reports which might be of a similar nature to those required by the Clause 36 (m)(ii) of the Coal Mine Health and Safety Regulation 2006?

6. Conflict of interest

a. Are you aware of any actual or potential conflict of interest if you were to audit dust explosion management plans for underground mines? (For example: are you, or is your organisation, also associated with the supply of explosion suppression services or equipment to coal mines?) If so, please describe the nature of the conflict of interest.

b. If there is an actual or potential matter of conflict how would you ensure the integrity of your auditing function?

7. Is there other information which you think may be helpful in assessing your application?

Details of the person completing this application:

Name: _____ Date: _____

Organisation (if relevant): _____

Signature: _____



Attachment 2 - CTR-005

The following matters are topics that applicants for a license to conduct audits of explosion suppression systems are likely to be questioned upon by an interview panel from the NSW Department of Primary Industries.

- A general understanding of the flammability of gases – lower and upper flammable limits; differences between flammable limits for different gases; ignition energies (what they mean in practice); ignition temperatures; stoichiometric mixture (i.e. correct ratio of fuel to oxygen) and its significance;
- Awareness of the types of occurrence of flammable gas in mines – from the seam being mined, from strata above and below the mined seam; from heating of coal; gas layers at both roof and floor; the problem of gas ‘fuses’ leading to larger accumulations of gas;
- Awareness of the potential sources of ignition in coal mines, and a general appreciation of the methods which can be used to eliminate or control them;
- A general understanding of the flammability of coal dust – lower and upper flammable limits; ignition energies (what they mean in practice); ignition temperatures; the factors which affect flammability (including volatile content, moisture content, incombustible content, particle size, strength of initiator etc);
- A general understanding of coal dust explosions – the relation between blast and flame; the range of speeds of blast and flame; the mechanism by which a coal dust explosion propagates; the ability of an explosion to propagate in a part of a roadway cross-section (such as in an upper or lower portion of a roadway), or along a strip on one side, or under a conveyor belt);
- Awareness of the hazard presented by float dust, and the use of trickle dusters and other methods to control it;
- A good understanding of the methods of suppression of coal dust explosions – water and stonedust, and the ways in which they act to prevent coal dust explosions;
- Understanding of the principles of operations of passive explosion barriers, including an awareness of the problems of timing, distance from the point of initiation, the dispersion of suppression agent into the roadway; and the differences between distributed and concentrated barriers;

- Awareness of the special problems of stopping very slow and very fast explosions;
- Detailed understanding of passive explosion barriers using stonedust and water (including the key design features which allow them to be effective, and the appropriate distances for barriers from the point of initiation); ability to check the calculations for loading and dimensions of barriers from requirements;
- Familiarity with the various types of gas monitoring systems used at coal mines (tube bundle and telemetry) and the characteristics of each; awareness of the processes used for calibration of these;
- Familiarity with the methods for sampling roadway dust, and for testing samples and recording results;
- Familiarity with underground coal mining operations, including the common hazards;
- Experience at reading mine plans.