**National Mine Safety Framework**

**Legislative Framework**

**Non-Core Drafting Instructions**

**for Mine Safety Legislation and Regulations**

**Drafting Instructions for consistency/uniformity of Mine Safety Legislation and Regulations in New South Wales, Queensland and Western Australia**

**Version: 6**

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**National Mine Safety Framework**

**Legislative Framework**

**Non-Core Merged Drafting Instructions**

General Requirements

1. **Background**

On 28 May 2010 the then Ministerial Council on Mineral and Petroleum Resources (MCMPR):

#### ***agreed*** to the recommendations made by the NMSF Steering Group for core NMSF Drafting Instructions (DIs) to be adopted by all jurisdictions with additional non-core DIs to be prepared for Queensland, New South Wales and Western Australia only, that can be added as required to core DIs in those states’ proposed complementary or stand-alone mine safety legislation and regulations;

#### ***agreed*** that the non-core DIs to be developed as consistent provisions by Queensland, New South Wales and Western Australia with co-ordination by the NMSF Secretariat and input from relevant state-based industry and union organisations on the NMSF Steering Group by December 2010, for a separate public consultation and COAG RIS process to meet the same implementation date (1 January 2012) as the WHS Act and regulations; and

#### ***agreed*** that where stand-alone or complementary legislative instruments are developed by those jurisdictions also requiring non-core DIs (to also include other material for high risk mining operations), preference be given by jurisdictions to consolidating such provisions in a mutually consistent manner.

#### After the MCMPR meeting, the meeting chair, the Hon Martin Ferguson formally transmitted the Core Drafting Instructions to the Hon Julia Gillard as chair of the Workplace Relations Ministers’ Council (WRMC) in a letter dated 25 June 2010.

#### The Hon Martin Ferguson also wrote on 25 June 2010 to the three non-core state Ministers outlining more details of the proposed process for the development of non-core legislation and regulations, stating:

#### “*In relation to the non-core drafting instructions, which some jurisdictions have made clear they would require to maintain important mine safety arrangements, an NMSF Working Group of those jurisdictions (Queensland, New South Wales and Western Australia along with the Commonwealth as Secretariat) together with relevant state-based industry and union representatives will separately progress this work, as we agreed on 28 May. The aim will be to develop a mutually consistent approach to the non-core drafting instructions to ensure as far as possible a nationally consistent approach and thereby meet the objectives set by the Council of Australian Governments when it endorsed the NMSF Implementation Report in April 2009. The outcomes of this additional legislative work would come into force at the same time as the model WHS Act and regulations on 1 January 2012.*

#### *While this non-core drafting exercise would continue to be progressed under the umbrella of the NMSF, it will only be relevant to certain jurisdictions. As such, I believe it would be appropriate for the new NMSF Working Group developing these additional drafting instructions to provide information only progress reports to the NMSF Steering Group with final decisions to be made by an ad hoc Committee comprising MCMPR Ministers of the participating jurisdictions.*”

#### Based on the MCMPR decision and Minister Ferguson’s letters, the NMSF Secretariat (hosted by the Commonwealth) and the three non-core states initiated meetings to consult with state-based union and industry bodies to develop the non-core Drafting Instructions via a Non-core Legislative Working Group (LWG). Much of the second half of 2010 was required for the three state regulators to review their existing legislation and regulations and develop proposals for greater consistency. These were progressively presented to social partners at LWG meetings.

#### Policy papers on proposed regulation in coal and metalliferous sectors and an approach to the ’11 red topics’ at the back of the final version of the core Drafting Instructions were distributed to social partners and a LWG meeting on 14 December 2010 was held to receive their initial feedback. Formal written social partner comment was sought by 14 January 2011. Regulators assessed the comments and modified the underpinning material where agreed. Detailed responses to all social partner comments were subsequently provided.

#### A first set of Non-core drafting instructions was sent to LWG social partners on 11 February 2011 and oral feedback was received on these at a LWG meeting held from 3-4 March 2011. Written comments from social partners were sought by 18 March. A second set of revised Drafting Instructions dated 1 April 2011 was sent to social partners on 2 April and these were discussed at an LWG meeting held from 28-29 April. Any additional social partner written comments were sought by 6 May 2011. Regulators met from 18-19 May and on 2 June to consider social partner comments and to make final revisions to the Drafting Instructions.

#### On 7 June 2011 a final set of Drafting Instructions was sent to social partners with a request to provide any written comments that they wish to be conveyed to the Ministerial sub-committee as part of its process to consider and endorse the DIs. Written comments were requested 14 days after receipt of the final version of the DIs.

Instructions - Specific Requirements

# **PART 1 – PRELIMINARY PROVISIONS**

# **Application**

* 1. The model Work Health and Safety (WHS) Mine Safety Regulations apply in relation to all mines and mining operations in the ‘core’ jurisdictions of Victoria, South Australia, Tasmania, the Northern Territory and the Australian Capital Territory.
  2. The ‘non-core’ jurisdictions of Western Australia, Queensland and New South Wales will incorporate the core WHS Mine Safety Regulations in their separate legislation and regulations as well as the additional material in these drafting instructions.
  3. The Mine Safety Regulations shall apply in relation to all Mines and Mining Operations.
  4. Mines and Mining Operations must be defined in the definitions section of the Regulations.
  5. The extent of detail required in the mine health and safety management system must, so far as is reasonably practicable, take into account the size and complexity of the mine and mining operations and the specific risks involved in the mining operations at the mine.

*Drafting Note: The following terms are required in the definitions section of the Regulations to enable the above clauses:*

* + 1. ***Mine****, which is broad enough to capture any place used for mining operations including surface or underground sites where mining operations take place including quarrying activities and also includes all machinery, equipment, appliances, plant, buildings and civil engineering structures used in conjunction with those mining operations;*
    2. ***Mineral*** *which means any:*

#### *naturally occurring –*

##### *inorganic element or compound, including an inorganic carbonate compound; or*

##### *organic carbonate compound; or*

#### *coal, lignite, peat or oil shale; or*

#### *extractive resources;*

#### *but does not include water.*

*[****Jurisdictional Note:*** *Jurisdictions may prescribe certain substances, compounds or processes to be included in the definition of Mineral or excluded for the purpose of the definition (for example where it is covered in other legislative instruments)*.]

* + 1. ***Mining Operation****, which captures all activities associated with the extraction of Minerals including exploration for minerals, mining of minerals, processing of minerals associated with a mine, tailings, spoil heaps, all waste dumps, decommissioning or rehabilitation of a mine and operational work associated with those activities including the excavation, removal, handling, transport and storage of minerals, substances, contaminants and wastes, the construction, operation, maintenance and removal of plant and buildings and any mine tourism (including mine education and mine research activities conducted at a mine). The definition must also include preparatory* *maintenance and repair activities associated with the mine. Preparatory is to be understood as including the design of the mine.*

[*Review definitions once core provisions are available to ensure consistency*]

# **Definitions**

## **Abnormal circumstances** is when it becomes necessary for a person to enter a highwall mining excavation at a surface mine to rescue someone or recover plant.

## **Bolted zone** means the area around an underground roadway that has been penetrated by roof, rib or cable bolts.

## **Brushing** means removing a layer of material from the floor, roof or side of a heading or cut-through.

## **Control** in the context of a risk means control of the risk in the following order (and in combination) until the risk is minimised so far as is reasonably practicable (the Hierarchy of Controls referred to in 10.3(3) below):

* + 1. *elimination of the hazard;*
    2. *substituting the hazard with a hazard giving rise to a lesser risk;*
    3. *isolating the hazard from people put at risk;*
    4. *minimising the risk by engineering means;*
    5. *minimising the risk through administrative means such as adopting safe operating procedures, and providing training; and*
    6. *using personal protective equipment.*

## **Direct Supervision** means the oversight by the supervising person of the work of that person for the purpose of:

#### directing, demonstrating, monitoring and checking the person’s work in a way that is appropriate to the person’s level of competency;

#### remaining close to the person, within sight of the person and able to communicate with the person; and

#### ensuring a capacity to respond in an emergency situation.

## **Emplacement Area** means a wall or other structure that retains or confines reject material whether or not that wall is itself composed of reject material. An Emplacement Area includes, but is not limited to the following areas where reject material is proposed to be deposited:

### open void / in pit void;

### an elevated above ground containment structure;

### free-standing structure or structures;

### upstream holding structures; and

### any pile, heap, hole, excavation or place in which or on which waste reject material is piled, heaped, dumped, accumulated, deposited or placed,

### but does not include an accumulation or deposit of reject material situated underground.

## **ERZ** means Explosion Risk Zone.

## **ERZ0** means:

### An underground coal mine, or any part of it, where the general body concentration of methane is known to be, or is identified by a risk assessment as likely to be, greater than 2%.

### To remove any doubt, it must be declared that, if the general body concentration of methane in a part of the mine that is an ERZ1 or NERZ becomes greater than 2%, the part becomes an ERZ0.;

## **ERZ1** means:

### an underground coal mine, or any part of it, where the general body concentration of methane is known to range, or is shown by a risk assessment as likely to range, from 0.5% to 2%;

### each of the following places is an ERZ1:

#### a workplace where coal or other material is being mined, other than by brushing in an outbye location;

#### a place where the ventilation does not meet the requirements for ventilation set out in the mine safety legislation;

#### a place where connections, or repairs, to a methane drainage pipeline are being carried out;

#### a place where holes are being drilled underground in the coal seam or adjacent strata for exploration or seam gas drainage;

#### a place, in a panel, other than a longwall panel that is being extracted, inbye the panel’s last completed cut-through;

#### a goaf area;

#### each place on the return air side of a place mentioned in paragraphs (a) to (f) of this drafting instruction above, unless the place is an ERZ0; and

#### the part of a single entry drive with exhaust ventilation inbye the last fixed ventilation ducting in the drive.

### The requirement in drafting instruction (2)(a) above does not apply to:

#### a place where work is undertaken that is a shaft or roadway driven

#### from the surface in material other than coal; or

#### between seams that are predominantly driven in material other than coal.

## **Explosives** includes:

### a substance or thing containing a substance, manufactured or used with a view to produce:

#### a practical effect by explosion;

#### a pyrotechnic effect; and

### explosive precursors.

## **Hazard** means a situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals, electricity, working at heights, a repetitive job, bullying and violence, a badly designed workplace and inadequate management systems (for example, no procedures for performing tasks safely).

* 1. **Highwall mining** means mining conducted by remote controlled equipment that drives an underground excavation from the surface into a coal seam.
  2. **Hot Work** means welding, soldering, heating, cutting, grinding or vulcanising in which the surface temperature of the work or a tool for the work is likely to exceed 150°C.

## **Immediate Supervision** means close, direct supervision in which the supervisor maintains a direct line of sight and is in close proximity to maintain direct communication to issue instructions, immediately take physical control of activities or physically intervene in an emergency.

## **Mechanical energy** means all energy associated with plant and structures, other than electrical energy.

## **Mine** means any place used for mining operations including surface or underground sites where mining operations take place including quarrying activities and also includes all machinery, equipment, appliances, plant, buildings and civil engineering structures used in conjunction with those mining operations;

## **Mineral** means any:

#### *naturally occurring –*

##### *inorganic element or compound, including an inorganic carbonate compound; or*

##### *organic carbonate compound; or*

#### *coal, lignite, peat or oil shale; or*

#### *extractive resources;*

#### *but does not include water.*

## **Mining Operation** means all activities associated with the extraction of Minerals including exploration for minerals, mining of minerals, processing of minerals associated with a mine, tailings, spoil heaps, all waste dumps, decommissioning or rehabilitation of a mine and operational work associated with those activities including the excavation, removal, handling, transport and storage of minerals, substances, contaminants and wastes, the construction, operation, maintenance and removal of plant and buildings and any mine tourism (including mine education and mine research activities conducted at a mine). The definition must also include preparatory, maintenance and repair activities associated with the mine.

## **Mine Holder**, which is a person conducting a business or undertaking with control over a right to mine and must capture any person that is the holder of a relevant mining title, mining licence, prospecting permit, exploration permit, mineral development licence, mining lease or mining claim, owner of the exploration rights to a site, the owner of a quarry, or any other right to mine; and

## **Mine Operator**, which is the person conducting a business or undertaking appointed as or deemed to be the mine operator pursuant to the provision of the Mine Safety Regulations which requires the mine holder to appoint a mine operator.

## **NERZ** means negligible explosion risk zone, including:

### An underground mine, or any part of it, where the general body concentration of methane is known to be, or is identified by a risk assessment as likely to be, less than 0.5%;

### Without limiting the requirement in drafting instruction above, a part of the mine submerged by water is a NERZ;

### A NERZ may be divided into sub-zones to enable discrimination to be applied to tripping of the electricity supply to electrical circuits caused when gas detectors detect a general body concentration of methane of 0.5%. Each such sub-zone mentioned in this drafting instruction is a NERZ;

### Nothing in this drafting instruction is to be interpreted as preventing the Mine Operator from classifying a NERZ at the mine as an ERZ0 or ERZ1. If the Mine Operator makes a classification under this drafting instruction, the NERZ is taken, while the classification is in force, to be an ERZ of the type stated in the classification.

## **Permit to mine** means a controlled document that is issued once the protocol development by the mine operator detailing site specific criteria that must be met before mining operations can commence, has been met.

* 1. **Portable Electrical Equipment** means electrical equipment intended to be held in the hand during use or which is capable of being carried by one (1) person.

## **Primary haul road** means a road intended to be used, during the life of the mine, by heavy vehicles to move overburden, coal or reject from the mine and a road that is capable of carrying mixed traffic at operational speed.

## **Principal Control Plan** means a plan which:

### identifies the controls implemented for the management of risks to the health and safety of persons in mining operations;

### manages the risks arising from the aggregation and/or interaction of hazards and controls; and

### monitors and ensures the effectiveness of those controls.

## **Principal Hazard Management Plan** is a plan which must:

### provide for the management of all aspects of risk control in relation to the relevant principal hazard; and

### be set out and expressed in a way that is readily accessible and comprehensible to persons who use it.

### Without limiting (1) and (2), a principal hazard management plan must:

#### state the nature of the principal hazard to which it relates; and

#### describe how a risk assessment will be conducted in relation to the principal hazard;

#### specify the results of the risk assessment;

#### specify all control measures to be implemented to control risks to health and safety associated with the principal hazard; and

#### include all matters in Part 4 of this legislation.

## **Qualified electrical engineer** is to be defined as currently in NSW but will include the electrical engineering manager or someone competent to be appointed to this position in Queensland.

## **Reject material** means a by-product produced from the beneficiation process, whether it is in a solid or fluid state. Reject material also means any carbonaceous material, whether it is mixed with or attached to stone or not, that is left after the treatment of coal in a coal preparation plant or that is not dealt with as coal by the mine operator.

## **Risk** means the probability of an adverse effect arising from a hazard, either alone or in combination with other hazards, and the potential magnitude of that effect.

## **Shaft** includes vertical and underlay or slope haulage.

## **Site Senior Executive** is the most senior natural person employed or otherwise engaged on an ongoing basis by the mine operator on or near the mine appointed as the site senior executive at the mine.

## **Supervisor** is a mine worker who is authorised by the mine operator to give directions to other mine workers in accordance with the mine’s work health and safety management system. A mine operator must not assign the tasks of a supervisor to a person unless the person-

### is competent to perform the task assigned; and

### has the competencies declared and published by the Board of Examiners.

## **Width**, in relation to a road, is defined as the width of the road’s usable running pavement clear of guide posts, grader rills and safety berms.

* 1. **Work Health and Safety Management System**means that part of the overall management system which includes organisation structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining policies and managing the work health and safety risks associated with the mining operations.

## [***Jurisdictional Note****: WA will regulate and manage open cut coal mines as if a metalliferous open cut mine*]

# **PART 2 – ADDITIONAL DUTIES RELATING TO MINING OPERATIONS**

1. **Duty to appoint a mine operator**

*Drafting Note:**Most of the obligations imposed by these Mine Safety Regulations are imposed on a “Mine Operator” that is the PCBU conducting the mining operations and officers and workers of that PCBU. It is critical therefore, that the regulations impose a duty on a mine holder to appoint a mine operator and a default mechanism in the event that such an appointment is not made. The appointment of a Mine Operator is not intended to derogate from any other duties that they may have under the Principal Act, particularly in their capacity as a person conducting a business or undertaking.*

**Obligation to appoint a mine operator**

* 1. A person conducting a business or undertaking that is a mine holder must be required to appoint a person conducting a business or undertaking as the mine operator for the relevant Mine.
  2. The mine operator will have responsibility for complying with the obligations specified in the Mine Safety Regulations, in addition to duties imposed on them as a person conducting a business or undertaking under the Principal Act.

## **Mine operator must have requisite control**

## Given the importance of the role of the PCBU appointed as mine operator in the operation of the regulatory regime for mine safety, the mine operator cannot be a mere token appointment. The entity must have the requisite control over the mine to discharge its duties under the legislation.

## ‘Control’ for the purpose of this provision means control over the activities and resources at the mine for the purpose of discharging the obligations of the mine operator under this legislation.

## The mine holder must only appoint a person conducting a business or undertaking as a mine operator if that person has control of the mining operations and must authorise the mine operator to exercise the degree of control over the mine necessary to discharge their obligations as a mine operator under this legislation.

## **Notification of Appointment in a prescribed form**

*Drafting Note: Certainty in the making of the appointment of a Mine Operator is critical to the effective operations of the relevant provisions.*

* 1. When notifying the regulator the notification must include an acknowledgment by that person of their acceptance of the proposed appointment.
  2. The notification to the regulator of the appointment must be in writing and in the form prescribed by the regulator.

**Notification of material change by mine holder**

* 1. A mine holder must notify the regulator as soon as reasonably practicable of any material change in the appointment of the mine operator including:

### the cessation, suspension or alteration in the appointment or

### any material change in the control or management of the mine operator that may impact on their appointment.

* 1. There must also be a default position provided for circumstance where the mine holder fails to appoint a mine operator. In such circumstances, the mine holder must be deemed to be the mine operator.
  2. The mine holder must keep records of the identity of any mine operator at the mine. The ready availability of documents at the office of the mine will ensure that inspectors of the regulator have ready access to the identity of the mine operator in exercising any of its powers at the mine.
  3. A change in mine holder of a mine does not impact on the nomination of the mine operator if the mine operator is still in control of the mine. The new mine holder should confirm the appointment of the existing operator. The existing nomination of a mine operator continues in place unless the regulator is told otherwise.
  4. There must be nothing in the clause which prevents the mine holder appointing itself as the mine operator.

**Notification of material change by mine operator**

## The mine operator must advise the regulator in the event of a change of:

### address of mine operator;

### business name of mine operator;

### contact details of the mine operator; or

### statutory position holders holding positions in accordance with 7.1(1)(a),(b).(d),(e); 7.1(2)(a),(b); 7.1(3)(a),(b); 7.1(4)(a)(b); and 7.1(5)(a) at the mine including details of the person’s competency to hold those positions.

* 1. The regulator must establish and maintain a public register of mine operators.

*Drafting Note: Nothing in these sections is intended to affect the liability of other PCBUs under the Model Work Health and Safety Legislation. PCBUs as Suppliers, controllers of Workplaces or related bodies corporate conducting a relevant business or undertaking at the Mine may have relevant obligations.*

1. **Provision of information**

**Provision of information to mine operator upon appointment**

* 1. Upon appointing a mine operator, the mine holder must, so far as is reasonably practicable, be required to provide the mine operator with all relevant information in the possession or control of the mine holder which may be reasonably required by the mine operator for the performance of its duties under the Mine Safety Regulations and/or the Principal Act.

**Provision of information by mine operator upon termination of appointment**

## A mine operator who is suspended, or ceases to be, a mine operator must provide all relevant safety information in the possession or control of the mine operator which may be reasonably required to the mine holder as soon as reasonably practicable. This is to ensure that the mine holder is able to provide the most up to date information to any new mine operator. The provision of accurate information is critical to ensuring the effectiveness of the health and safety management system in place in relation to the mining operations.

1. **Notification of the commencement and cessation of Mining Operations**

## The mine operator must, as soon as is reasonably practicable, notify the regulator of:

### commencement of mining operations;

### recommencement of mining operations;

### any significant interruption to mining operations;

### suspension of mining operations;

### abandonment of mining operations;

### intermittent mining operations.

## Notice of the mine operator’s intention to commence mining operations must:

### be in an approved form;

### include the global positioning satellite coordinates for the mining operations and where work is to be undertaken;

### include the location, scope and nature of the intended mine and details of the proposed mining operations including key infrastructure at the mine;

### include the identity and contact details of the Site Senior Executive at the mine;

### include the identity and contact details of an alternative to the Site Senior Executive as the secondary contact at the mine in the event of the unavailability of the Site Senior Executive;

### specify the proposed date of commencement of the mining operations at the mine;

### provide the intended date of conclusion of the mining operations at the mine; and

### include a list of anticipated principal hazards based on the proposed mining operations.

## The mine operator must notify the regulator of material changes to mining operations, including any material changes to the subsections (2) – (8) in the section above.

## The mine operator is not required to notify the regulator of exploration activities that only involve airborne geophysics or photogrammetry.

## The mine operator of an intermittent mining operation previously notified to the regulator is exempted from a requirement to notify the regulator when temporary suspension of the operation occurs.

## Notification by the mine operator must be made as soon as reasonably practicable but in any case no later than one month prior to the event listed at paragraph 5.1. The regulator may vary that notice requirement upon request by the mining operator.

## The regulator must confirm receipt of the notification in writing.

# 

# **Site Senior Executive Appointment**

## *Drafting Note: Mine operators will often be corporations who act through their officers, employees and agents. It is important for the effective regulation of mine safety that a regulator has a single point of contact with a mine to act as the directing mind and will of the mine operator. From a compliance perspective, it is critical that one person is in charge at any point in time for the purpose of ensuring that all adequate resources, expertise and systems of the mine operator are directed to compliance with their obligations under the mine safety legislation. It is therefore necessary to require the appointment of a single natural person with a sufficient level of seniority as the designated site senior executive for a mine.*

## The site senior executive must exercise due diligence to ensure compliance by the mine operator with its obligations under the Act and regulations including:

### the development, implementation and maintenance of an integrated Work Health and Safety Management System for the mining operations;

### ensuring that they understand the mining operations, its hazards and risk;

### that they acquire and keep up to date their health and safety knowledge;

### that they ensure that the resources, organisation structure, competencies of persons employed and processes of the mine operator are sufficient to comply with their legal obligations under the Act;

### ensuring a robust process for receiving and considering incident, hazard and risk information;

### verifying the provision and use of all the above processes.

## The site senior executive must be included and identified clearly in the management structure developed as a part of the work health and safety management system.

## The mine operator when appointing a site senior executive must, in so far as is reasonably necessary, make provision to cover the following:

### temporary appointment;

### alternate appointment; such as fly-in-fly-out arrangements.

## There can only be one site senior executive in charge at a mine at any one time. Nothing in these provisions prevents a site senior executive from being appointed as a site senior executive for more than one mine provided the mines are adjacent and / or they can fully meet their obligations as a site senior executive.

## *Drafting Note*: *The appointment of a site senior executive must take into account the size and complexity of the mine.*

## A site senior executive appointed in accordance with these provisions must consent to their appointment in writing.

## The mine operator must notify the regulator of the appointment of a site senior executive including, confirmation of the site senior executive’s consent to the appointment.

## The regulator must publish a list of Site Senior Executives on its website. The regulator may also include a list of temporary or alternative site senior executives on its website.

## Notwithstanding clause 6.4 above, if the mine is separated, the mine operator may nominate an additional site senior executive for the separated part of the mine.

# **Statutory Mine Safety Positions**

## [*Note: Transitional provisions will be required]*

## [***Jurisdictional Note****: Qld and NSW to retain existing arrangements regarding check and industry inspectors*]

## Each mine operator must appoint a person with a Practising Certificate issued by the Board of Examinersto the following positions:

### **coal underground**:

#### site senior executive;

#### underground mine manager;

#### undermanager (can be more than one);

#### electrical engineering manager;

#### mechanical engineering manager;

#### ventilation officer;

#### deputy (an appropriate number).

### **coal surface**:

#### site senior executive;

#### surface mine manager;

#### open cut examiner (an appropriate number).

### **metalliferous and extractive underground mines (not including opal or gemstone mines with less than 5 people)**:

#### site senior executive;

#### underground mine manager;

#### underground mine supervisor.

### **metalliferous and extractive surface mines (not including opal or gemstone mines with less than 5 people)**:

#### site senior executive;

#### surface mine manager/quarry manager.

### **opal mines and gemstone mines with less than 5 people**

#### site senior executive.

## Each mine operator must appoint a person with qualifications or competencies prescribed by the Board of Examiners to the following positions:

### **coal underground**:

#### mine surveyor;

#### fire officer;

#### roadway dust sampler.

### **coal surface**:

#### mine surveyor;

#### electrical engineering manager;

#### mechanical engineering manager .

### **metalliferous and extractive mines (not including opal or gemstone mines) with less than 5 people**:

#### mine surveyor;

#### electrical supervisor;

#### mechanical supervisor.

## A mine operator must appoint such competent persons to positions to ensure the effective implementation of the Work Health and Safety Management System prescribed under Part 3 of this legislation.

## If, in discharging their obligations above, a mine operator appoints a person to the following positions, they must have competencies as prescribed by the Board of Examiners:

### **coal underground**:

#### ventilation engineer;

#### supervisor;

#### shot firer.

### **coal surface:**

#### supervisor;

#### shot firer.

### **metalliferous and extractive mines:**

#### ventilation officer;

#### shot firer;

#### radiation safety officer;

#### supervisor.

## A person appointed in accordance with the above provisions (clause 7) must ensure that:

### they perform the duties specified in **Schedule A**, which relate to their position;

### they perform all duties, functions and responsibilities assigned to them with due care and skill and ensure that persons are not exposed to risks to their health and safety arising from the conduct of their duties.

# **Tri-state Competency Arrangements**

## *Drafting Note: Transitional arrangements must be made for holders of existing certificates of competency in each jurisdiction*.

## [***Jurisdictional note****: existing industry advisory committees should continue as forums to discuss broader mine safety issues within each jurisdiction and provide advice to governments*]

## **Existing Boards of Examiners**

## *Drafting Note: A Board of Examiners in each state is to be encourage to have consistency and uniformity in the competencies at mines and in their assessment, issuance, review procedures, etc.*

## The Board of Examiners in each state must have common standards and establish common processes with interstate counterparts, including:

### an obligation to consult with interstate Boards of Examiners when determining certain matters under the Mine Safety Legislation including the issuance of Practising Certificates under 7.1 above;

### an obligation to consider interstate standards when setting standards to ensure the competencies under this Act are consistent with competencies required by other states; and

### an obligation to consider the effective movement of workers between states.

## The Board of Examiners shall have the power to prescribe competencies to other positions (that is, positions without practising certificates) that appear in 7.2 to 7.4 above.

## The Board of Examiners may set up expert committees and panels, and/or engage specialist consultants to develop competencies, including as part of its contribution to a tri-state process.

## The Board of Examiners is to set the guidelines for maintenance of competency standards and continuing professional development (CPD), including:

### auditing;

### showing cause;

### compelling persons;

### compelling documents; and

### suspension and cancellation of practising certificates (such as where a person has been found to have acted in an incompetent manner or shown no regard for compliance).

## The Board of Examiners must recognised practising certificates issued in other jurisdictions from the commencement of this legislation. Transitional arrangements should be made for the mutual recognition of pre-existing practising certificates.

## The Board of Examiners must maintain a register of persons holding Practising Certificates and other competencies, consistent with the other states. This system is called cooperative registration.

## A person determined competent by the Board of Examiners must be able to work in the other states upon notifying the other state of their intention to commence performing the relevant functions within that other state.

## The Board of Examiners can cancel registration of a practising certificate if a Board of Examiners in another state has suspended or cancelled the practising certificate.

## The Board of Examiners may advise the Board of Examiners in another state of circumstances that might lead to the suspension or cancellation of a practising certificate.

## The cooperative registration system between Boards of Examiners outlined in 8.1 – 8.9 is not to be encumbered by privacy legislation.

### ***Drafting Note: Tri-state Competency Advisory Council (TCAC)***

### *The three states have agreed to establish a new Tri-State Competency Advisory Council (TCAC) by administrative means (underpinned by a new IGA or an amendment to the general non-core IGA augmented by a MOU between the three state Boards). TCAC would comprise a Chief Inspector from each state (alternating as Deputy Chair and providing the TCAC secretariat) and three other qualified members per state drawn from their Board and an independent chair agreed by the three state Ministers.*

### *TCAC would agree and provide advice on the competencies and process for positions requiring practising certificates and other positions in the Schedule and on maintenance of competencies and continuing professional development and recommend adoption by the state Boards. TCAC would utilise specialist input for particular competencies (funded by the state regulators or Boards).*

### **PART 3 WORK HEALTH AND SAFETY MANAGEMENT SYSTEM**

*Drafting Note:* *The development, implementation, maintenance and documentation of a work health and safety management system (****WHSMS****) in relation to mining operations is the cornerstone duty to achieving the objects of the Mine Safety Regulations. The WHSMS includes:*

### *Principal Hazard Management Plans:*

#### *Ground/Strata Control*

#### *Inundation and Inrush*

#### *Mine Shafts and Winding Operations*

#### *Roads and other vehicle operating areas and traffic management*

#### *Air quality, airborne dust and other airborne contaminants*

#### *Fire and Explosion*

#### *Gas outbursts*

#### *Spontaneous Combustion*

#### *Ionising Radiation*

*Principal Control Plans:*

#### *Mechanical Engineering Control Plan*

#### *Electrical Engineering Control Plan*

#### *Ventilation Control Plan*

#### *Explosives Control Plan*

#### *Health Control Plan*

#### *Emergency Response Control Plan.*

Work Health and Safety Management System

Ground/strata instability

Inundation and inrush

Mine shafts and winding operations

Roads, other vehicle operating areas and traffic management

Air quality, airborne dust and other contaminants

Fire and explosion

Gas outbursts

Spontaneous combustion

Ionising radiation

Other plans

Mechanical engineering

Electrical engineering

Ventilation

Explosives

Health

Emergency response

Manage other hazards

Principal Hazard Management Plan

Principal Control Plans

Site specific arising from risk assessments

Further Requirements

Misc/Administrative

Further Requirements

Functions/powers of the regulator

Consistency of State

Boards of Examiners

Tri-state Competency Advisory Council (TCAC)

Plans of mines

Connecting underground development

Abandoning mines

Prohibited and restricted items

Notifiable incidents

National Mine Safety Database

Incident notification and investigation

Release of information

Notification of high risk activities

Compliance assisted through Codes of Practice for specific topics

# **Work Health and Safety Management System**

* 1. The Mine Safety Legislation must impose a duty on mine operators to develop, document, implement and maintain an effective mine work health and safety management system which ensures, so far as is reasonably practicable, the health and safety of persons in relation to mining operations. Works at the mine and mining operations cannot commence without an WHSMS in place. *Drafting Note: This is an essential element of a mine operator’s compliance with its primary health and safety duty under section 19 of the Principal Act (primary duty of care). A breach of this duty must attract an appropriate penalty as it is central to the operation of the Mine Safety Legislation.*

**WHSMS must be commensurate with size and nature of operations**

* 1. The extent of detail required in the mine work health and safety management system must take into account the size and complexity of the mine and mining operations and the specific risks involved in the mining operations at the mine. The work health and safety management system must, so far as is reasonably practicable, form part of, and be integrated with, the mine’s overall management system.

**Additional matters to be included in WHSMS**

* 1. In addition to the specific requirements contained in the Mine Safety Regulations in relation to risk management and principal hazard management plan requirements, the work health and safety management system must, so far as is reasonably practicable, be required to include, but not be limited to, provisions that relate to:
     1. a comprehensive and integrated system for all control measures adopted in accordance with the risk management requirements set out in the Mine Safety Regulations;
     2. arrangements for managing the risks to health and safety of persons arising from the use of contractors in any mining operations[[1]](#footnote-1) in accordance with the hierarchy of controls;
     3. arrangements for managing the risks to health and safety of persons arising from the coordination of the activities and interfaces of other persons conducting a business or undertaking at the Mine in accordance with the hierarchy of controls;
     4. arrangements for conducting health monitoring/surveillance of workers in relation to any potential exposure of any worker to a hazard arising from Mining Operations. The obligation must be qualified to be limited to circumstances where the exposure may reasonably result in adverse health effects;
     5. arrangements for the management of risks arising from the use of explosives in mining operations [***Jurisdictional note:*** *different arrangements exist in each jurisdiction in relation to the regulation of explosives. These arrangements will continue pending national uniform legislation.*];
     6. a management structure and hierarchy of competent persons for the effective management of work health and safety of the Mine including appropriate arrangements for appointment of persons in acting roles and timely filling of vacant positions in the management structure;
     7. arrangements for setting out all the risk control measures which will control the risks to work health and safety from hazards and principal hazards at the mine; and
     8. making the work health and safety management system available for access by workers and inspection by the regulator.

**WHSMS must be reviewed and revised**

* 1. There needs to be a requirement in the provision for the implementation of regular review and continuous improvement processes in relation to the mine work health and safety management system. *Drafting Note: Review and audit processes are crucial to the success of the work health and safety management system at a mine. They are a method by which mine operators must, so far as is reasonably practicable, satisfy themselves that the way in which they are managing risks to work health and safety at the site (through implementation of the mine health and safety management system) is sufficient for the risks involved in the mining operations at the mine.*
  2. Review requirements must specifically include monitoring, assessment and regular inspection of the working environment at the mine.

*Drafting Note:* *Guidance material ought to be developed to provide information for mine operators regarding adequate performance standards against which the various components of a work health and safety management system (including control measures implemented to eliminate or minimise risks to health and safety) may be effectively audited including information regarding methods and frequency of such auditing processes.*

*Drafting Note: There are always changes occurring in the way in which mine work is undertaken and continuous review ensures that the elimination and minimisation of the risks keeps up with those changes in mining operations.* *Further, without continuous review of work health and safety management systems, improvements in health and safety management will not be systematically identified.*

**Triggers for review and revision of WHSMS**

* 1. The mine operator must review and if required revise the relevant component of the mine work health and safety management system:

### any time there is a material change to mining operations at the mine;

### before any material modification at the mine;

### after any notifiable incident in accordance with the Mine Safety Legislation;

### if work is changed due to health surveillance results; and

### after receiving information from a Health and Safety Representative in relation to a health and safety risk under Part 5 of the Principal Act (consultation, representation and participation).

* 1. The Mine Operator must review and revise the whole work health and safety management system as soon as reasonably practicable, and in any event within 12 months from commencement of the mining operations for which the mine work health and safety management system applies and (subject to any other triggers for review above) at least once every 3 years thereafter.
  2. Any review undertaken (in accordance with the above provisions) must be proportional to the risks involved in the mining operations.

## **Timing of review and revision**

## Once the need for review of a mine work health and safety management system is triggered, the mine operator must ensure the review occurs as soon as reasonably practicable having regard to all the relevant circumstances including but not limited to:

### ensuring the effectiveness of the mine work health and safety management system; and

### the nature of the relevant risks.

## **Maintenance of WHSMS Records**

## The mine operator must maintain:

### the current documented WHSMS and any records underpinning the WHSMS including any calculation, report, hazard identification, risk assessment or any other document used in its development (or otherwise required to be maintained by the Mine Safety Legislation); and

### any previous versions of the WHSMS which applied to the mining operations for the preceding seven year period.

## The mine operator must keep a copy of the mine work health and safety management system under document control at the mine site or mine office and must make a copy of the mine work health and safety management system available to the regulator upon request.

*Drafting Note: There are additional record keeping requirements in [10.7, 13.16, 13.24, 13.25, , 20.5,20.12,20.14, 20.26, 23.3, 23.7, 26.5, 41.]*

*Drafting Note: Consultation with workers is not specifically referred to in the Drafting Instructions for the main mine operator duties under the Mine Safety Regulations. Section 49 of the Principal Act (when consultation is required) contains triggers for consultation which would require consultation with workers in relation to the work health and safety management system, the principal hazard management plans, principal control plans and the emergency response plan.*

*Drafting Note: Information, instruction and training is not specifically referred to in the Drafting Instructions for the main mine operator duties under the Mine Safety Regulations. Section 19(3)(f) of the Principal Act (the primary duty) contains a duty for the PCBU (which would include a mine operator by virtue of the definition of mine operator for the Mine Safety Regulations provided in these Drafting Instructions at* 3 *(duty to appoint mine operator)) to ensure, so far as is reasonably practicable, that any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking is provided. On that basis, such a provision in the Mine Safety Regulations is unnecessary. Parliamentary Counsel is to indicate if (and to any extent), information, instruction and training in the mine safety context is not captured by the Principal Act (including information, instruction and training for mining hazards identified and risk controls implemented under each of the plans required by the Mine Safety Regulations).*

**Induction into WHSMS**

* 1. The mine operator must provide an induction to all workers on the WHSMS before commencement of work by the relevant workers.

**Provision of relevant component of WHSMS**

* 1. A Mine Operator must ensure that the relevant parts of the WHSMS in relation to a worker’s work are provided to a worker before the worker is allowed to commence work at the mine.

*Drafting Note: check wording of 9.13 against the core WHS Regulations and ensure workability.*

* 1. The mine operator must provide access to any information or parts of the work health and safety management system to workers and other persons as is necessary to protect them from risks to their health and safety having regard to their activities in relation to the mining operations.

### *Drafting Note: The definition section must include a definition of* ***Work Health and Safety Management System****. That part of the overall management system which includes organisation structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining policies and managing the work health and safety risks associated with the mining operations.*

## **Contractor management**

## Where the services of another person conducting a business or undertaking (such as, without limitation, contractors, alliance partners and joint venture partners) are to be used in mining operations, the mine operator must so far as is reasonably practicable provide the person (hereafter, “the contractor”) with all relevant information to allow the contractor to identify risks arising with respect to the proposed work to be conducted by the contractor.

## The contractor must then provide the mine operator with a health and safety management plan in relation to the work – the **Contractor Health and Safety Work Plan** - which sets out the work which the contractor proposes to adopt having regard to the risks to the health and safety of workers of the contractors and other persons who may be affected by the work in relation to their proposed work.

## The mine operator must review the Contractor Health and Safety Work Plan and assess any risks arising from Contractor Health and Safety Work Plan to any worker or other person in relation to the mining operations including workers engaged by the contractor.

## The mine operator must notify the contractor of any risks identified as part of this review and, if necessary, require the contractor to review, revise and resubmit the Contractor Health and Safety Work Plan having regard to risks identified through the mine operator’s review of the Contractor Health and Safety Work Plan.

## Once reviewed and revised as necessary in accordance with 9.18 above, the mine operator must incorporate the Contractor Health and Safety Work Plan in the work health and safety management system for the mining operations.

## No contractor activities are to commence at the mine until all workers engaged to conduct work for the contractor have been inducted in the mine work health and safety management system (which in accordance with 9.19 will incorporate the Contractor Health and Safety Work Plan) and have received training in relation to any relevant hazards and risks at the mine.

## The Mine Operator’s Work Health and Safety Management System (revised to incorporate the Contractor Health and Safety Work Plan in accordance with 9.19) is the work health and safety management system that will apply to the mining operations and which must be complied with by all workers at the mine (including the Contractor and workers of the contractor).

## **Communication of WHSMS to workers**

## *Drafting Note: In order for the mine work health and safety management system to be appropriately implemented at the mine, the mine operator must, so far as is reasonably practicable, be required to communicate the requirements of the work health and safety management system to workers at the mine.*

## The mine operator must also be required to ensure that the work health and safety management system is set out in a way that is readily accessible and comprehensible to the people who use it.

## **Shift communications**

## The mine operator must ensure that the mine work health and safety management system includes provisions for effective, documented communication between shift workers, shift supervisors and other relevant persons at the mine. *Drafting Note: This may include supervisor sign-off procedures, for example.*

## For the purpose of the above requirement, the shift communication system will be effective only if it communicates the following between the shift supervisor of one shift to the next:

### Up to date knowledge of mining operations;

### Any material changes affecting worker health and safety arising from the mining operations during the shift; and

### Any risks to worker health and safety indentified during the shift and any controls put in place to manage those risks.

## The mine operator must ensure that the communication systems and methods are clearly stated in the mine work health and safety management system and that the communication system and methods used are proportionate to the level of risk being controlled.

## **Effective communication systems at underground mines**

## The mine operator of an underground mine must, so far as is reasonably practicable, be required to ensure that an effective communication system is maintained in relation to communications from the surface of the mine to underground locations of a mine.

## *Drafting Note: Such a requirement is necessary in the work health and safety management system because effective communication systems must be available at all times.*

## Communication systems must, so far as is reasonably practicable, be able to be operated, particularly in emergencies, from strategic locations in the mine and operated remotely from the mining operations.

## ***Change management***

## The work health and safety management system must include methods for the identification of material changes in the operations, conditions, systems of work, resources or other changes in conditions which may create risks to health and safety of workers and other persons arising from mining operations.

## *Drafting Note: Risks arising from any material changes must be identified, assessed and controlled in accordance with the risk management obligations (see 10.4(5)).*

## ***Inspections at the Mine***

## *Drafting Note: The carrying out of routine inspections by competent persons is a basic requisite to ensure the health and safety of persons working in a mine and particularly coal mines. This has been highlighted in several major inquiries including the 1965 Bulli disaster and the 1994 Moura No 2 Inquiry. The different nature of mining operations and the particular hazards present require that certain inspections are carried out only by persons with specific training and identified competencies in managing the risks associated with the hazards.*

## The mine operator must ensure that regular inspections are undertaken by competent persons at the mine to ensure so far as is reasonably practicable, that the mine is safe and free from risks to health before commencement of mining operations and during mining operations.

## A competent person for inspections in a mine is a person with the skills to perform the scope and type of inspection.

## The Mine Operator, so far as is reasonably practicable, must ensure the continual monitoring of areas where ground/strata control activities are taking place that are not part of the day to day activities of the mine, to the extent necessary having regard to the risks associated with the mining operations.

## The Mine Operator must ensure that sufficient numbers of competent persons are appointed to carry out inspections and that a list is maintained of competent persons who are appointed to carry out inspections.

## The mine work health and safety management system must include a written procedure for conducting inspections. The procedure must, so far as is reasonably practicable, provide for:

### the matters relating to health and safety to be covered in each inspection, including the following matters outlined below that are relevant to the inspection:

#### the presence of flammable gases or contaminants in the atmosphere;

#### the adequacy of the following:

##### ventilation;

##### coal dust inertisation;

##### emergency, first aid and fire fighting equipment;

#### the condition of the following:

##### ventilation control devices;

##### auxiliary fans;

##### surfaces over which persons may travel or vehicles may be driven;

#### the support for the excavation;

#### the stability of roadways in the excavation;

#### indications of heating or fire;

#### abnormal water inflow;

#### plant malfunction;

#### the proper functioning of communication and monitoring systems;

#### excessive accumulation of mud, water, rock or coal;

#### environmental conditions;

### processes for recording inspection findings;

### taking action as a result of the inspection findings, including:

#### making things safe;

#### closing the entry to a dangerous part of the mine or removing persons from the part;

#### If mining operations at a mine had ceased, ensuring that no person goes underground until the mine has been inspected by a competent person.

### a programme setting out when inspections must be carried out.

### ***Supervision***

## The mine operator must ensure that the work health and safety management system incorporates provisions for the direct supervision of workers.

## The persons with responsibility for supervision of workers at the mine must be set out in the mine work health and safety management system including the hierarchy of such responsibilities.

## Each of the statutory mine safety positions (outlined in drafting instruction 5 above) as relevant to the mine, are to be clearly identified in the mine work health and safety management system in accordance with their relevant supervision responsibilities for workers at the mine.

## A person must not give a direction on health and safety overriding a direction or action taken by a person in a statutory position unless the person is identified in the management hierarchy as being in a more senior position and has an equivalent or higher qualification than that person in the statutory position.

## The minimum age to work underground will be 18 years except for apprentices who are receiving specific instruction or vocational training and are under immediate supervision in which case the minimum age is 16 years. The minimum age for workers on surface operations is 16 years.

## A person must be 18 years of age to handle explosives.

# **Risk management**

**Obligation to conduct risk assessments**

* 1. The mine operator must ensure that risk management processes and procedures including risk assessments are implemented at the mine.

*Drafting Note: This is an essential element of a mine operator’s compliance with its general health and safety duties under the Principal Act, including the consultation requirements under the Act.*

**Risk management forms part of WHSMS**

* 1. The risk management processes and procedures must be included in the Work Health and Safety Management System.

**Risk Management process**

* 1. The process of risk management must involve:

### the identification of all reasonably foreseeable hazards;

* + 1. assessing the risks arising from each hazard, developing a method of assessment that adequately addresses the hazards identified (this may include a risk analysis systematically using available information to determine the likelihood of a specific event and the consequences of such an event occurring and a risk evaluation which involves comparing the level of risk against pre-determined standards to determine the level of priorities to be allocated to each risk);
    2. the elimination of the hazards identified so far as is reasonably practicable and where it is not reasonably practicable to eliminate the hazard, minimise and control the risk so far as is reasonably practicable using the Hierarchy of Controls; and
    3. continual monitoring of the effectiveness of the controls implemented including processes for identifying, reviewing and responding to uncontrolled events.

## **Triggers for risk assessments**

## The mine operator must ensure that risk assessments are carried out:

### at the design stage of the mine;

### prior to the commencement of the mining operations;

### at adequate intervals or stages during mining operations having regard to the nature of the mining operations and the risks associated with such mining operations;

### when there is evidence that an existing risk assessment is no longer valid; and

### when there is a material change in the mine’s practices, processes or procedures.

## **Training in risk management**

## The Mine Operator must, so far as is reasonably practicable, ensure that all workers at the mine are trained and assessed to be competent in basic risk management techniques (unless a higher level is required) prior to commencing work at the mine and for each period not exceeding 5 years thereafter.

## **Public safety**

## Risk management processes must consider the health and safety effects arising from the mine on persons who are outside the mine who are not working at the mine.

**Record of risk management**

* 1. The risk management process must be documented and records kept of that process.

## **Procedures**

## Where the outcome of a risk assessment process determines that a risk is to be controlled through the use of administrative means, a procedure must be prepared and documented in relation to the method of control of that risk.

## *Drafting Note: The procedure in this provision must be developed in consultation with workers at the mine.*

# **Principal hazard management plans**

*Drafting Note: There are hazards associated with mining operations that, although they have a low likelihood of occurrence, have the potential for multiple fatalities including cumulative effects. This category of hazards is known as a Principal Hazard. The use of management plans to address principal hazards of mines was a key recommendation of the Moura No 2 Warden’s Inquiry.[[2]](#footnote-2)*

**Requirement to identify principal hazards**

* 1. Mine operators must be required to identify principal hazards associated with their mining operations.

## In relation to each principal hazard, the mine operator must develop a **Principal** **Hazard Management Plan** documenting how the risks to the health and safety of a person arising from the principal hazard will be eliminated or minimised so far as is reasonably practicable. PHMPs form part of the WHSMS and thus work at the mine and mining operations cannot commence until these plans are in place.

* 1. Mine operators must implement and maintain principal hazard management plans.
  2. The development, implementation and maintenance of each principal hazard management plan must include the assessment and control of both the individual and cumulative effects of hazards.
  3. Nothing in this section prevents a Mine Operator from integrating one or more Principal Hazard Management Plans or a Principal Hazard Management Plan with a Principal Control Plan.

*Drafting Note: The principal hazard management plan requirement is an essential element of a mine operator’s compliance with its primary duties of care under the Principal Act.*

* 1. The mine operator must provide the relevant Principal Hazard Management Plans to workers prior to them undertaking any work to which the hazard management plan relates.

*Drafting Note: check working of 11.6 against the core WHS Regulations and ensure workability.*

* 1. The mine operator must provide the Principal Hazard Management Plans to workers in plain and simple language.

1. **Principal Control Plans**

## A mine operator must identify the risks to health and safety arising from the aggregation and/or interaction of principal hazards, other hazards and risk controls arising out of mining operations.

## A mine operator must develop, implement and maintain a prescribed Principal Control Plan to manage the risks arising from the aggregation and/or interaction between hazards and controls arising out of mining operations. PCPs form part of the WHSMS and thus work at the mine and mining operations cannot commence until these plans are in place.

## A Principal Control Plan must cover the life cycle of the particular plant, equipment, processes, procedures and practices relevant to the plan, and be developed, implemented and periodically reviewed through consultation with a qualified and competent person, commensurate with the risks of the mining operation.

### ***Drafting Note:***

### *The following are prescribed Principal Control Plans:*

#### *Mechanical Engineering Control Plan*

#### *Electrical Engineering Control Plan*

#### *Ventilation Control Plan*

#### *Explosives Control Plan*

#### *Health Control Plan*

#### *Emergency Response Control Plan.*

* 1. Nothing in this section prevents a Mine Operator from integrating one or more Principal Control Plans or a Principal Hazard Management Plan with a Principal Control Plan.
  2. The Mine Operator must provide the relevant Principal Control Plans to workers prior to them undertaking any work to which the Principal Control Plan relates.

*Drafting Note: check wording of 12.5 against the core WHS Regulations and ensure workability.*

* 1. The mine operator must provide the Principal Control Plan to workers in plain and simple language.

# **PART 4 - PRESCRIBED PRINCIPAL HAZARD MANAGEMENT PLANS**

*The following are prescribed Principal Hazard Management Plans:*

#### *Ground/Strata Control*

#### *Inundation and Inrush*

#### *Mine Shafts and Winding Operations*

#### *Roads and other vehicle operating areas and traffic management*

#### *Air quality, airborne dust and other airborne contaminants*

#### *Fire and Explosion*

#### *Gas outbursts*

#### *Spontaneous Combustion*

#### *Ionising Radiation.*

*Drafting Note: check all principal hazards against the core WHS Regulations to ensure non-core has the same basis as the core and builds on it.*

1. **Ground/strata instability Principal Hazard Management Plan**
   1. Ground/strata instability is one of the principal hazards associated with mining operations.[[3]](#footnote-3) This is an issue for both metalliferous mines as well as coal mines. Mine operators must therefore be expressly directed to develop and implement measures to eliminate or minimise, so far as is reasonably practicable, the risks arising from this hazard for the purposes of meeting their primary duty under the Principal Act. Those measures must be documented and retained in the form of a principal hazard management plan.
   2. To ensure a comprehensive risk assessment is conducted at the design, operation and abandonment stages, mine operators must be required to consider the local geological structure and geotechnical conditions, seismic activity, subsidence at or outside the Mine, airblast and windblast potential and the adequacy of installed ground or strata support when developing the principal hazard management plan for ground/strata control.
   3. The Mine Safety Legislation must also require the principal hazard management plan for ground/strata control to provide for measures to prevent or minimise local and area failures in ground or strata integrity during the Mine’s design, operation and abandonment, having regard to all relevant matters, including:
      1. local geological structure and rock properties and their influence on rock stability and in situ rock stress; and
      2. the local hydrogeological environment, including surface and ground water; and
      3. geotechnical characteristics of the rocks and soil, including the effects of time, oxidation and water on rock support and stability; and
      4. the size and geometry of the mine's openings; and
      5. stope and pillar dimensions in an underground mine; and
      6. the presence of previously excavated or abandoned workings; and
      7. water inflow, drainage patterns, groundwater regimes and mine dewatering procedures and their influence on rock stability over time; and
      8. the collection, analysis and interpretation of relevant geotechnical data, including the monitoring of openings and excavations where appropriate; and
      9. design, control and monitoring of production and development blasts; and
      10. proposed blasting activities, including airblast from blasting or other sources; and
      11. the use of appropriate equipment and procedures for scaling; and
      12. the proper design, installation and quality control of rock support and reinforcement; and
      13. the timing of ground and strata support, to take account of geotechnical conditions and behaviour; and
      14. ensuring appropriate equipment and procedures to provide for the monitoring, recording and interpretation and analysis of data pertaining to seismic activity and behaviour of the mine; and
      15. the design, layout, operation, construction and maintenance of any dump or stockpile or emplacement area at the mine; and
      16. the location and loadings from existing or proposed mine infrastructure such as waste dumps, tailing storage haul roads and mine facilities; and
      17. proposed and existing mining operations, including the nature and number of excavations, the number and size of permanent or temporary voids or openings, backfilling of mine areas and stopes, abutments, periodic weighting and windblast; and
      18. appropriate filling and the material used for the filling of mined out areas; and
      19. slope stability.

## In relation to mines, the principal hazard management plan for ground/strata control must also provide for the preparation of plans showing support arrangements for working places and there must be a requirement for those plans to be displayed in locations which are readily accessible to workers.

## A person must not enter an area of unsupported ground/strata.

**Ground/strata support**

## Where a person is installing ground/strata support, the mine operator must ensure that sufficient temporary support is installed in order to minimise the risk to a person installing the strata support.

## An underground mine must have a written procedure for installing strata support.

## *Drafting Note: Where applicable, ensuring the stability of mine workings must include ensuring that ground / strata support has been installed. Such a requirement is necessary because in some circumstances, without strata support there is a significant risk of roof / wall collapse.*

## The Mine Operator must, so far as is reasonably practicable:

* + 1. eliminate the exposure of workers to risks arising from ground/strata instability; or
    2. If it is not reasonably practicable to eliminate, minimise the exposure of workers to risks arising from ground/strata instability.

## Where a risk assessment conducted under this drafting instruction has determined that strata support is required for a working place in order to minimise risks associated with the uncontrolled movement of the roof, ribs or floor of the working place, the mine operator must ensure that:

### suitable strata support methods are designed and implemented for the working place;

### no person enters the working place unless the strata support has been installed or the person is supervising, or engaged in, its installation;

### that the Work Health and Safety Management System provides for monitoring the effectiveness and integrity of strata support in each place used by a person for normal work or travel; and

### that the Work Health and Safety Management System provides for maintaining the integrity of the strata support, including, for example, by replacing defective supports.

## It is critical that the principal hazard management plan for ground/strata stability provide for consideration of the need to install more strata support or support installation at such frequency as is required. That is, strata support is not only an issue which ought to be considered at the commencement or at the abandonment of mining operations but a consideration which is required throughout the life of the mine, taking into account the experience and expertise of workers at the mine.

## The principal hazard management plan for ground/strata control must contain a statement that nothing in the management plan is to be read as preventing the installation of more strata support or support installation at more frequent intervals than is required by the principal hazard management plan itself.

## Support plans under the principal hazard management plan for ground/strata control must prescribe the following:

### the type of support;

### the dimensions of the support;

### the locations where there are varying types of support in use;

### the distance between supports;

### the maximum distance development can be advanced before support is installed; and

### the means of development support required to be installed in a manner such that they may be readily understood by those required to install the support.

**Stability calculations**

## The principal hazard management plan for ground/strata control must also provide for the calculations made in deciding pillar strength and stability and strata support requirements.

## The calculations to be provided for include:

### maximum opening widths; and

### the minimum dimensions of pillars to determine the probability of instability to be assigned to any pillar, consistent with the pillar’s role.

## Calculating the probability of stability will provide the mine operator with an indication as to whether the strata support is sufficient to ensure health and safety at the mine.

## Records of the calculations must be retained.

**Highwall mining**

## In relation to high wall mining, the mine operator must ensure that the principal hazard management plan for ground/strata control provides for a highwall plan in which the following is to be taken into account:

### pillar support;

### highwall support;

### the interaction of people and plant; and

### an assessment and management of any identified dangerous subsidence.

### *Drafting Note: definition of “highwall mining” is in the definition section.*

**Dumps and stockpiles**

## The Mine Operator must ensure that the principal hazard management plan for ground/strata control ensures that the risks associated with open cut dumps and stockpiles are eliminated or if it is not reasonably practicable to eliminate them, minimised so far as is reasonably practicable.

## *Drafting Note: The inclusion of this provision in the mine safety legislation is in order to ensure the risks associated with open cut dumps are considered by mine operators as this is an area which is often overlooked.*

**Emplacement areas**

## The mine operator must ensure that the principal hazard management plan for ground/strata control ensures that the risks associated with emplacement areas are eliminated or if it is not reasonably practicable to eliminate them, minimised so far as is reasonably practicable,

## *Drafting Note: “emplacement area” and “reject material” are defined in the definition section*.

## *Drafting Note: Provision also be made for the construction and use of Emplacement Areas.*

**Seismic Activity**

## The principal hazard management plan for ground/strata control must provide for the monitoring of natural or induced seismic activity and its impact on mining operations.

## *Drafting Note: Issues relating to seismic activity were the subject of consideration in the Beaconsfield Gold Mine Coronial Inquest into the death of a worker. In particular, inactivity by the mine operator after seismic activity was noted at that inquest. The investigation by Special Investigator Mellick into the Beaconsfield rock fall recommended that “commensurate with the level of risk, the mine operator must use appropriate equipment to monitor, record and interpret and respond to data pertaining to seismic activity and the behaviour of the mine”.*

## The Mine Operator must record and analyse data pertaining to seismic activity and its impact on mining operations.

## The principal hazard management plan for ground / strata control must also provide for stope scheduling, sequencing and timing of filling processes.

## The principal hazard management plan should provide for the resulting designs and their assumptions to be continuously modelled, tested and updated.

*Drafting Note: The Report to the Coroner in the Beaconsfield incident recommended that mines install geotechnically engineered ground support systems that are designed to contain events well in excess of magnitudes that have already been recorded or expected by appropriate modelling and that such support designs consider matters including: the intended life of the excavation; mining induced stress changes and potential cycles of loading and unloading; potential impacts of voids and void management; and tolerance for stability problems and rehabilitation.*

**Records**

## Records must be kept of ground/strata failures such as rock fall that have the potential to cause serious injury to persons.

## The Mine Operator must, so far as is reasonably practicable, investigate the causes of ground/strata failures including rock falls at the mine. Such an investigation must also include a risk assessment. Records must be kept of the investigation for the life of the mine.

## *Drafting Note: The recording of information regarding strata failures is a necessary requirement in order for mine operators to avail themselves of all essential information when reviewing hazard management plans and assessing the effectiveness of controls in the case of ground strata stability.*

# **Inundation and inrush Principal Hazard Management Plan**

* 1. Inundation and inrush are principal hazards in mining operations.[[4]](#footnote-4)
  2. To ensure a mine operator has adequate systems in place to eliminate or minimise the risk of sudden and unplanned entry of water, rock, gas or other materials or substances into underground workings, the Mine Safety Legislation must require mine operators to develop and implement a principal hazard management plan for inundation and inrush.
  3. The development of such a principal hazard management plan must include consideration of the proposed activities to be undertaken and:
     1. each potential source of inrush (for example, current, disused, abandoned or neighbouring mine workings (in the same seam or another seam or across strata), surface water bodies, backfill operations, underground cavities, highly permeable aquifers, bore holes, faults or other geological weaknesses); and
     2. potential sources of inundation including extreme weather, overflow or failure of levies and dam structures, failure or blocking of flow channels (either regular or overflow/emergency); and
     3. the nature and magnitude of all potential sources of inrush and maximum flow rates; and
     4. the location of other workings and the strength of the ground between workings; and
     5. the location, design and construction of dams, lagoons, tailings dams, emplacement areas and any other bodies of water or material that could become uncontained and enter the mine, including water or material entering the mine from cyclonic weather conditions and other major rain events; and
     6. the foreseeable worst case position for each potential source of inrush having regard to such things as the accuracy of plans of the mine including with respect to the location of other workings, variation in rock properties, geological weaknesses, future mining operations, geological changes or similar unknowns; and
     7. the potential for an accumulation of water, rock, gas or other materials or substances that could liquefy or flow into other workings or locations.
  4. The Mine Safety Legislation must require the mine operator to ensure that its principal hazard management plan for inundation and inrush provides for measures to effectively control, mitigate and monitor all critical factors that may affect the likelihood of an inrush or inundation hazard. It must ensure workers are at all times aware of the location of the faces being advanced and effectively monitor work in close proximity to other adjacent workings, including old workings.
  5. The principal hazard management plan for inundation and inrush must also identify, establish and maintain inrush control zones between the mine workings and each identified potential source of inrush and ensure that any inrush control zone identified in the principal hazard management plan is of sufficient distance to safely separate the mine workings from the relevant potential source of inrush or, in the case of a potential source of inrush that is not an accessible place in the same mine, is sufficient to provide adequate separation of solid rock between the mine workings and the assessed worst case position of the potential source of inrush and any particular systems of working developed for mining operations and working in inrush control zones.
  6. The principal hazard management plan for inundation and inrush must ensure exploratory bore holes or another appropriate method is used to check the location of old workings in the vicinity of the area in which the work is to be carried out, prior to the commencement of work in a new area of the mine.

## The principal hazard management plan for inundation and inrush must include a means of sealing or otherwise controlling a bore hole to prevent inrush. Inrush through bore holes is a unique source that is not generally covered by normal mining processes and as such is to be dealt with in the mine safety legislation.

* 1. If underground workings are proposed to be connected to other workings the principal hazard management plan must ensure the other workings are inspected or otherwise explored for any hazard that may pose a risk to the health or safety of any worker, prior to attempting to connect the workings.

## The principal hazard management plan must provide for all reasonably practicable measures to control the above hazards. Also, the principal hazard management plan must be maintained, reviewed and updated and checked regularly to ensure that it implements the best available knowledge of risk of inrush at the mine. The mine operator must also be required to ensure that the principal hazard management plan is reviewed and up-to-date before the mine is extended into any new area.

## The Mine Operatormust consider the mine survey plans in the preparation and maintenance of the principal hazard management plan for inundation and inrush including consideration of original historical survey plans which have been obtained from relevant persons. *Drafting Note: whether these are kept by regulators or lease holders differs between jurisdictions.*

## *Drafting Note: This provision is necessary in light of the Gretley Incident in order that mine operators can verify the accuracy of the copy of the plans that they hold against the originals which are held by relevant persons. In particular, the Gretley Judicial Inquiry recommended that:*

*“In assessing the risk of inrush, the consideration of the originals of any relevant plans and any relevant files or other material held by, or accessible by, the relevant government agency.”*

## The Mine Operator must record the assumptions made in developing the principal hazard management plan for inundation and in-rush.

## *Drafting Note: By recording the assumptions, a mine operator is in a position to review them at appropriate junctures in order to ensure that they are still current and correct. Such recording of assumptions in the development of inrush management plans was also a recommendation of the Gretley Judicial Inquiry.*

## Where the mine operator forms the opinion that it is not reasonably practicable for the risk of inrush to be practicably removed, or rendered harmless, it is to be a requirement that mining is prohibited.

## The reasoning of the mine operator must be recorded.

*Drafting Note: This requirement is necessary in order to explain the risk assessment process of the mine manager. It also promotes accountability, facilitates review and informs possible scrutiny by workers and inspectors alike. This was also an express recommendation of the Gretley Judicial Inquiry:*

*“If the mine manager is of the opinion that it is not practicable to remove or render harmless a potential source of in-rush – the manager shall document the reasons for being of that opinion and ensure the retention of that document at the mine.”*

## The principal hazard management plan for inundation and inrush must also include an objective written summary of the nature and magnitude of the identified risks of inrush.

*Drafting Note: This is required in order that there is accessible information for workers and other persons who require information in relation to the risk of inrush. This was also an express recommendation of the Gretley Judicial Inquiry.*

## The principal hazard management plan for inundation and inrush must also document any special systems of working developed for mining operations and working in inrush control zones, along with the assumptions underpinning the development of the special systems of work.

*Drafting Note: Such requirements were also express recommendations of the Gretley Judicial Inquiry and facilitate the review of systems of work in inrush control zones.*

## The principal hazard management plan for inundation and inrush must also include a requirement that prior to reducing the separation below 50 metres of solid rock (rock includes coal) between mine workings and a potential source of inrush emanating from an inaccessible place into the mine that exploratory drilling or other risk mitigation measures are put in place to address the risk of inundation or inrush.

*Drafting Note: This separation requirement is necessary to provide protection to workers in the event that they are required to work in an inaccessible part of the mine. In this regard, the Gretley Judicial Inquiry recommended that:*

*“In the case of a potential source of in-rush that is not an accessible place in the same mine – is sufficient to provide a separation of 50 metres of solid rock between the mine workings and the assessed worst case position of the potential source of inrush.”*

# **Mine shafts and winding operations Principal Hazard Management Plan**

## Mine operators must develop a principal hazard management plan for the purposes of eliminating and minimising risks arising from the design, construction, manufacture, installation, commissioning, maintenance, testing, repair, use, decommissioning and disposal of vertical and underlay or slope haulage mine shafts and winding operations.

## *Drafting note: Definition of “shaft” is in the definition section.*

## The principal hazard management plan for mine shafts and winding operations must include consideration of the:

### stability and integrity of the shaft;

### potential for fires in underground operations, the shaft or winder areas;

### potential for any unintended or uncontrolled movement of the conveyances within the shaft;

### potential for a detached conveyance to fall down the shaft;

### potential for fall of persons, equipment, materials or support structure into or within, the shaft;

### potential for failure of, or damage to, safety-related equipment and controls, including:

#### ropes bearing the weight of the shaft conveyance;

#### controls and limiting devices to prevent overwind, overrun, overspeed and other selected limits;

#### measures to detect, prevent or cause the winder to stop in the event of slack rope, drum slip or tail rope malfunctions;

#### braking system including emergency brakes and preventing free-fall of a conveyance;

#### warning systems for any emergency in the shaft; and

#### communication systems;

### potential for injury to people in a conveyance from material being carried in the conveyance or falling from a conveyance;

### need to enable people to escape from a stalled conveyance; and

### competency of the operator of the winder.

**Life cycle control measures**

## The principal hazard management plan for mine shafts and winding operations must provide life cycle control measures for ensuring that every winding system remains in a safe condition. The control measures must have appropriate integrity commensurate with the risk to health and safety.

* 1. The principal hazard management plan must include measures for eliminating or minimising the risk of shaft fires and the unintended movement or fall of persons, plant, equipment, substances, materials and any other objects.
  2. The principal hazard management plan must provide measures and life cycle control measures for ensuring that every winding system for a vertical and underlay or slope haulage shaft at the Mine remains in a safe condition and includes (but not be limited to) the following:

### ropes or other means that will enable the shaft conveyance to bear the weight that can reasonably be expected to be borne by the shaft conveyance;

### controls and limiting devices that prevent any shaft conveyance from being overwound or overrun or from travelling at an uncontrolled or unsafe speed;

### measures to prevent, detect and cause the winder to stop in the event of slack rope, drum slip or tail rope malfunctions;

### effective braking systems, including emergency braking;

### means for preventing slack rope, drum slip or tail rope malfunction;

### means for detecting and causing the winder to stop in the event of slack rope, drum slip or tail rope malfunctions;

### means for persons to escape from a stalled conveyance;

### effective means of communication to and from the winder room shaft conveyances carrying persons and the entrance to every shaft that is in use;

### provision for regular testing and inspection of the winding system and its components;

### measures to prevent a detached conveyance from falling back down the shaft; and

### means to prevent uncontrolled contact between conveyances, other equipment installed in the shaft and shaft sides.

## Where automatic winding systems are in use, the control measures must also include:

### monitor the winder from outside the winder house; and

### warning systems to alert persons at the mine of any emergency in the shafts.

## In relation to dual purpose shafts used for winding materials and persons, control measures must also include:

### adequate protection for persons being carried in a shaft conveyance from any material in the shaft and conveyance that may cause injury;

### a means to prohibit persons from being carried in a cage while material is being carried in a skip or the shaft conveyance; and

### means to prevent material or plant carried in a shaft conveyance from protruding from the shaft conveyance and being or becoming unsecured.

* 1. Principal hazard management plans which apply to automatic winding systems must include measures to prevent spillage into the shaft during loading of plant or material onto or into a shaft conveyance.

### **Design registration and design verification**

## [***Jurisdictional Note****: Provision may be made in the mine safety legislation for design registration of powered winding systems, if a jurisdiction so desires.]*

**Winders, slope haulages and hoists**

## The Mine Operator of an underground mine must ensure that:

### a winder or slope haulage used for carrying persons at the mine has at least 2 braking systems;

### braking systems must be capable, at all times, of:

#### bringing the winder, or haulage, to rest safely; and

#### preventing drum movement, under balanced load conditions, when the maximum torque is applied in either direction.

### the brakes are designed and installed to fail to safety;

### the winder must have:

#### an automatic device to prevent the winder overwinding;

#### a device to prevent the descending conveyance from being landed at the lowest entrance to the shaft at a speed exceeding 3.5m/s;

#### a device to indicate the position of each conveyance in the shaft;

#### for a manually controlled winder the speed of which is capable of exceeding 4m/s, a rope speed indicator located on the winder where it can be read by the operator.

### the slope haulage must also have the following:

#### an automatic device to prevent over-travel;

#### a device to indicate the position of each rope hauled train of vehicles in the roadway;

#### for a manually controlled slope haulage the speed of which is capable of exceeding 2m/s, a rope speed indicator located on the slope haulage where it can be read by the operator.

**Controls and safety devices for conveyances**

## The Mine Operator of an underground mine must ensure that:

### the headframe, or tower, of a shaft used for winding at the mine contains:

#### apparatus that is designed and installed so a conveyance or counterweight will stop safely if the conveyance is overwound;

#### safety devices that are designed and installed so a conveyance or counterweight that has been brought to rest, or detached from the winding rope, is prevented from falling down the shaft; and

#### a way of egress to enable persons to safely leave an overwound conveyance.

### the shaft contains guides for each conveyance in the shaft if there is a possibility of uncontrolled contact between the conveyances, a conveyance and equipment installed in the shaft or a conveyance and the shaft side;

### each winder has:

#### if the conveyance has doors, a device preventing the conveyance moving when the doors are not closed correctly; and

#### suspension equipment capable of withstanding stall conditions, or a hook, capable of detaching the ascending conveyance from the rope, if the conveyance overwinds;

### each winder and slope haulage that is not under direct supervision at the mine has suitable automatically operated fire extinguishers for extinguishing fire in the plant's engine room;

### each friction winding system at the mine has a device that causes each of the following to happen before the conveyance, counterweight or rope attachment reaches a permanent obstruction to its passage in the shaft:

#### the power to be cut off from the winder; and

#### the brakes to be automatically applied to bring the winding drum or sheave to rest;

### each winder has a way of automatically synchronising the conveyance's position indicator and automatic safety devices with the conveyance's position; and

### any synchronising adjustment is done only while the brakes are applied and the winder is stationary;

### the speed of a friction winder used at the mine does not exceed the following:

#### for raising or lowering persons - 16m/s;

#### for raising or lowering material - 18m/s;

### the brakes on a friction winder used at the mine:

#### when applied automatically, are not likely to cause the winding rope to slip on the driving sheave;

#### apply automatically when the power to the winder fails; and

#### for a manually controlled winder - are also capable of being applied manually by the winder operator;

### the brakes apply automatically and prevent the winder's operation if the brake linings become worn to an extent that affects the brakes' safe operation;

### the supplier of a winder, slope haulage or hoist for use at the mine is given sufficient details of the operating requirements of the plant to allow the supplier and installer to select and install appropriate plant; and

### plant utilising winders, slope haulage or hoists is tested before being put into operation to verify it meets the operating requirements and a record is kept of the details given to the supplier and installer and the test results.

## If any plant is intended to be used in excess of the operating requirements, the Mine Operator must ensure a design check by a competent person is carried out and any necessary modification is completed before the plant is used in excess of the operating requirements.

## The Mine Operator for a mine at which manually operated winder, slope haulage or hoist equipment is used, must ensure the mine has an appropriate number of mine workers who have the competencies to operate the equipment.

## A person must not operate a manually operated winder, slope haulage or hoist equipment at the mine unless the person has the competencies for operating the equipment and is appointed to operate the equipment.

## If an underground mine uses signals for communicating with a plant operator, the mine's Work Health and Safety Management System must provide:

### a signals code as set out in Schedule B:

#### which is easily accessible by each mine worker at the mine;

#### which is posted in the plant operator's view and at each other place where it is appropriate for persons to contact the plant operator by using the code;

### each person who may need to use the code with training in the code and ready access to the code.

## **Rope for winders and slope haulage**

## The Mine Operator of an underground mine must ensure, so far as is reasonably practicable, that:

### a rope is not used for winder or slope haulage at the mine unless the mine has the rope manufacturer's certificate stating the following about the rope:

#### its date of manufacture;

#### its tensile strength, diameter, length and mass;

#### the class of steel used in its construction.

### a rope is not used for winding or slope haulage at the mine unless the rope's tensile strength has been tested by a nationally accredited testing station;

### for a rope other than a friction winder rope:

#### a sample of at least 2m is cut off the end of the rope during recapping and sent to a nationally accredited testing station for testing its tensile strength; and

#### a certificate stating the tensile strength is obtained from the testing station;

### if the certificate states the tensile strength is less than 90% of the rope's tensile strength when new, the Mine Operator must ensure that the rope is not used for winding or slope haulage at the mine;

### only rope recommended by the manufacturer for winding and slope haulage is used at the mine;

### endless slope haulage system must only use a spliced rope;

### only rope dressing recommended by the manufacturer of the rope is used;

### each rope used at the mine has at least the following safety factor:

#### for a slope haulage rope - 8;

#### for a winder rope, other than a friction winder rope:

##### used for winding persons in a shaft in which persons, materials or minerals may be wound - the safety factor worked out under the following formula:

###### 7.5 - 0.001L

###### where L is the depth of the wind measured in metres; or

##### used for winding materials or minerals in a shaft in which persons, materials or minerals may be wound - the safety factor worked out under the following formula:

###### 5.5 - 0.0003L

###### where L is the depth of the wind measured in metres; or

##### used for winding machinery at less than 2m/s in a shaft in which persons, materials or minerals may be wound - 5; or

##### used for winding materials or minerals in a shaft in which only materials or minerals may be wound - 4.5; or

##### for a friction winder rope used in a shaft in which persons, materials or minerals may be wound by a single rope - the safety factor worked out under the following formula:

###### 7.5 - 0.001L

###### where L is the depth of the wind measured in metres;

##### for a stage rope used in shaft sinking – 6;

### each winder rope on a multi-rope winder is attached at the conveyance or counterweight by a device that loads the ropes as uniformly as practicable;

### if the rope attachments are connected directly to the conveyance or counterweight, devices are provided to adjust rope length and indicate rope tension;

### provide for regular monitoring and non-destructive testing of winder or slope haulage ropes and establishing discard criteria for the ropes;

### unsuitable rope is discarded.

1. **Roads, other vehicle operating areas and traffic management Principal Hazard Management Plan**

*Drafting Note: Mines include a complex mix of roads and other vehicle and mobile plant corridors both above ground and underground. The interaction of road, vehicles, mobile plant and people at mines is therefore a principal hazard in mining operations which must be addressed.*[[5]](#footnote-5)

* 1. The Mine Operator must develop a principal hazard management plan for eliminating the risks associated with the interaction between vehicles and between vehicles and pedestrians in mines and if it is not reasonably practicable to eliminate those risks to minimise them so far as is reasonably practicable.
  2. The principal hazard management plan for roads and other vehicle operating areas at the mine must:

### prescribe measures for ensuring the design, layout, operation, construction and maintenance of each road and other vehicle operating area at the mine enables the safe operation of all mobile plant authorised to travel on the road or in the area;

### set out how the mine operator intends to:

* + - 1. effectively control the risks associated with land adjacent to the road or vehicle operating area at the mine; and
      2. effectively control the risks associated with multiple vehicle interactions, interactions between different types of vehicles (such as heavy and light vehicles, volume of traffic and speed of traffic) and vehicle and person interactions at the mine (including the park up areas, driver access and movement of earth moving machinery); and
      3. effectively control the risks associated with interaction between mobile plant and public traffic; and
      4. effectively control the risks associated with interaction between mobile plant and fixed structures, including overhead and underground power lines, tunnel walls and roofs; and
      5. effectively control the risks associated with remote control vehicles in mines; and
      6. account for the characteristics of the equipment to be used and the conditions, including environmental conditions such as time of day, visibility, temperature and the effects of weather, on the road or in the particular area of the mine; and
      7. ensure that the following matters are given adequate consideration in the design, layout, operation, construction and maintenance of each road:

##### the grade and width of the road at the mine; and

##### the drainage system for the road at the mine; and

##### the particular characteristics of the mobile plant or machinery to be used at the mine, including stopping distances, manoeuvrability, operating speeds, driver position and remote control plant; and

##### the line of the sight for the mobile plant to be used and operated on the road at the mine.

**Design and construction of mine roads**

## The principal hazard management plan at the mine in relation to roads must provide a specification for the design and construction of mine roads in order to enable the safe movement of vehicles about the mine.

## The specification developed must provide for the following in relation to roads:

### barriers;

### curvature;

### grade;

### camber;

### guide posts;

### pavement shape;

### safety berms, windrows and bunds;

### signs;

### surface material;

### width;

### banks and steep drops adjacent to plant operating areas;

### the characteristics of the mine vehicles;

### the types of materials used for road construction;

### the specific mining operations;

### the methods for working at the mine;

### requirements for appropriate intersection design;

### requirement for visibility of road edges at night including adequate lighting; and

### the interface between vehicles and pedestrians.

## The specification which is developed must provide for appropriate control measures relating to the prevention of persons and vehicles from falling over road edges.

## In relation to primary haul roads regularly used for 2-way traffic on surface, the specification must be required to provide for a road width at least 3.5 times the width of the largest vehicle that is regularly using the road.

## *Drafting Note: definitions of “primary haul road” and “width” are in the definition section.*

## The mine operator must ensure that the principal hazard management plan for roads includes a procedure for maintaining and watering mine roads, including managing the risks associated with excessive watering of roads.

**Traffic management**

## *Drafting Note: Traffic management is a critical area for road safety, both surface and underground, and is critical for the safety of vehicles operating on such roads.*

## The principal hazard management plan for roads and other vehicle operating areas must also be required to set out how the mine operator intends to effectively control the risks associated with automated or remote control vehicles in mines. In particular, consideration should be given to the following:

### remote control systems should be designed to mitigate hazardous motions;

### automatic defaulting of remote control systems to an acceptable safe state within a specific time period;

### additional barriers (where assessed as required);

### isolation of power to remote controlled vehicles;

### records of maintenance and testing of remote controlled vehicles;

### safe operating distances for line of sight operations; and

### competency and training of operators of remote controlled vehicles.

## The inspection program at the mine must include roadway inspections.

*Drafting Note: Inspection programs are captured in drafting instruction 9.33 of these drafting instructions*.

## The inspection program for the purpose of roadway and vehicle inspection must include inspections that consider dust, visibility, no-go zones, the installation of strata support where applicable, monitoring of strata measuring devices, the interaction of light and heavy vehicles, the interaction between vehicles, plant and persons, bunding and edge protection systems and must include construction as well as use.

### **Transport of people and items**

## The principal hazard management plan for roads and other vehicle operating areas and traffic management must provide for transporting people and items and materials both underground at the mine and on the surface of the mine.

## The transport management plan must provide for the operation and movement of load shifting equipment.

## The principal hazard management plan must specifically provide for consideration of no go zones.

*Drafting Note: No go zones were specifically identified as a matter of consideration for mine operators in the context of the Blee Inquest in Queensland underground coal mines. Specific requirements for the transport of people and items at mines are required in the mine safety legislation due to the prevalence of such activities in incidents which have caused serious injuries and fatalities.*

## The aspect of the principal hazard management plan relating to traffic management must include a procedure for discharging loads from fixed and mobile plant. The procedure must include provision for the following in relation to dump trucks:

### the design, construction and maintenance of safety berms, windrows and bunds on roads used by the trucks;

### identifying and controlling risks of the trucks over turning;

### safe dump areas and routes; and

### methods of working.

## The aspect of the principal hazard management plan relating to traffic management at an underground mine, must be required to manage risks associated with the transport of people, items and materials, in particular from transport equipment that is operated in the underground parts of the mining operations and locomotives that are operated on the surface part of a mining operation where the surface rail system operates jointly with the underground system, and in particular must make provision for the following matters:

### provision of sufficient means of transport to ensure that risks to persons at mining operations, during access and egress from their place of work, is controlled;

### conditions for the safe operation of the transport equipment;

### transport equipment being used only within its design parameters;

### minimum dimensions and the conditions of roadways on which the transport equipment is to operate;

### the maximum loads that may be carried or towed by the transport equipment, whether by reference to weight, dimensions or other criteria;

### the safe carriage of persons, including the segregation of people from loads, the provision of seating and the wearing of seatbelts or the use of other operator restraint devices unless a risk assessment determines otherwise;

### the safety of persons working, or travelling, in or near roadways used by the transport equipment;

### the safe parking, refuelling (including safe storage of fuel for vehicles) and recharging of the transport equipment;

### periodic inspection and testing of the braking systems of vehicles;

### the suitability and health and safety impact of vehicles on mining operations;

### the appointment of persons who are to operate transport equipment;

### steps to be taken prior to the transport equipment being operated;

### steps to be taken on discovery of a defect in the transport equipment.

1. **Air quality, airborne dust and other airborne contaminants** **Principal Hazard Management Plan**
   1. The Mine Safety Legislation must require that a principal hazard management plan be developed and implemented for air quality, airborne dust and other airborne contaminants at the mine, taking into consideration:
      1. the types of dust and other contaminants (chemical and biological) likely to be in the air from both natural and introduced sources that may result in a risk to health and safety on exposure, including naturally occurring asbestos;
      2. the levels of oxygen, dust and other contaminants in the natural or supplied air in the mine;
      3. the temperature and humidity of the air at the mine;
      4. the length of exposure of workers at the mine to atmospheric contaminants or airborne dust, including taking account of extended shifts and reduced recovery period.
   2. This must include measures for ensuring that the hazards associated with poor air quality, airborne dust and other airborne contaminants are eliminated or minimised, so far as is reasonably practicable, by providing measures for:
      1. ensuring that atmospheric contaminants in workplaces at the mine are maintained at levels below the exposure standard for the atmospheric contaminant and are as low as is reasonably practicable; and
      2. monitoring and assessing atmospheric contaminants at the mine; and
      3. the regular monitoring of atmosphere to eliminate or minimise the risks associated with unsafe concentrations of oxygen, methane and other gases in the air in mines; and
      4. ensuring that monitoring and assessment of the exposure of workers at the mine to an atmospheric contaminant hazard or airborne dust is carried out in a way which complies with all applicable standards; and
      5. the use of appropriate suppression, ventilation or exhaust extraction systems to effectively reduce, dilute or extract atmospheric contaminants; and
      6. ensuring that ventilating air provided for the mine is of sufficient volume, velocity and quality to remove atmospheric contaminants from mining operations and maintain a healthy atmosphere at the mine during working hours; and
         1. ensuring that the supply of air for any ventilating equipment used underground in the mine is from the purest source available; and
         2. monitoring and eliminating, minimising and controlling so far as is reasonably practicable, hazards associated with the formation or emission of toxic, asphyxiant and explosive gases in the mine; and
         3. keeping a plan of the ventilation system at the mine that shows the direction, course and volume of air currents and the position of all air doors, stoppings, fans, regulators and ventilating devices in the mine; and
         4. the suppression of dust from mining operations including the use of dust collection and dust suppression appliances where appropriate.

# **Fire and explosion Principal Hazard Management Plan**

* 1. The principal hazard management plan for fire and explosion must include measures for ensuring that the hazards associated with fire and explosion are eliminated or minimised, so far as is reasonably practicable. This requires:

#### consideration of the potential sources of fire in the mine and of the use presence and storage of certain gases and materials including combustible ore, sulphide dust, coal dust or flammable gas;

#### consideration of potential sources of flammable, combustive and explosive materials, both natural and introduced, including gas, dust, fuels, solvents and timber;

#### potential sources of ignition, fire or explosion, including equipment, electricity, static electricity, spontaneous combustion, lightening, hot work and other work practices;

#### potential for propagation of fire or explosion to other parts of the mine;

#### provision for hot work procedures; and

#### details of the type and location of the systems for prevention, early detection and suppression of fire (including remote monitoring systems) and of the equipment for fire fighting in the mine.

## **Underground Coal Mines**

* 1. Principal hazard management plans that apply to coal mines must include provisions for management of dust explosion which provides measures to eliminate or minimise so far as reasonably practicable the risk of coal dust explosion.
  2. These provisions must include the means by which the mine operator will:

### suppress coal dust explosions and limit their propagation to other parts of the coal mine;

### minimise the production and accumulation of roadway dust;

### limit coal dust generation, including its generation by mining machines, coal crushers and coal conveyors and at conveyor transfer points;

### suppress, collect and remove airborne coal dust; limit coal dust accumulation on roadway and other surfaces in the coal mine roadways; remove excessive coal dust accumulations on roadway and other surfaces in the coal mine roadways; and determine the stonedust or other explosion inhibitor application rate necessary to minimise the risk of a coal dust explosion.

## The principal hazard management plan for fire and explosion must specify control measures to ensure that the monitoring of roadway dust, including the application of an explosion inhibitor, is carried out sufficiently in order to suppress and prevent coal dust explosions.

## The principal hazard management plan relating to dust explosion management must include procedures for:

### regularly inspecting, sampling and analysing roadway dust layers, including laboratory analysis for incombustible material content; and

### applying stone dust or another explosion inhibitor for suppressing coal dust explosion;

## In order to comply with the procedure referred to in the drafting instruction above:

### the dust sampling and analysis mentioned above to be carried out at least at the following intervals:

#### For a strip or spot sample of dust mentioned in subparagraph (1) or (2) of drafting instruction 18.8 below – weekly;

#### For a strip sample of dust mentioned in subparagraphs (1), (2), (3) or (4) of drafting instruction 18.8 below – monthly; and

#### For a strip sample of dust mentioned in subparagraph (5) of drafting instruction 18.8 below – every third month.

### Sampling is to require:

#### samples must be taken where practicable, from the complete perimeter of the roadway and the structures in it, and where possible, over a length of roadway of at least 45 metres, by a method of strip sampling by which the dust is collected from a succession of transverse strips as nearly as possible of equal width and equally spaced, not more than 5 metres apart and of an aggregate area of not less than 1 per cent of the total area sampled; and

#### if it appears that dust on the floor of a roadway contains a different incombustible content from dust on the roof and sides of the roadway, the dust on the floor must be sampled and tested separately from the dust on the roof and sides; and

#### each sample must be collected as near as practicable from a maximum depth of 5 millimetres.

### If a location is re-sampled, the individual strips from which the increments for a strip sample are taken must not coincide with those from which a previous sample has been taken.

## The mine operator must ensure both the collection of dust samples and the analysis of each sample mentioned in drafting instruction 18.4 subparagraphs (3)(b) and (c) above to be carried out in a registered laboratory. Four potential procedures for doing so are to be detailed in a code of practice.

## For the purpose of the requirements in drafting instructions 18.4 and 18.7 immediately above, the mine operator of an underground mine must ensure that the content of incombustible material in roadway dust at the mine is kept at or above the following concentration levels:

### For dust in a panel roadway within 200 metres outbye the last completed line of cut throughs in the panel – 85%;

### For dust in a 200 metre section of panel roadway within 400 metres of a long wall face – 85%;

### For dust in a panel roadway within 200 metres from the main roadway, if the above subparagraphs (1) and (2) of this drafting instruction 18.8 do not apply to the 200 metre section of the roadway – 80%;

### For dust in a return roadway not mentioned in subparagraphs (1) to (3) of this drafting instruction 18.8 above – 80%;

### For dust in a return roadway more than 200 metres outbye the last completed cut through in the panel – 70%

### For dust in an intake roadway not mentioned in subparagraphs (1) to (4) of this drafting instruction 18.8 above – 70%.

## The Mine Operator at a coal mine must ensure:

### each 30 metres length of a roadway that is being driven at the mine is stone dusted, or treated with another proven coal dust explosion inhibitor immediately after the length is driven; and

### each part of the roadway is stone dusted, or treated with another proven coal dust explosion inhibitor within 24 hours after the part is driven.

## The requirements in drafting instruction 18.9 immediately above do not apply to dust in a roadway where there is a sufficient natural make of water associated with the mining operation to prevent a coal dust explosion

## The requirements with respect to the content of incombustible material in roadway dust and in particular the concentration levels outlined above, shall be stated in the mine safety legislation as not applying to dust in a part of the mine mentioned in those areas subject to concentration limits if:

### An explosion inhibitor, including, for example, a chemical, is used as a coal dust suppressant in combination with stone dust in a particular part of the mine; and

### A physical test, other than a laboratory test, of the combination carried out by a nationally accredited testing laboratory has shown the combination to effectively suppress a coal dust explosion. Such an explosion inhibitor is a proven coal dust explosion inhibitor.

## If an analysis of a dust sample from an underground mine shows that the dust does not comply with the incombustible material content for the dust as set out above, the Mine Operator at a coal mine must ensure the following:

### the area from which the sample was taken is retreated with stone dust or another explosion inhibitor within the following period after the Mine Operator receives the analysis result:

#### for dust mentioned in subparagraphs (1) and (2) of the concentration limits in drafting instruction 18.8 above or in drafting instruction 18.8 subparagraph (3) – 12 hours; or

#### for dust mentioned in subparagraphs (4) or (5) concentration levels outlined in drafting instruction 18.8 above – 7 days; and

### a record is kept of the date and time when the area was retreated.

## The mine operator at a coal mine must ensure the Deputy for the area is given notice of the analysis result.

## The mine operator at a coal mine must ensure a record is kept of following for each roadway dust sample taken at the mine:

### the date it was taken;

### the location from which it was taken;

### its incombustible material content; and

### the method used for analysing the sample.

***Explosion risk zones (ERZ) at underground coal mines***

## The mine safety legislation is to provide that mine operators for underground coal mines be required to adopt ERZs. ERZs are required to be prescribed as they provide the highest level of safety.

## The Mine Operator must ensure a risk assessment is carried out to identify the location and type of each ERZ at the mine.

## *Drafting Note: Definitions of ERZ, ERZ0, ERZ1 and NERZ are in the definition section.*

## **Places where methane detectors must be located**

## The mine operator must ensure a place mentioned in these drafting instructions has automatic methane detectors located as specified.

## **Intake airways**

## At least one automatic methane detector must be located in each intake airway at the interface between:

### a NERZ and an ERZ1; and

### two NERZs.

## A detector located at an interface between a NERZ and an ERZ1 must:

### when the general body concentration of methane detected at the interface exceeds 0.25% - automatically activate a visible alarm; and

### when the general body concentration of methane detected at the interface exceeds 0.5% - automatically trip the electricity supply to non-intrinsically safe plant in:

#### the ERZ1 and NERZ; or

#### if the NERZ has been subdivided – the ERZ1 and the subdivided part of the NERZ adjacent to the ERZ1.

## A detector located at the interface between a NERZ and an ERZ1 must be a self-contained unit or part of the gas monitoring system for the mine.

## A detector located at an interface between two NERZs must:

### automatically activate a visible alarm when the general body concentration of methane detected at the interface exceeds 0.25%; and

### if the NERZ has been subdivided – automatically trip the electricity supply to non-intrinsically safe plant in the adjacent subdivided part when the general body concentration of methane detected at the interface exceeds 0.5%.

## The alarm mentioned in sections 18.19(1) and 18.21(1) must be visible at the interface.

## **Main return airway and return airway in a ventilation split**

## At least one automatic methane detector must be located in:

### each main return airway; and

### each return airway in a ventilation split.

## The detector must automatically activate a visible alarm when the general body concentration of methane detected in the return air exceeds the percentage stated in the mine’s principal control plan for ventilation as the percentage that must not be exceeded before the detector activates the alarm.

## **Longwall face**

## At least one automatic methane detector must be located at the following places:

### the intersection between the longwall face and an intake airway;

### the intersection between the longwall face and the return airway.

## A detector located between the longwall face and an intake airway must automatically trip the electricity supply to longwall equipment in the longwall face and intake airway when the general body concentration of methane detected at the intersection exceeds 2%.

## A detector located between the intersection between the longwall face and the return airway must automatically trip the electricity supply to longwall equipment in the longwall face and return airway when the general body concentration of methane detected at the intersection exceeds 2%.

## **Action to be taken if methane is detected or methane detector is non-operational**

## *Explosion protected electrically powered loader*

## If a general body concentration of methane exceeding 1.25% is detected around an explosion protected electrically powered loader that is not fitted with an automatic methane detector, the loader operator must switch off the electricity supply to the loader’s trailing cable.

## *Explosion protected vehicle powered by a battery, or internal combustion engine*

## This section applies to an explosion protected vehicle powered by a battery, or internal combustion engine and fitted with an automatic methane detector.

## If a general body concentration of methane of at least 1% is detected around the vehicle, the vehicle operator must immediately withdraw the vehicle to a place where the general body concentration of methane is less than 1%.

## If a general body concentration of methane of at least 1.25% is detected around a vehicle constructed before 1 July 2001 that is not fitted with a methane detector, the vehicle operator must immediately switch off the electrical motors or internal combustion engine.

## *Other explosion protected electrical plant*

## This section applies to explosion protected electrical plant supplied with electricity by a trailing cable, other than plant:

### mentioned in the two previous subsections above; or

### fitted with an automatic methane detector; or

### having explosion protection category Ex ia.

## If a general body concentration of methane of at least 1.25% is detected around the plant, the person detecting the methane must immediately switch off the electricity supply to the equipment’s trailing cable.

## *Non-explosion protected vehicle powered by a battery or an internal combustion engine*

## If the automatic methane detector fitted to a non-explosion protected vehicle powered by a battery or an internal combustion engine fails in service, the vehicle operator must immediately park the vehicle.

## *Ventilation spilt or main return airway*

## A mine operator of an underground mine must have a procedure for taking action when methane, at a general body concentration stated in the procedure, is detected at a ventilation split or main return airway.

## **Action to be taken if methane detector activates or is non-operational**

## An underground mine operator must have a procedure for taking action when any of the following happens:

### an automatic methane detector fitted to a coal cutter, continuous miner, tunnel boring and road heading machine, a longwall shearer, mobile bolting machine, electrically powered loader, load-haul dump vehicle or other explosion protected plant powered by battery or internal combustion engine trips the electricity supply to the machine, vehicle or plant or stops its internal combustion engine;

### a methane detector mentioned in paragraph (1), other than a methane detector fitted to a longwall shearer, fails in service;

### a methane detector located at the interface between a NERZ and an ERZ1, or between adjoining NERZs, fails in service or is being tested or relocated.

## The procedure may provide that, if an event mentioned in 18.36(1) or (2) happens to a machine or vehicle (other than a longwall shearer) in an ERZ1, the methane detector may be temporarily overridden to allow the machine or vehicle to be moved, but only if:

### the general body concentration of methane around the machine or vehicle is less than 1.25%; and

### a portable methane detector is used to continuously monitor the concentration. ‘

## The procedure may also provide that if an event mentioned in 18.36(2) happens to a longwall shearer, the methane detector may be temporarily overridden to allow the machine to be operated to allow movement to a secure place along the face or at the gate ends, but only if:

### the general body concentration of methane around the machine is less than 1.25%; and

### a portable methane detector is used to continuously monitor the concentration.

## The procedure may also provide that:

### if an event mentioned in 18.36(2) happens to a relevant machine or vehicle being used in a NERZ, the operator may continue to use the machine or vehicle only if:

#### the general body concentration of methane around the machine or vehicle is less than 0.5%; and

#### the place where the machine or vehicle is located is continuously monitored by a person using a portable methane detector; or

### if an event mentioned in 18.36(3) happens, the methane detector:

#### must be replaced or repaired as soon as practicable; and

#### may be overridden temporarily to allow operations to continue in the zones until the detector is replaced or repaired, but only if the conditions mentioned in the drafting instruction immediately below are complied with.

## For subsection 18.39(2)(b), the conditions are:

### a person uses a portable methane detector to continuously monitor for methane:

#### if the event involves a methane detector—at the location of the methane detector; or

#### if the event involves more than one methane detector at an interface—by moving between the methane detectors at the interface that have failed or are being tested or relocated; and

### the electricity supply to the affected zones can be readily tripped when the general body concentration of methane at the location of a methane detector being monitored as required under paragraph (1) exceeds 0.5%.

## In this section:

### ***relevant machine*** means a machine supplied with electricity by a trailing cable.

### ***relevant vehicle*** means an explosion protected vehicle powered by a battery or internal combustion engine.

**Record of tripping of electricity supply**

## The mine operator must ensure a record is kept of the date and time of the event if an electricity supply is tripped by an automatic methane detector:

### located at the interface between a NERZ and an ERZ1, or between adjoining NERZs; or

### fitted to a non-explosion protected vehicle.

**General back-up for gas monitoring system**

## The principal hazard management plan fire and explosion must provide for the use of portable gas detectors to manage risk in the event of a failure or the non-operation of the gas monitoring system.

## The mine operator must have a procedure for using the portable gas detectors in the event of the failure or non-operation.

## If the system fails or becomes non-operational, the mine operator must ensure coal mining operations are not carried out in the part of the mine affected by the failure or non-operation unless the part is continually monitored, using portable gas detectors, to achieve an acceptable level of risk.

**Withdrawal of persons in case of danger caused by failure or non-operation of gas monitoring system**

## The mine operator must ensure all persons are withdrawn to a place of safety when a coal mine is dangerous. A part of an underground mine is taken to be dangerous if the part is affected by the failure or non-operation of the gas monitoring system and the mine does not have:

### a procedure for using portable gas detectors; or

### sufficient portable gas detectors to continually monitor the part to the extent necessary to achieve an acceptable level of risk.

**Auxiliary, or booster, fan**

## An auxiliary or booster fan must be protected by at least one methane detector to detect the general body concentration of methane at the fan.

## For an **auxiliary** fan, the detector must be an automatic methane detector that trips the electricity supply to the fan when the concentration exceeds 2%.

## For a **booster** fan, the detector must, when the concentration exceeds 1.25%, automatically activate an audible and visible alarm located in a place that allows the necessary action to be taken promptly.

## If the detector protecting an **auxiliary** fan fails or is otherwise non-operational, the underground mine manager must ensure that, while the fan is operating, a person:

### continuously monitors the general body concentration of methane at the fan by using a portable methane detector that gives an audible and visible alarm when the concentration exceeds 1.25%; and

### disconnects the electricity supply to the fan when the concentration exceeds 1.25%.

## This section does not apply to an auxiliary or booster fan for a drift or shaft being driven from the surface in material other than coal.

### ***Signposting ERZ boundaries in underground coal mines***

## The mine safety legislation must provide for the signposting of ERZ boundaries in underground coal mines. Such signposting requirements should be required in circumstances where a person or machine can physically pass through a boundary between a NERZ and an ERZ1 or between an ERZ1 and an ERZ0. Where either of those circumstances is possible, the Mine Operator must ensure the actual location of the boundary is signposted in each intake airway and machine access leading into:

### for a boundary between a NERZ and an ERZ1, the ERZ1; or

### for a boundary between an ERZ1 and an ERZ0, the ERZ0.

## A signpost need not change if:

### a temporary change in conditions results in a temporary change in the boundary location; and

### *DRAFTING NOTE***:** *An example of temporary change in conditions for drafting instruction 18.18(1) is a major goaf fall causing a sudden temporary flush of methane to change an ERZ1 to an ERZ0 or a NERZ to an ERZ1.*

### the Mine Operator ensures that appropriate precautions are taken to ensure control of persons and machines entering an ERZ affected by the change.

## Where an underground mine’s ERZ boundaries are signposted in accordance with the requirements of drafting instruction 18.17 above, the Mine Operator must ensure that a plan showing the boundaries is displayed at the surface of the mine.

## The Mine Operator of a coal mine must ensure the plan is updated at the end of each shift to reflect any changes in the boundary locations required to be signposted under drafting instruction 18.17 above.

*DRAFTING NOTE****:***  *Each jurisdiction is to develop appropriate transitional arrangements which will allow duty holders in each jurisdiction to progressively comply with the drafting instructions for ERZs set out above. Where appropriate, the regulator may grant permission for an underground coal mine to adopt an alternative approach to areas where no explosion risk exists. The ability to grant an exemption from adopting the ERZ strategy set out in these drafting instructions above, in exchange for the adoption of an alternate strategy, recognises that in relation to some mines, adopting the ERZ system is neither practical nor necessary*.

## *DRAFTING NOTE: The various jurisdictions will need to consider any further ramifications of the above drafting instructions for explosion risk zones. A detailed assessment of the implications of the recommendation to adopt the explosion risk zones is needed in order to identify any flow‑on consequences. Such areas to be considered include the following:*

### *Electricity and power tripping for methane gas levels;*

### *Use of explosion protected and non‑explosion protected equipment;*

### *Reporting of incidents in relation to ERZ;*

### *Minimum ventilation requirements, for example, velocity and monitoring on machinery;*

### *Inspections;*

### *Training and supervision;*

### *Withdrawal conditions; and*

### *Explosion barrier positioning.*

***Record of roadway dust sampling***

## The Mine Operator of a coal mine must ensure that the results of the analysis of incombustible material content is marked on a plan of the mine.

## *Drafting note: The above control measures which are currently prescribed in legislation are proven ways of ensuring the risk of coal dust explosion is minimised. Identifying these key requirements will ensure that the management plan relating to dust explosion is effective and complete.*

## The operator of an underground coal mine must ensure:

#### an explosion barrier is installed and maintained in the part of any roadway (other than part of a single entry roadway) containing a conveyor belt within a face zone;

#### an explosion barrier is installed and maintained in the part of any return roadway (other than part of a single entry roadway or a part of a roadway referred to in (a)) within a face zone; and

#### adequate explosion suppression measures are installed and maintained in single entry roadways.

## An explosion barrier is taken to have been installed in a part of a roadway if the most inbye part of the barrier is in the part of the roadway.

## When installing explosion barriers, the Mine Operator must:

### determine through a risk assessment whether to install a:

#### fixed distributed; or

#### advancing distributed; or

#### fixed concentrated; or

#### advancing concentrated explosion barrier.

## Where a distributed barrier is used:

### it must:

#### be kept as near as possible to the face and not further outbye than 100 metres from the face and not further outbye than 30 metres from the conveyor belt feeder or boot-end in a conveyor roadway, and not further outbye than 30 metres from a trickle duster, auxiliary fan (where used) or the last line of cut-throughs (where no auxiliary ventilation fan is used).

#### be loaded with stonedust or water, to not less than 200 kg per square metre of roadway cross-sectional area.

### the spacing between consecutive rows must be such that the mass of water or stonedust in the volume of roadway occupied by the barrier, is not less than 1 kg per cubic metre.

## Where an advancing distributed bag barrier is used:

### the barrier must consist of four sub-barriers, installed over a maximum distance of 120m of continuous roadway; and

### three complete sub-barriers must be in position at all times and the following distances maintained:

#### the first sub-barrier closest to the last through road must not be installed closer than 60m and not further than 120m from the last through road;

#### the fourth sub-barrier furthest from the last through road must be installed not more than 120 m from the first sub barrier;

#### the two intermediate sub-barriers must be equidistant between the first and fourth sub-barriers;

#### the maximum distance between sub-barriers must not exceed 30m.

## Where an advancing concentrated bag barrier is used:

### the barrier must be in two barriers each 20 to 40 m long which leap frog to maintain a distance between the last through road and the first row of bags greater than 70 m but less than 120m; and

### the second barrier must start no further than 120m from the end of the first barrier. The stone dust required is calculated on the basis of Ma=100kg/m2 of roadway cross sectional area.

## Where a fixed distributed bag barrier is used:

### a continuous array of barrier bags must be place in a roadway over its entire length;

### the dust density must be Mv=1kg/m3; and

### the distance between the start of the continuous distributed bag barrier and the last through road must not exceed 120m.

## Where a concentrated explosion barrier is used:

### it must be kept within 200 metres of the face but not closer than 60 metres to the face;

### be loaded with stonedust or water, to not less than 200 kg per square metre of roadway cross-sectional area;

### the spacing between consecutive rows shall be such that the mass of water or stonedust in the volume of roadway occupied by the barrier, is not less than 1 kg per cubic metre.

## The Mine Operator must determine through a risk assessment the need for any additional barriers.

## The Mine Operator must ensure the **design** of the explosion barrier is effective to eliminate so far as reasonably practicable a coal dust explosion from travelling:

### where a bag explosion barrier is installed the design of the explosion barrier must have the following characteristics:

#### each bag must contain 6kg of dry stone dust;

#### the horizontal distance between hooks of the bags in a row must not be less than 0.4m and not greater than 1.0m;

#### the distance between the bags and side of the pillar must not be greater than 0.5m;

#### for roadways up to 3.5m high each row must have a single level of bags suspended with the hooks not more than 0.5 from the roof;

#### for roadways between 3.5m and 4.5m high the bags must be distributed evenly between two layers suspended with the hooks at 0.5m and 1.0m below the roof level;

#### for roadways between 4.5m and 6.0m high the bags must be distributed evenly between two layers suspended with the hooks at 0.5m, 1.0m and 1.5m below the roof level;

#### the distance measured along the roadway between rows of bags must be not less than 1.5m and not more than 3.0m;

#### the total mass of stone dust used in the barrier is based upon the values of either Ma or Mv where Ma is 100kg/m2 of roadway cross sectional area and Mv is 1kg/m3 of roadway volume between the extremities of the barrier. The total mass of stone dust must be the greater amount based on the values of Ma and Mv;

#### the total proportion of broken bags must not exceed 10% of bags in any sub-barrier; and

#### only bag and hook arrangements complying with South African Patent No.95/10595 and South African Registered Design No F95/1238 may be used.

### Where any other type of explosion barrier is installed the design of the explosion barrier must have the following characteristics:

#### is rectangular, and is made of timber or sheet metal with a height of at least 150mm.Two timbers or metal purlins form the front and back of the frame, and are fixed by cross-pieces so that the frame measures no more than 200mm from front edge to back edge;

#### the frame rests on rigid supports fixed on each side of the roadway, but the frame is not fixed to the supports; and

#### dust boards or trays must rest on the frame aligned in the direction of the roadway, and are free to move or purlins placed on their edge can ‘roll’ and displace the trays.

## The Mine Operator must ensure that:

### troughs used in water barriers are made and tested to a German standard (DIN 21576) dated 1969 or British Coal Specification 733: 1991;

### water troughs are of 80L capacity or 40L capacity;

### an explosion barrier is not be installed in a cavity in the roof; and

### any explosion barrier in a roadway with a conveyor is installed with a major part of the barrier no lower than the top of the conveyor belt.

## The Mine Operator must make enquiries with any supplier or manufacturer of any explosion barrier to ensure it is fit for purpose, having regard to:

### proven design criteria;

### results of empirical testing; and

### relevant guidance or technical specifications made available by the regulator or other authoritative source.

# **Gas outbursts Principal Hazard Management Plan**

## The Mine Operator must develop, implement and maintain a documented Principal Hazard Management Plan for minimising the risks in Mining Operations arising from gas outbursts, taking in to consideration:

### the potential for gas release into the working area of a mine from both natural and introduced sources in a concentration that could lead to fire, explosion or asphyxiation;

### the potential for accumulation of gases in existing and abandoned areas of the mine;

### the nature of the gas that could be released;

### gas levels in the material being mined; and

### gas seam pressures.

## The risk of gas outburst exists where the total insitu gas content and gas composition, measured in accordance with AS 3980 or an equivalent standard, is greater than 9 cubic metres per tonne of methane or 5 cubic metres per tonne of carbon dioxide, or for a mixture of these two gases a gas content in the proportion of the percentages of each gas between these two limits.

## The Principal Hazard Management Plan for gas outbursts at the Mine must contain the determined risk of gas outbursts, measuring such factors as the in-situ methane and carbon dioxide gas levels per tonne of material/coal and the specific geological risk features identifiable in the area to be mined.

## Without limiting the generality of the above, the Principal Hazard Management Plan must provide for control processes for eliminating or minimising the risk of gas outburst in underground mining including monitoring of:

### carbon dioxide and methane gas levels,

### seam gas pressure and content;

### ventilation;

### gas drainage;

### pre-drainage of coal seams;

### in-seam drainage and post drainage;

### strata de-stressing;

### bore hole surveying; and

### mining development rates,

### compared with the pre-determined gas thresholds and the mining rates adopted in the principal hazard management plan.

## The principal hazard management plan must ensure that the highest level of control relevant to the risk which has been identified is implemented, including worker physical protection and remote mining.

## In determining such risks and controls, the Mine Operator must gather information by undertaking activities of in-situ gas sampling, geotechnical investigation and analysis, and statistical analysis of the data obtained, as part of a technical review, in order to determine what gas thresholds for safe mining should be applied at the mine.

## The Principal Hazard Management Plan for gas outbursts must ensure that a Permit to Mine system is implemented by the mine operator. A Permit to Mine system must include the following requirements:

### at least 2 hourly readings of the general body gas concentration at the face area;

### constant identification of geological structures;

### modification of the rate of roadway advance;

### survey and sample drill holes;

### training of workers in the identification of outburst signs and dangers;

### training of workers in outburst rescue and escape procedures; and

### provision of physical protection for workers operating continuous miners.

## A Permit to Mine system must ensure that mining is only undertaken after verification by a designated competent person that all information necessary for work health and safety has been obtained, and all the necessary control measures have been implemented.

# **Spontaneous Combustion Principal Hazard Management Plan**

## The Mine Operator must develop a principal hazard management plan for spontaneous combustion where the risk of spontaneous combustion at the mine exists.

## The Mine Operator must conduct a risk assessment to determine whether the risk of spontaneous combustion exists.

## Without limiting the generality of 20.2 (the above requirement), in undertaking the risk assessment, the Mine Operator must have regard to the following indicators:

### gas analysis based indicators and

### sensory or observation based indicators.

## Without limiting the generality of 20.2, the Mine Operator’s risk assessment must include, but is not limited to, the following matters:

### evaluating the spontaneous combustion related history of the mine and any adjacent or prior operations in the same seam and/or coal measures;

### evaluating external information including:

#### review of the industry experience,

#### regular review of available information, and

#### regular review of emerging technology.

## The Mine Operator must maintain, for the life of the mine, written records of all spontaneous combustion events including surveyed locations and other details of all known incidents on spontaneous combustion on or in the vicinity of the mine and mine specific spontaneous combustion characteristics.

## The Mine Operator must use the information gathered through the risk assessment process to develop mine specific gas analysis and sensory indicators of spontaneous combustion risk for the mine pursuant to 20.3.

## The Mine Operator must consider the indicators when making an evaluation/decision as to whether the risk of spontaneous combustion exists.

## The Mine Operator must use the indicators developed for the mine as an internal standard against which the risk of spontaneous combustion is assessed.

## The principal hazard management plan for spontaneous combustion which must contain:

### details of the risk assessment

### information which adequately describes the mine and defines the “mine characteristics” as they relate to the control of spontaneous combustion

### detail of the authorities and duties of all persons who have responsibilities under the Principal Hazard Management Plan.

### details of strategies to ensure that all persons who have responsibilities under the Principal Hazard Management Plan have up to date knowledge of spontaneous combustion prevention, detection and control

### details of an inspection program for spontaneous combustion that includes taking recordings and making a written report on findings

### details of strategies to ensure all workers are trained in to maintain standards and work practices that may impact on potential spontaneous combustion heatings

### details of an audit program detailing a schedule of internal and external audit to ensure the effective verification of the plan.

### a review schedule that ensures the plan’s continued suitability and effectiveness in managing spontaneous combustion related risks at the mine.

### details of all controls to eliminate or manage the risk of spontaneous combustion

### details of the monitoring program that triggers any control

### details of actions to be taken in response to a spontaneous combustion event

### detail of corrective action to be taken where non conformance with the plan is identified.

**Audit**

## The Mine Operator must ensure that internal audits are conducted by persons independent of those with direct responsibility for implementing the plan.

## External audits must be conducted by persons independent of the mine’s operations.

## The mine operator must ensure that records of all audits are maintained for 7 years.

**Review**

## The Mine Operator must prepare a review protocol conforming to the following requirements:

### a re-evaluation of the spontaneous combustion related risks and all aspects of the Plan;

### identify persons to participate in reviews (indicate who should decide if significant change has occurred, and to what criteria that decision is to be made);

### define time based and event based review triggers including:

#### failure of the plan to control spontaneous combustion,

#### significant change in mining systems,

#### change of equipment,

#### change of management structure.

## The Mine Operator must ensure that records of all reviews are maintained for 7 years.

## The Mine Operator must ensure that where the conduct of any review indicates that the plan is no longer suitable and effective in managing spontaneous combustion related risks corrective action is taken to amend the plan to make it suitable and effective for this purpose.

**Controls**

## Where a risk of spontaneous combustion exists, the Mine Operator must consider the following matters when developing controls to effectively eliminate the risk of spontaneous combustion so far as reasonably practicable:

### mine design parameters including how the mine design and/or mining methods control the spontaneous combustion hazard;

### available external resources such as off-site or mobile gas analysis services, Mines Rescue response, inertisation unit, or external expertise;

### Spontaneous Combustion Treatment - including inertisation, flooding, sealing;

### Goods/Services Acquisition Control – ensuring the equipment used for the management of a spontaneous combustion event to be fit for purpose and any contracted services are consistent with the plan; and

### mine standards and procedures based on the site specific details, developing mine standards, and procedures for the following:

#### seal standards and maintenance;

#### sealed area monitoring;

#### ventilation monitoring;

#### gas monitoring system and locations;

#### gas sampling and analysis;

#### physical indicator observation and reporting; and

#### inspection.

**Monitoring**

## The Mine Operator must monitor for signs of spontaneous combustion and put in place appropriate controls triggered by the monitoring.

## The Mine Operator must consider the following monitoring strategies:

### Early detection of the onset of spontaneous combustion including gaseous & physical indicators (such as smell, haze, etc) and detection of changes in the mining environment;

### Inspections;

### Gas Sampling and Analysis –including bag sampling; and

### Continuous Gas Monitoring such as continuous monitoring from boreholes or seals, or within mine airways and goaves, including the appropriate calibration of gas monitoring instruments.

**Response**

## The Mine operator must define the triggers which will invoke responses to manage spontaneous combustion events.

## The Mine Operator must ensure that response action is taken to mitigate the effects of spontaneous combustion events.

## The Mine Operator must ensure that personnel responding to spontaneous combustion events have sufficient authority to implement decisions and appropriate expertise.

## The Mine Operator must maintain, for the life of the mine, an event log to record issues, decisions, actions and consequences of those actions as a result of a spontaneous combustion event.

## The Mine Operator must ensure that withdrawal is triggered when potentially life threatening situation arises from a spontaneous combustion event.

## The Mine Operator must develop and implement processes for the rapid sealing of areas of risk in response to a spontaneous combustion event.

## Without limiting the generality of the above requirement, the processes for the rapid sealing of areas of risk in response to a spontaneous combustion event referred to above must include:

### details of sealing procedures and type D seal design; and

### minimum inventory of materials to be maintained on-site, or to have guaranteed ready availability, at all times.

**Corrective Action**

## The mine operator must maintain, for 7 years, written records of all non conformances with the Principal Hazard Management Plan, causes of non-conformance and corrective action taken.

# **Ionising Radiation Principal Hazard Management Plan**

## The Mine Operator must develop, implement and maintain a documented Principal Hazard Management Plan for minimising the risks in Mining Operations arising from exposure to all sources of ionising radiation, taking into consideration:

### potential sources of ionising radiation from both natural and manufactured sources, including from dust, air, water, ore and waste from mining and drilling operations, stack emissions, ventilation system emission, surface contamination, core and sample storage and monitoring equipment;

### type of radiation (being alpha, beta or gamma);

### levels of radiation, including background radiation;

### potential for and length of exposure; and

### the appointment of a competent site radiation safety officer.

# **PART 5 – PRESCRIBED PRINCIPAL CONTROL PLANS**

*Note: The following are the prescribed Principal Control Plans:*

#### *Mechanical Engineering Control Plan*

#### *Electrical Engineering Control Plan*

#### *Ventilation Control Plan*

#### *Explosives Control Plan*

#### *Health Control Plan*

#### *Emergency Response Control Plan.*

# **Mechanical Engineering Control Plan**

## The work health and safety management system for a mining operation must include a Mechanical Engineering Control Plan.

## A Mechanical Engineering Control Plan is a plan covering the life cycle of mechanical plant and structures, and mechanical engineering practices, at the operation, that is developed, implemented and periodically reviewed:

##### to control risks to health and safety from mechanical plant and structures over their life cycle;

##### to prevent injury to people from sources of mechanical energy;

##### to provide safeguards to prevent the release of uncontrolled mechanical energy and to prevent unintended operation of mechanical plant;

##### to prevent catastrophic failure of mechanical plant or structures;

##### to prevent uncontrolled fires being initiated or fuelled by mechanical plant or structures;

##### to prevent initiation of gas or coal dust explosions by mechanical energy;

##### to minimise exposure to toxic or harmful materials associated with mechanical plant and structures;

##### to provide safeguards for mechanical plant and structures, with a probability of failure appropriate to the degree of risk posed by any mechanical plant or installation;

##### to generally provide the means by which the safety of mechanical plant and structures is managed.

##### *Drafting Note: Definition of “mechanical energy” is in the definition section.*

## The mechanical engineering control plan for a mining operation must make provision for the following:

#### the standards of engineering practice for mechanical plant and structures throughout their life cycle at the operation, including the following:

##### arrangements for the acquisition and operation of fit-for-purpose plant and structures;

##### inspection and testing systems to ensure plant and structures are safe to operate;

##### arrangements for the maintenance, repair and alteration of plant and structures;

##### the competence of people who may deal with plant and installations during the life cycle of the plant and structures at the operation;

##### arrangements for the supervision of people installing, commissioning, maintaining and repairing mechanical plant to be undertaken by people with appropriate competence;

##### safe work procedures for people who may deal with plant and installations during the life cycle of the plant and structures at the operation;

##### identification, assessment, rectification and management of defects;

#### the safe operation of conveyors, winding plant and mobile plant and dredges;

#### the safety of structures and mechanical plant;

#### the fitting of mechanical operator protective devices to protect from the risk of mobile plant overturning, objects falling on or coming into contact with the operator and the operator being ejected from the seat, in the form of the following:

##### rollover protection and falling object protection on mobile plant that is suitable for the intended surface and the underground environment;

##### seat belts or other operator restraint devices on mobile plant;

##### protective canopies on continuous miners when controlled by an on-board operator;

#### the safe use and storage of pressurised fluids (including managing the risks associated with compressed air and pressurised hydraulic fluids);

#### means for the prevention, detection and suppression of fires on mobile plant and conveyors;

#### the control of diesel-engine plant and equipment, including the following:

##### the use only of plant and equipment containing a registered diesel engine system in the underground parts of the coal operation [***Jurisdictional Note****: WA and QLD will not register the plant*];

##### the maintenance of explosion-protected plant and equipment in an explosion-protected state;

#### the use of fire-resistant hydraulic fluids in high risk applications in the underground parts of the operation;

#### management systems to control diesel pollutants in the underground parts of a operation; and

#### arrangements for safe hot work including the use of cutting and welding equipment.

### **Diesel additives**

## The mine operator at a mine must, so far as is reasonably practicable, ensure requirements that fuel additives do not increase the health and safety risks to underground workers.

## In determining whether such an increase in the risk is posed by fuel additives, a mine operator must conduct comparison testing on underground diesel engines at appropriate load points.

## The mine operator must regularly test undiluted exhaust emissions from an internal combustion engine used underground and must test the surrounding atmosphere in which it is used.

## *Note: The testing of diesel emissions should be consistent with codes of practice, guidelines and Australian and New Zealand Standards including, for example, MDG 29, Guideline for the management of diesel engine pollutants in underground environments, April 2008; AS/NZS 3584.1:2008 Diesel engine systems for underground coal mines – Fire protected – Heavy Duty; AS/NZS 3584.2:2008 Diesel engine systems for underground coal mines – Explosion Protected; and AS/NZS 3584.3:2005 Diesel engine systems for underground coal mines – Maintenance. Consideration should be given to the development of a consolidated code of practice.*

## The mine operator of a mine must minimise, as far as reasonably practicable, the exposure of workers to diesel particulate matter.

## The mine operator must, so far as is reasonably practicable, ensure that the risks associated with combustible liquids stored underground are adequately managed and in particular, controlled.

## The mine operator at an underground mine must ensure that:

### items with flashpoint less than 61 degrees Celsius are controlled in an underground mine; and

### flammable material with a flashpoint of 23 degrees Celsius or less is not stored in the underground parts of the mine except in a fire proof room, compartment or box.

## *DRAFTING NOTE:* ***Flashpoint*** *is measured by the Pensky-Martens closed-cup method. The use of this definition for flashpoint provides for a measure which will achieve consistency of measurement and data enabling regulator review and recording*.

## **Belt conveyors**

## The Mine Operator must ensure that risks arising from the design, installation, use, inspections and maintenance of belt conveyors are controlled so far as is reasonably practicable including:

### risks arising from starting conveyors including pre-start warnings;

### the fitting of emergency stop system capable of being activated from any point along the length of the conveyor where persons have access;

### certified fire resistant and antistatic conveyor belting, drum lagging and conveyor accessories for an underground mine;

### protecting persons near or travelling under a conveyor against the risk of being struck by a falling object;

### the interaction of people and conveyor belts including provision of safe crossing of conveyor belts.

### **Compressed air in coal mines**

## The Mine Operator of an underground coal mine must ensure that the Work Health and Safety Management System at an underground coal mine includes provisions for the electrical bonding to earth of compressed air equipment, hoses and pipes that are likely, during operation, to develop static electrical charges capable of causing an electric shock to a person or a spark.

## **Using plant powered by internal combustion engines for coal mines**

## The Mine Operator of an underground coal mine must ensure that plant powered by a non-explosion protected internal combustion engine is used:

### only in a NERZ at the mine; and

### only if:

#### the engine is a compression ignition type and clearly marked as a non-explosion protected engine (certified to AS/NZS3584.1:2008); and

#### a risk assessment is undertaken for the plant’s operation and any risk controls identified by the risk assessment are implemented; and

#### for plant that is mobile equipment, access by the plant into an ERZ1 is prevented by a system that is either fail safe or includes multiple redundancy devices.

## The Mine Operator must ensure an internal combustion engine used to power plant in an ERZ1 is:

### a compression ignition type;

### a type that has been tested by a nationality accredited testing station under AS/NZS 3584.2:2008 ‘Diesel engine systems for underground coal mines – Explosion protected and clearly marked with information identifying the test report; and

### assessed by the engine’s manufacturer as safe to use in an ERZ1 (having regard to **Schedule D**) and clearly marked with information identifying the assessment report.

## The Mine Operator of a coal mine must ensure an internal combustion engine is not used to power plant in an ERZ0.

# **Electrical Engineering Control Plan**

*Drafting Note: The intent of the requirements for an Electrical Engineering Control Plan is to provide for the control of risks associated with the use of electricity in a mining environment. There are some risks associated with electricity that are unique to the underground environment and others that are applicable to both the underground and surface mining environment. However, certain electricity risks are unique to the mining industry and general electricity regulations provided for in Work Health and Safety Regulations are not sufficient for all requirements in the mining context. The means of controlling risks associated with electricity in the mining industry have been developed over a number of years and the known risks and their associated controls are required to be documented in order to ensure that the risks are appropriately managed.*

**Live electrical work**

## Live electrical work must be prohibited in a mine (excluding live testing).

## Live testing at a mine must be prohibited:

### in high voltage electrical operations, except where the testing is undertaken as a part of the processes identified within paragraph [19.6(25)](#_access_procedures_for) for verifying isolation and safe access;

### on extra Low Voltage or Low Voltage circuits except where the testing is undertaken in accordance with AS/NZS 4836:2011 in areas identified as non-hazardous (such as a NERZ in an underground coal mine);

### additionally, for a coal operation:

#### in an ERZ0

#### in an ERZ1 unless it involves:

##### intrinsically safe circuits and test equipment which complies with explosion protection certification requirements for the circuit being tested and the persons undertaking the work are competent in maintaining in the electrical equipment for explosive atmospheres; or

##### intrinsically safe circuits being tested with test instruments where the environment in which the circuit is located has been tested and found to contain less than 10% LEL of the explosive gas and controls implemented to maintain the environment at that condition for the duration of the testing.

**Third party audit certification**

## A person conducting a business or undertaking at a coal mine that carries out the repair, overhaul or modification of explosion protected equipment must have their business recognised under the ANZ Ex “Recognised Service Facilities” program or certified under the IEC Ex “Certified Service Facility Scheme”, before carrying out such work on equipment for use in explosion risk zones at the coal mine.

## *Drafting Note: Such recognition or certification provides mine operators with a greater level of assurance of the expertise of those businesses that are engaged to conduct certain undertakings and activities safely and with the requisite expertise.*

## A mine operator is prohibited from using any person to carry out the repair, overhaul or modification of explosion protected equipment for use in an ERZ at the mine unless the work is undertaken by a service facility recognised under the ANZ Ex “Recognised Service Facilities” program or the IEC Ex Certified Service Facility Scheme, and only in accordance with the scope of the Certificate of Recognition or Certificate of Conformity.

**Portable Electrical Equipment**

## The mine operator must ensure that mains powered portable electrical equipment will be safe from electrical shock such that the equipment operates at not more than 250v and has an earth leakage of not more than 30mA sensitivity.

## The mine operator must ensure that the Electrical Engineering Control Plan for a coal mine provides for using certified and uncertified portable electrical equipment, other than portable gas detectors, in an ERZ1.

## The mine operator must ensure that the Electrical Engineering Control Plan for a coal mine must provide procedures for using certified and uncertified portable electrical equipment, other than portable gas detectors, in a NERZ.

## **Electrical Engineering Control Plan**

## A mine operator must develop an Electrical Engineering Control Plan for managing electrical health and safety risks arising in mining operations including the use of ERZ to isolate electrical plant from certain parts of the mine where they present a risk to health and safety, and to control risks, including but not limited to:

### prevent injury to persons from sources of electrical injury;

### prevent uncontrolled fires where electrical energy is the ignition source;

### prevent initiation of gas or coal dust explosions by electrical energy;

### prevent unintended operation of plant;

### provide electrical safeguards for electrical and non-electrical hazards, with a probability of failure appropriate to the degree of risk associated with the hazard;

### provide the means by which the safety of electrical plant and electrical engineering practices is or are managed, including requirements of the mine safety legislation and any relevant requirements of the Regulations made under the [*Work Health and Safety Act*].

## ,

## The mine operator must ensure that the Electrical Engineering Control Plan provides for:

### the installation, commissioning, maintenance and repair of electrical plant and installations being undertaken only by a qualified electrical engineer or qualified electrical tradesperson, or persons under the supervision of a qualified electrical engineer or qualified electrical tradesperson;

### the standards of engineering practice for electrically powered plant, electrically controlled plant, installations, electrical engineering practices used at the mining operations, and, in particular, all electrical installations located on the surface at a mining operation being required to comply with AS/NZS 3000 and AS 3007 Parts 1 to 5.

## **Additional obligations relating to Electrical Engineering Control Plans for Coal Mines**

## In addition to the above requirements, the Mine Operator of a coal mine must ensure that the Electrical Engineering Control Plan provides for:

### explosion protected electrical plant and cables that the mine operator, in consultation with the electrical engineering manager of the coal mining operations, has determined is suitable for its intended environment of use and complies with the following requirements:

#### for electrical plant used in an ERZ0:

##### a valid certificate of conformity, as having explosion protection category Ex ia, Ex s (for Zone 0), Ex ma or Ex I, and which accords with paragraph (d) of these drafting instructions below for which the applicable information listed in paragraph 23.10(1)(e) of these drafting instructions below is maintained as required by that drafting instruction requirement;

[*DRAFTING NOTE: the ERZ terminology defines different levels of explosion risk. Those have been set out in drafting instructions from 18.15 and in the definitions section above.*]

##### any type of plant certified as explosion protection level (**EPL**) ‘Ma’, as defined in AS/NZS 60079.14: 2009 ‘Electrical Atmospheres, Part 14: Electrical Installations Design, Selection and Erection’, and which accords with paragraph 23.10(1)(d) of these drafting instructions below for which the applicable information listed in paragraph (e) of these drafting instructions below is maintained as required by that drafting instruction requirement;

##### paragraph 23.10(1)(a)(ii) in these drafting instructions above does not apply to electrical cables that are part of an Ex ia, Ex s, Ex I or EPL Ma circuit.

#### for electrical plant used in an ERZ 1:

##### has a valid certificate of conformity, as having explosion protection, and which accords with paragraph 23.10(1)(d) of these drafting instructions below, for which the applicable information listed in paragraph 23.10(1)(e) of these drafting instructions below is maintained as required by that drafting instruction requirement;

##### cables conforming to the requirements of this mine safety legislation AS/NZS 1972 “Electrical cables – Underground coal mines – Other than reeling and trailing” and AS/NZS 1802 “Electric cables – Reeling and trailing – For underground coal mining”;

##### paragraph 23.10(1)(b)(i) in this drafting instructions above does not apply to:

###### electrical equipment associated with hot work being undertaken in accordance with the coal mines hot work management system;

###### to portable electrical apparatus in accordance with the Portable Electrical Apparatus Scheme set out under paragraphs 23.3, 23.6 and 23.7 of these drafting instructions below;

###### in relation to Queensland coal mines, to a power transformer;

###### cables conforming to the requirements of paragraph 23.3(1)(b)(ii); or

###### any electrical cable determined as suitable by the site senior executive (in consultation with the electrical engineering manager), that is used solely as part of an intrinsically safe circuit;

#### for electrical equipment installed or operated in an NERZ at the mine, either:

##### has a valid certificate of conformity, as being explosion protected, and which accords with paragraph 23.10(1)(d) of these drafting instructions below for which the applicable information listed in paragraph 23.10(1)(e) of these drafting instructions below is maintained as required by that drafting instruction requirement; or

##### has a degree of protection of, or equivalent to, at least IP55, as defined under AS60529:2004 ‘Degree of protection provided by enclosures (IP Code)’;

##### paragraph 23.10(1)(c)(i) and 23.10(1)(c)(ii) of these drafting instructions above does not apply to:

###### electrical cables;

###### electrical equipment associated with Hot Work being undertaken in accordance with the coal mine’s hot work management system;

###### Portable Electrical Equipment in accordance with the Portable Electrical Apparatus Scheme pursuant to paragraphs 23.5, 23.6 and 23.7 of these drafting instructions;

###### electrical equipment installed in a pressurised room;

#### valid certificate of conformity means a certificate of conformity:

##### for Group I (mines susceptible to fire damp) as defined in section 4 of AS/NZS60079.0:2005 ‘Electrical Apparatus for Explosive Gas Atmospheres, Part 0: General Requirements’, or, for plant that is intrinsically safe, Group II associated apparatus, as defined in AS/NZS60079.0:2005 ‘Electrical Apparatus for Explosive Gas Atmospheres: General Requirements’; and

##### an AUS Ex Certificate of Conformity, an ANZ Ex Certificate of Conformity, or, an IEC Ex Certificate of Conformity; or

##### for equipment installed prior to the date of this mine safety legislation, a valid MDA or QMD approval listed in the regulator’s published “Explosion Protected Electrical Apparatus Approvals List”, as amended from time to time;

##### in the case of restrained plugs and receptacles, must also attest to compliance with AS1299: 2009 “Electrical Equipment for mines and quarries – Explosion protected three-phase restrained plugs and receptacles for working voltages up to and including 3.3kV”;

#### the following information must be supplied by the manufacturer or supplier of the explosion protected plant:

##### where plant is certified, a copy of the certificate of conformity;

##### where plant only has a approval as listed in 23.10(1)(d)(iii) above, a copy of the approval;

##### where plant is certified and approved, a copy of the certificate of conformity and a copy of the approval;

##### information in accordance with section 30 of AS/NZS60079.0 (2008) ‘Electrical Apparatus for Explosive Gas Atmospheres, Part 0: General Requirements’;

##### for AUS Ex, ANZ Ex and IEC Ex certificates of conformity, plant drawings that:

###### identify all features of the plant that form part of the explosion protected properties;

###### give sufficient details so that the plant can be verified as complying to the drawing;

###### give sufficient details so that the plant can be verified as complying with the Certificate of Conformity;

###### are traceable to the drawings used in testing and assessment for certificate purposes; and

##### information supplied by the manufacturer or supplier of the explosion protected plant must be maintained at the coal mining operations.

### the maintenance of explosion protected plant and installations in an explosion protected state;

### ensuring that repair, overhaul or modification of Explosion protected electrical equipment is undertaken only by service facilities that have an ANZ Ex Certificate of Recognition or an IEC Ex Certificate of Conformity, and that the work undertaken is within the scope of that Certificate of Recognition or Certificate of Conformity;

### ensuring that the repair of flexible reeling, trailing and feeder cables for use in an ERZ is undertaken only by a repair facility that can demonstrate the following through third party assessment:

#### manufacture of quality accreditation of management systems;

#### cable testing and repair processes in accordance with AS/NZS 1747;

#### provision of equipment and facilities that enable testing and repair in accordance with AS/NZS 1747;

#### competency of personnel undertaking each stage of the testing and repair process; and

#### the provision of a statement by a competent person employed by the cable repair facility attesting to repairs having been undertaken and completed in accordance with the requirements of AS/NZS 1747 prior to dispatch of each repaired cable.

#### *Note. Certification as an ANZ Ex service facility for cable repairs or licensing by a regulator, where such schemes exist, may be deemed to provide evidence of compliance with the requirements of 23.10(4)(b)*.

### only a person who is competent in maintaining electrical equipment for explosive atmospheres may carry out the following work at a mine:

##### electrical work in an ERZ;

##### work on electrical equipment used in a ERZ;

##### work on extra low voltage systems associated with explosion protected equipment in installations;

##### work on explosion protected electrical equipment installed at a surface mine, or on the surface of an underground mine;

##### electrical work in an area, at a surface mine, or on the surface of an underground mine, that has been identified by a hazardous area assessment in accordance with AS/NZS 3000 as presenting an explosion risk;

### the rating and design of plant and installations (including cables) for:

##### the prospective electrical fault level;

##### arc fault control, including prevention of arcing faults compromising explosion protection properties;

### selecting, installing and using electrical cables and electrical cable accessories for use at the mine;

### the design, installation, operation and maintenance of electrical equipment and installations at the mine to provide for:

#### the safe and secure location of the mines electrical equipment and installations;

#### the design and operation of liquid filled electrical equipment;

#### minimising potential impacts from voltage rise due to lightning, static electricity, voltage surges and other transient voltages to within acceptable limits, including:

##### the prevention of the ignition of gas by a static electric charge, and

##### the prevention of the effects of lightning being transferred to the underground parts of the coal mine;

#### reliable circuit interruption, under fault conditions, at all points in the mines electrical distribution system;

#### each circuit protection device at the mine having an appropriate operating time and tripping current, having regard to a risk assessment of the operation of the part of the electrical installation that it protects;

#### each earthing system at the mine to be of sufficiently low impedance to ensure reliable operation of all electrical protection systems and devices and provide adequate protection against indirect contact;

#### limiting prospective touch, step and transfer voltage to within acceptable limits;

#### the construction of electrical protection devices to an appropriate standard;

#### each electrical control system at the mine operates safely under all operating conditions, including electricity supply instability or failure;

#### if a control system suffers a fault or fails, all emergency stopping systems and safety alarms associated with that control system remain effective;

#### the interruption of the supply of electricity to mobile or transportable electrical plant, fed by a flexible reeling or trailing cables, when the continuity of the connection to earth is compromised;

#### the prevention of the connection of electrical power to explosion protected mobile or transportable electrical apparatus in the event of an earth fault on a flexible cable supplying the apparatus;

#### the limitation of earth fault currents to mobile or portable plant fed by a flexible reeling or trailing cables, and to electrical plant in the underground parts of the coal mining operations;

#### electrical equipment exceeding extra low voltage used at the mine having a device or feature for preventing a person inadvertently contacting live parts of the equipment. Examples of such devices or features include an enclosure, shield, insulation, interlocking device, or automatic disconnection device;

### the control of electrical energy in parts of the coal mining operations, including the provision of suitable switch gear to safely switch electrical power in the mine, including:

#### at each place where persons enter underground from the surface, either:

##### a suitable communication method for advising a person to switch off the electricity supply to underground electrical equipment and cables; or

##### a way to switch off the electricity supply;

#### a full current isolator for equipment driven by electricity at the mine;

#### the equipment clearly identified as being supplied with electricity from the isolator;

#### the isolator being:

##### clearly identified as the isolator for the equipment; and

##### easily accessible to a person required to work on the equipment;

*Note: The above requirement does not preclude the use of properly designed and rated remote isolation systems for equipment, as defined in AS1755:2000 ‘Conveyers – Safety Requirements’.*

### the interruption of the supply of electricity in the event of the following circumstances:

#### in the presence of flammable gas levels at or above:

##### NERZ - 0.5%

##### ERZ1 - 2%;

#### if ventilation falls below a specific quantity (to be determined by the mine operator in consultation with the underground mine manager and the electrical engineering manager);

### the removal of power from electrical plant or equipment in the event of:

#### a failure to maintain plant in accordance with the electrical engineering management plan; or

#### unsafe electrical plant or practises being detected;

#### if inspections required by the inspection program, determine it is necessary;

### the safe restoration of the supply of electricity by a competent person;

### the safe operation of high voltage installations throughout their life cycle;

### the prevention of live electrical work on electrical plant and installations at the mine;

### the prevention of live testing on electrical plant and installations at the mine, except in accordance with paragraph 23.2;

### the safety from hazards within the responsibility of the mine operator of the coal mining operations of persons undertaking installation, maintenance or emergency work on an electricity supply authority’s infrastructure;

### the reasonable access of persons undertaking installation, maintenance or emergency work on an electricity supply authority’s infrastructure to that infrastructure;

### a commissioning, testing and notification process prior to use of the circuit, to be undertaken by competent persons, as defined in AS/NZS 3000:2007 “Wiring rules”;

### commissioning and test reports to be kept by the mine operator throughout the life cycle of the plant;

### specific procedures for the following:

#### use of electric welding plant;

#### use of electrical test instruments;

#### work near overhead power lines and cables;

#### treatment of electric shocks and electric burns;

### the placing of appropriate signage and notices at electrical switch gear and other prominent positions, being signage and notices that do the following:

#### warn of the presence of electricity;

#### provides advice on what to do in the event of:

##### a fire on or in electrical plant;

##### provide advice on what to do in the event of an electric shock and other electrical injuries;

#### provide advice on the isolation point for the electrical plant;

### drawings and plans of the mine’s electrical installations, maintained and kept up to date, easily accessible by each worker at the coal mine, required to access the drawings or plans, and including:

#### the location of each main electricity reticulation line;

#### the location of all high voltage cables and switch gear on a mine plan;

#### the location, rating, identifying label and purpose of each main isolator, substation and high voltage switch board;

#### any information required to perform switching programs;

#### for a surface mine, the general location of each item of high voltage mobile plant supplied with electricity by a trailing cable;

#### for an underground mine, the location of each fixed communication device at the mine;

#### the location of all buried services on the surface of the mine;

### plant and procedures to ensure that, in the event of a failure of the main ventilation system, the electric power supply entering the coal mining operations (other than power to intrinsically save plant):

#### is automatically cut off, as soon as reasonably practicable; and

#### is incapable of being restored before the main ventilation system is repaired and restarted; and

#### is not restored until it is safe to do so;

### access procedures for working on high voltage installations that include the isolation of electrical installation, testing for the presence of electricity, the application of locks to switch gear to prevent inadvertent energisation of an isolated circuit and the application of working earths;

### the security and maintenance of the mine’s electrical control system software and control circuits, including the following:

#### controlling modification of the software and circuits; and

#### keeping records of any modifications;

### the safe use of lasers, including fibre optic equipment at the mine;

### constructing, installing, operating and maintaining the battery powered vehicles used at the mine and battery charging stations.

## The Mine Operator must ensure that the Electrical Engineering Control Plan for a coal mine provides for using certified and uncertified portable electrical equipment, other than portable gas detectors, in an ERZ1.

## The Mine Operator must ensure that the Electrical Engineering Control Plan for a coal mine must provide procedures for using certified and uncertified portable electrical equipment, other than portable gas detectors, in a NERZ.

## The mine operator must ensure that mains supplied portable electrical equipment will be safe from electrical shock such that the equipment operates at not more than 250v and has an earth leakage of not more than 30mA sensitivity.

## **Additional obligations relating to Electrical Engineering Control Plans for Metalliferous Mines**

## The Mine Operator must ensure that electrical engineering control plan for a metalliferous mine provides for:

### restrictions on carrying out work on electrical equipment that has explosion protection, unless the person has the competencies to carry out that work;

### the rating and design of plant and installations (including cables) for:

#### the prospective electrical fault level;

#### arc fault control;

### selecting, installing and using electrical cables and electrical cable accessories at the mine;

### the design, installation, operation and maintenance of electrical equipment and installations at the mine including:

#### the safe and secure location of the mine’s electrical equipment and installations;

#### the design and operation of liquid filled electrical equipment;

#### minimising potential impacts from voltage rise due to lightning, static electricity, voltage surges and other transient voltages to within acceptable limits, including:

##### the prevention of the ignition of gas by a static electric charge; and

##### prevention of the effects of lightning being transferred to the underground parts of the mine;

#### reliable circuit interruption, under fault conditions, at all points in the mine’s electrical distribution system;

### each circuit protection device at the mine having an appropriate operating time and tripping current, having regard to a risk assessment of the operation of the part of the electrical installation it protects;

### each earthing system at the mine to be of sufficiently low impedance to ensure reliable operation of all electrical protection systems and devices and provide adequate protection against indirect contact;

### limiting prospective touch, step and transfer voltage to within acceptable limits;

### the construction of electrical protection devices to an appropriate standard;

### each electrical control system at the mine operates safely under all operating conditions, including electricity supply instability or failure;

### if a control system suffers a fault or fails, all emergency stopping systems and safety alarms associated with that control system remain effective;

### the interruption of the supply of electricity to mobile or transportable electrical plant, fed by a flexible reeling or trailing cables, when the continuity of the connection to earth is compromised;

### the prevention of the connection of electrical power to mobile or transportable electrical apparatus in the event of an earth fault on a flexible cable supplying the apparatus;

### the limitation of earth fault currents to mobile or transportable plant fed via flexible reeling or trailing cables, and to electrical plant in the underground parts of the mine;

### electrical equipment exceeding extra low voltage used at the mine have a device or feature for preventing a person inadvertently contacting live parts of the equipment *[Example of device or feature— an enclosure, shield, insulation, interlocking device or automatic disconnection device]*;

### the control of electrical energy in parts of the mine, including the provision of suitable switch gear to safely switch electric power in the mine, including

#### at each place where persons enter underground from the surface, either:

##### a suitable communication method for advising a person to switch off the electricity supply to underground electrical equipment and cables; or

##### a way to switch off the electricity supply;

### a full current isolator for equipment driven by electricity at the mine including ensuring that:

#### the equipment clearly identified as being supplied with electricity from the isolator,

#### the isolator being:

##### clearly identified as the isolator for the equipment; and

##### easily accessible to a person required to work on the equipment;

### *Note - This does not preclude the use of properly designed and rated remote isolation systems for equipment, as defined in AS1755:2000 ‘Conveyors – Safety Requirements’*

### the removal of power from electrical plant or equipment in the event of:

#### a failure to maintain plant in accordance with the electrical engineering management plan; or

#### unsafe electrical plant or practices being detected;

### the safe restoration of the supply of electricity by a competent person;

### the safe operation of high voltage installations throughout their life cycle;

### the prevention of live electrical work on electrical plant and installations at the mine;

### the prevention of live testing on electrical plant and installations at the mine, except in accordance with paragraph 23.2;

### the reasonable access of people undertaking installation, maintenance or emergency work on an electricity supply authority’s infrastructure to that infrastructure;

### a commissioning, testing and notification process prior to use of the circuit, to be undertaken by competent persons, as defined in AS/NZS 3000:2007 ‘Wiring rules’;

### commissioning and test reports must be kept by the operator throughout the lifecycle of the plant;

### specific procedures for the following:

#### use of electric welding plant,

#### use of electrical test instruments,

#### work near overhead power lines and cables,

#### treatment of electric shocks and electric burns;

### the placing of appropriate signage and notices at electrical switchgear and other prominent positions, being signage and notices that do the following:

#### warn of the presence of electricity,

#### provide advice on:

##### what to do in the event of:

###### a fire on or in electrical plant,

###### an electric shock and other electrical injuries,

##### the isolation point for the electrical plant;

### drawings and plans of the mine’s electrical installations, maintained up-to-date, easily accessible by each mine worker required to access the drawings or plans, and including:

#### the location of each main electricity reticulation line;

#### the location of all high voltage cables and switchgear on a mine plan;

#### the location, rating, identifying label and purpose of each main isolator, substation and high voltage switchboard;

#### any information required to perform switching programs;

#### for a surface mine, the general location of each item of high voltage mobile plant supplied with electricity by a trailing cable;

#### for an underground mine, the location of each fixed communication device at the mine;

#### the location of all buried services on the surface of the mine;

### access procedures for working on high voltage installations that include the isolation of electrical installation, testing for the presence of electricity, the application of locks to switch gear to prevent inadvertent energisation of an isolated circuit and the application of working earths;

### the security and maintenance of the mine’s electrical control system software and control circuits; including:

#### controlling modification of the software and circuits; and

#### keeping records of any modifications;

### the safe use of lasers, including fibre optic equipment at the mine;

### constructing, installing, operating and maintaining the battery powered vehicles and battery charging stations used at the mine.

# **Ventilation Control Plan**

## The mine operator must develop and implement a ventilation control plan.

## Ventilation arrangements for an underground mine must provide for the following:

### the design, monitoring and control of the underground ventilation arrangements to ensure the atmosphere in each part of the mine has a general body concentration that is within the prescribed limits (including design, monitoring and control required to support gas management, spontaneous combustion management or other hazard management arrangements at the mine that are dependent on ventilation);

### the supply to all accessible parts of the mine of sufficient ventilation including:

#### ensure that a procedure for ventilating the parts of the underground coal mine where workers conduct work is developed and implemented which includes the maximum distances from the mine face for locating ventilation ducting and brattice lines;

#### arrange for the installation of ventilation control devices and the designation by signage of the particular ventilation control device at the mine, as a device that must not be interfered with, and ensuring each person at the mine is notified of the designation;

#### the maintenance of return airways in a condition so that they are accessible to those who must inspect them or travel through them in an emergency;

#### the control of ventilation;

#### reporting procedures relating to ventilation;

#### the maintenance of ventilation records and plans;

#### the manner of sealing of parts of the mine and the precautions to be taken in sealing parts of the mine;

#### audits of the operation of the arrangements and for periodic reviews (at intervals not exceeding 2 years) of the effectiveness of the ventilation arrangements;

#### the work health and safety management system at the mine and its ventilation control plan must provide for audit/certification of ventilation plans;

#### the manner of sealing of parts of the mine and the precautions to be taken in sealing parts of the mine;

#### the ventilation control plan at the mine must include those areas of the mine that are unventilated and or disused and or sealed areas at the mine. Such a provision ensures that the ventilation control plan at the mine is required to consider how persons are to be prevented from inadvertently entering areas that are inadequately ventilated;

#### any matters required to put into effect the provisions for ventilation control plans;

#### an underground mine must have a procedure for constructing, installing using and maintaining the mines’ ventilation control devices;

#### ensuring fans used for ventilating the mine where methane may be present are connected to methane detectors and that an automatic visible alarm is triggered when the general body concentration of methane is exceeded.

## The Mine Operator of an underground mine must ensure that a part of the mine is not worked unless ventilation is sufficient to meet the requirements of the mine’s ventilation arrangements for that part of the mine. There must be a requirement in the mine safety legislation for the mine operator to be satisfied that all areas of a mine are adequately ventilated before any person may enter the relevant work area unless an emergency situation or for rectifying the problem with the ventilation.

## Where ventilation is found to be inadequate, the mine operator of a mine must ensure that the person with responsibility for the affected area undertakes the following:

### immediately takes such measures as are available to the person to restore adequate ventilation to the affected area; and

### notifies the ventilation officer of the interruption of the ventilation; and

### ensures that no person gains access to that affected area before adequate ventilation has been restored; and

### provides a written report to the mine operator of the measures which have been taken to restore adequate ventilation.

## The volume of air passing through each continuous working place in which a mine worker conducts work must not be less than 0.3 cubic metres per second for each square metre of normal development cross-sectional area.

## For the purposes of the drafting instruction above, the mine safety legislation is to provide that the normal development cross-sectional area is to be determined by measuring from side to side, ignoring the presence of ventilation devices and not measuring at any partially or fully completed intersection of two roadways. The mine safety legislation must provide that the volume of air passing through each longwall working place must not be less than 4 cubic metres per second for each metre of extracted height.

## Ensure not more than two temporary stoppings are installed in a line of ventilation stoppings separating an intake airway from a return airway immediately adjacent to the last line of cut- throughs in the panel.

## **Main fans**

## As fans and associated plant are critical to the mine ventilation system, they must, so far as is reasonably practicable, be designed and installed to ensure that they carry out their functions safely.

### ensure that every ventilation fan installed at the surface part of the mine forthe purpose of ventilating the mine is placed in such a position and under such conditions as to ensure that it will not be damaged by an explosion in the mine; and

### ensure that an effective airlock is provided and maintained at each shaft or outlet connected to the main ventilation fan or fans on the surface part of the mine and used for winding or the transport of people or materials; and

### ensure that there is provided and maintained at the surface part of the mine in connection with every main ventilation fan a continuously indicating pressure gauge and a device for continuously indicating and recording the volume of air passing through the fan; and

### ensure each type of fan including the main fan has a procedure for starting; and

### each fan installed on the surface, and each booster fan installed below ground, at the mine as part of its ventilation system, is fitted with the following:

#### an equipment condition monitoring device;

#### a device capable of continuously monitoring and recording the fan’s static pressure operates in a way that, if it detects a significant departure from the fan’s normal operating parameters, it:

##### first, triggers a visible alarm; and

##### second, trips the electricity supply to the fan; and

##### records the date and time of the action mentioned in paragraphs (i) and (ii); and

#### must ensure the part of the device displaying the results of the monitoring is located where it is easily accessible by a person whose task includes checking the condition of the fan.

#### **Auxiliary fans**

## The mine operator must:

### ensure that an auxiliary ventilation fan used in the underground parts of the mine is located and operated in such a manner as to prevent recirculation of air through the fan;

### where two or more fans are in a panel, the minimum quantity of air flowing in any panel at the mine should be:

#### 30% in excess of the open circuit capacity of the auxiliary fan; and

#### the minimum quantity of air flowing at the mine in any panel where two or more auxiliary fans are operating must be 30% in excess of the open circuit capacity of the largest fan in the panel;

### ensure an auxiliary fan, other than a compressed air powered auxiliary fan, used at the mine is capable of switching off automatically if the main ventilation system fails totally.

### ensure the mine has a procedure for using the following fans if the fans are used in the mine’s ventilation system:

#### auxiliary fans, including auxiliary fans used for degassing places where methane has accumulated;

#### booster fans; and

#### scrubber fans;

### have regard to ways of ensuring a compressed air powered auxiliary fan is de-energised promptly if the main ventilation system fails.

### ensure a scrubber fan used at an underground mine is located and operated in a way that prevents the uncontrolled recirculation of air through the fan.

### **Dealing with fans**

## The mine operator must ensure, so far as reasonably practicable, that a person does not deal with a fan ventilating a place below ground at an underground mine unless that person is authorised to do so.

## The mine operator must ensure, so far as reasonably practicable, that before a person starts or stops a fan ventilating a place below ground at an underground mine, the person ensures that each person likely to be affected is notified.

## *[Note: to ‘deal with’ a fan in 20.10 and 20.11 above means start, stop, remove or alter the fan.]*

**Ventilation failures**

## The mine operator of an underground mine must be required to prepare procedures to be followed in the event of failure of the main ventilation system of the mine for the purpose of ensuring health and safety and, where considered necessary, the safe withdrawal of people from the underground parts of the mine.

## The mine operator must develop and implement procedures for the action to be taken to ensure the safety of persons if the system for ventilation at the mine fails either totally or in part for more than 30 consecutive minutes and ensure that the system installed and maintained to monitor the operation of the main ventilation fan or fans of the mine provides for the giving of an alarm at the surface part of the mine if the fan or fans stop.

## The mine operator for a coal mine must ensure that, in the event of a failure of the main ventilation system for part of the coal mine, every battery operated portable or mobile machine located in that part of the coal mine is brought out without any delay to:

### the main intake airways; or

### a charging or repair station of suitable fire proof construction that is normally ventilated with intake air.

## For the purposes of these drafting instructions relating to ventilation failures, if an underground mine is ventilated by more than one main ventilation fan, a failure of one or more of the fans is to be considered a failure of the main ventilation system.

## If a ventilation system fails in a coal mine, the mine operator must undertake certain actions including cutting off electrical power in the coal mine as soon as reasonably practicable in order to safeguard against any rising levels of gas and must also restore the system as soon as possible.

## In relation to underground coal mines, the mine operator must take such steps as are necessary to ensure that the ventilation at the commencement of an ERZ in each production area of mining operations is normally kept free from methane. The mines safety legislation should provide that the commencement of an ERZ is not considered to be normally free from methane if the average percentage by volume of methane in the general body of air in the airway (from at least two determinations over at least two days) exceeds 0.25%. In the event of any inconsistency in determination, a determination by an inspector as to the percentage by volume of methane is to prevail over the determination that has been made by another person.

## The mine safety legislation must prescribed certain actions to be undertaken when airborne contamination monitoring identifies the presence of flammable or noxious gases or other hazardous conditions.

*Drafting Note: This requirement is intended to ensure that minimum actions are taken by workers, specified persons and supervisors when certain defined hazardous conditions exist in order to prevent risks to health and safety from emerging. In that regard, the mine safety legislation should provide for procedures where inherently risky conditions exist by reason of the presence of the flammable or*

*noxious gases.*

## Those procedures put in place by the mine operator must include the following:

### in an underground mine, a person who finds or suspects that an accessible place at the mine constitutes a risk by reason of the presence of flammable or noxious gases must notify a supervisor at the mine of the risk;

### a mining supervisor at the mine who has been notified of such a place of risk must as soon as reasonably practicable, and as far as safely possible, inspect the place;

### a worker at the mine who finds that a place at the mine constitutes a risk by reason of the presence of flammable or noxious gases must:

#### immediately inform their supervisor;

#### a deputy or underground supervisor who becomes aware must immediately remove other persons from the place and isolate or fence off the place; and

#### take such steps as are available to the supervisor at the mine to eliminate the risk and then, as soon as practicable, report the risk, and the steps taken to eliminate it, to the mine operator;

### if the risk has not been eliminated, the mine operator must, so far as is reasonably practicable, control the risk;

### a supervisor at the mine must ensure that a record of any report made above is made before the end of the relevant shift on which the risk has been identified; and such records required under this drafting instruction are to be kept at the mine for a period of at least five years.

## For the purpose of this drafting instruction immediately above, a place is taken to constitute a risk:

### by reason of the presence of flammable gases if the percentage of flammable gases in the general body of air in that place is found to be 2% or more; or

### if it within a hazardous zone, electrical apparatus is in use and the percentage of flammable gases in the air is 1.25% or more).

### [***Jurisdictional Note****: NSW to refer to the transitional provision for transition to ERZ.*]

**Goaf Management**

## Where an underground mine contains a goaf, the Mine Operator at that underground mine must ensure that appropriate steps are taken for the purpose of controlling risks posed by emissions of flammable and noxious gases from the goaf, including to:

### prevent intake air from travelling across the face of a permanent seal at the mine; and (*NOTE: this should be from a specified time in the future to provide all mines the opportunity to comply. It will not apply existing mines nor roadways*)

### eliminate or minimise the risks of inrush and leakage, into intake airways, of atmospheric contaminants from goaf areas and abandoned or sealed workings; and

#### ensure leakage through the seal is minimised and damage to the seal is prevented;

#### the seal is, as a minimum, a type C seal;

#### a monitoring device is installed in each intake airway on the return side of the seals over which the intake air passes to detect the intake airway’s general body concentration of:

##### oxygen; and

##### carbon dioxide, if it is present behind the seal in a general body concentration greater than 3%; and

##### any other gas that is present behind the seal in a quantity and concentration that is likely to create a risk if it enters the intake airway adjacent to the seal;

#### for longwall workings—the monitoring device mentioned in paragraph (c) is positioned at the intersection of the longwall face and the intake airway;

#### the monitoring system for paragraph (c) triggers an alarm to warn each person who may be affected if a gas mentioned in the paragraph is present in a predetermined concentration.

## An underground mine must have a procedure for evacuating persons to safe locations if an alarm mentioned above is activated.

**Heat Stress**

## Mine operators must ensure so far as is reasonably practicable that the health and safety risks associated with extreme temperatures are eliminated and where not reasonably practicable to eliminate, are minimised.

## The ventilation control plan applying to underground mines must also contain requirements for the monitoring and controlling of heat stress conditions for the mine to be addressed when managing ventilation in accordance with Schedule G.

**Routine and emergency sealing**

## The mine operator at a underground coal mine must ensure that a seal installed, other than at the surface, at the mine is, of a following type, as a minimum:

### if the level of naturally occurring flammable gas at the mine is insufficient to reach the lower explosive limit for the gas under any circumstances – type B;

### if persons remain underground when an explosive atmosphere exists and there is a possibility of spontaneous combustion or incendive spark or other ignition source – type D; [***Jurisdictional Note:*** *NSW not to adopt.]*

### for an underground mine, or part of an underground mine, which is not mentioned in the subparagraphs of this drafting instruction immediately above – type C.

## The underground mine manager must, so far as is reasonably practicable, ensure that a type E seal is used for sealing the entrance to the mine.

*Drafting Note: The ventilation control devices and design criteria table provided below outlines the design criteria relevant to each type of seal discussed in the above drafting instruction.*

**Ventilation control devices and design criteria**

| **Column 1 Ventilation control device** | **Column 2 Design criteria** |
| --- | --- |
| Brattice line or temporary stopping | Antistatic and fire resistant |
| Mine entry airlock | Capable of withstanding an overpressure of 70kPa whilst it is open |
| Separation stopping for a primary escapeway | Antistatic, fire resistant and of substantial construction providing for minimal leakage |
| Stopping, overcast or regulator installed as part of the main ventilation system | Capable of withstanding an overpressure of 35kPa |
| Stopping, overcast or regulator installed as part of the ventilation system for a panel | Capable of withstanding an overpressure of 14kPa |
| Type B seal | Capable of withstanding an overpressure of 35kPa |
| Type C seal | Capable of withstanding an overpressure of 140kPa |
| Type D seal | Capable of withstanding an overpressure of 345kPa |
| Type E seal | Capable of withstanding an overpressure of 70kPa |
| Ventilation ducting | Antistatic and fire resistant |

*Drafting Note: The mine safety legislation must also provide for notices of intention to seal a mine to be provided to the regulator. We note that these requirements are dealt with under the high risk notification activities provided in the non-core drafting instruction for notification of high risk activities.*

## In the event sealing becomes impracticable in an underground mine, or part of it, in the way in which the notice provided to the regulator under the high risk activities notification table provides, the mine operator must:

### take reasonable steps to notify the regulator of the changes from the initial proposed method of sealing the underground mine;

### if the notification provided by the mine operator to the persons identified in the subparagraph of this drafting instruction immediately above, that the notification be confirmed in writing as soon as reasonably practicable.

## There is a need for different requirements to be placed on Mine Operators in the context of emergency sealing. In that regard, when an underground mine, or part of an underground mine, requires sealing in emergency conditions, the mine operator must:

### ensure the sealing is carried out in a way that manages risk and a risk assessment is conducted in relation to the emergency sealing; and

### as soon as reasonably practicable after the sealing, provide an inspector written notification regarding the sealing.

## **Sealing of Mine**

## The mine operator must ensure that a type E seal is used for sealing the entrance of a mine

## The Mine Operator of an underground coal mine must ensure that:

### each entrance from the surface to the underground coal mine is capable of being sealed at the following locations:

#### the surface without requiring persons to travel in front of the entrance to seal it; or

#### in the event that the entrance is a vertical shaft:

##### in the way mentioned in the subparagraph (a) above immediately above; or

##### in a roadway at the bottom of the shaft.

### at least one of the entrances has a mine entry airlock capable of withstanding a pressure pulse of 70 kPa passing through the entrance while the airlock is open;

### when sealed, the mine has facilities allowing the following:

#### the use of inertisation equipment from a safe position;

#### monitoring the atmosphere behind the seal from the safe position;

#### persons to re‑enter the mine through the entrance; and

#### large mobile equipment to enter or exit the mine through an airlock.

## The Mine Operator at an underground coal mine must ensure the operation of each airlock installed for an entrance at the mine is tested, other than pressure tested, on a regular basis and at least once a year.

## The Mine Operator at an underground coal mine must ensure that the following facilities at the mine are tested at appropriate intervals to ensure that the facilities are capable of being used in the event of an emergency:

### the connection point for using inertisation equipment; and

### each airlock and seal required to be used with the inertisation equipment.

## The mine operator must ensure the mine, or part of it, is not sealed unless:

### the mine operator has given notice of the proposed sealing under section to the inspector;

### the mine operator must ensure the mine, or part, is sealed in the way acknowledged by the inspector;

### this section does not apply to sealing the mine in an emergency.

## A person must not, without an inspector’s written consent, enter or remain in an underground mine after the mine, or part of it, has been sealed.

## The mine operator of an underground coal mine must ensure that necessary facilities including, for example, water and cleared areas, are available for use with inertisation equipment.

## Modelling to ensure that the inertisation locations are located effectively should be undertaken at least once in every year.

**Diesel Emissions**

## The mine’s safety and health management system must provide for controlling the exposure of persons to an atmosphere at the mine containing internal combustion engine pollutants

## The Mine Operator must ensure sufficient ventilation is provided to dilute harmful exhaust pollutants for each type of compression ignition engine. This is to be a requirement of the ventilation control plan. In order to ensure that sufficient ventilation is provided, the mine operator must verify by testing, the gaseous and particulate characteristics of each compression ignition engine at the mine. This is to be done on a regular basis, and at least monthly.

## The air at a working place in the mine must, so far as is reasonably practicable, be provided at an adequate velocity to prevent workers from being exposed to a concentration of dust in excess of the limit as schedule or otherwise prescribed and to prevent over-exposure to pollutants contained in the exhaust from diesel engines.

## The volume of air passing through each continuous working place in which a mine worker conducts work must not be less than 0.3 cubic metres per second for each square metre of normal development cross-sectional area.

## For the purposes of the drafting instruction above, the mine safety legislation is to provide that the normal development cross-sectional area is to be determined by measuring from side to side, ignoring the presence of ventilation devices and not measuring at any partially or fully completed intersection of 2 roadways.

## The mine safety legislation must provide that the volume of air passing through each longwall working place must not be less than 4 cubic metres per second for each metre of extracted height.

## The volume of air in each place where a diesel engine operates must be such that a ventilating current of not less than:

### 0.06 cubic metres per second for each kilowatt of maximum output capability of the engine; or

### 3.5 cubic metres per second,

## whichever is the greater, is directed along the airway in which the engine operates.

## If more than one diesel engine is being operated in the same ventilating current, the mine safety legislation must prescribe that the engine kilowatts must be added and the minimum ventilation requirement is 0.06 cubic metres per second per kilowatt or 3.5 cubic metres per second, whichever is the greater.

# **Explosives Control Plan**

## **Provisions applying to Explosives Control Plan for all mines**

## [***Jurisdictional note****: authorisations vary from state to state e.g. in Queensland they must be authorised by the chief inspector for the Explosives Act 1999 as suitable for use in an underground mine]*

## *Selecting and Using explosives*

## The mine operator must ensure explosives used at the mine are authorised for use.

## *Drafting Note: Definition of “explosives” is in the definition section.*

## The mine operator must ensure that explosives for use, or used, at a surface mine must be stored, used and disposed of under *AS 2187* ‘Explosives—Storage, transport and use’.

## The mine operator must ensure at a mine in relation to selecting explosives for use at the mine are:

### stable; and

### fit for their intended use; and

### as insensitive as reasonably practicable to shock, sparks, friction and the environment in which they will be stored, transported and used; and

### as far as reasonably practicable, simple to store, use, transport and control.

*Principal Control Plan*

## The Explosives Control Plan must take in to consideration the following:

### transporting explosives at the mine;

### explosive precursors;

### inspecting and reporting on the safety of equipment used at the mine for manufacturing, storing, transporting and delivering explosives;

### taking appropriate action to make equipment mentioned in paragraph (3) safe;

### accounting for explosives brought onto the mine;

### checking for, and isolating, explosives that have deteriorated;

### minimising the risk of theft or misuse of explosives;

### identifying and controlling hazards:

#### during the charging and firing of explosives; and

#### in particular places, including, for example in a storage bin feeder in which an explosive is to be used to clear a blockage;

### finding, recovering and detonating misfired explosives;

### keeping a record about misfired explosives.

## The following specific controls are to be adopted by the mine operator and documented in the Explosives Control Plan for explosives to ensure the risks associated with explosives are eliminated or minimised so far as reasonably practicable:

### in the case of the surface parts of a mine, a requirement that a person who designs or initiates a shot must ensure that fly rock does not present a risk to people (whether at the mine or not);

### the use of explosives only by people who are licensed under the relevant explosives legislation to use explosives at the mine;

### the keeping of a register identifying those people currently at, or providing a service to, the mine who are licensed under the relevant explosives legislation to handle explosives at the mine;

### co-operation between the mine operator and any person authorised under the relevant explosives legislation regarding safety of the storage, handling, transportation and use of explosives, including compliance with any conditions attached to the authorisation under the relevant explosives legislation of the person handling the explosive.

*Issuing, and dealing with, explosives*

## A person must not use, handle or issue explosives at a mine unless the person is authorised and competent to do so.

# **Health Control Plan**

*[Drafting note: The evidence is compelling: for most individuals, working improves general health and wellbeing and reduces psychological distress. Even health problems that are frequently attributed to work—for example, musculoskeletal and mental health conditions—have been shown to benefit from activity-based rehabilitation and an early return to suitable work[[6]](#footnote-6). However in order for a worker to derive these benefits, work and workplaces must be safe[[7]](#footnote-7)*

*Ensuring the health of the worker in the workplace is not only a duty but the first defence against harm occurring to workers generally, ie sick, tired and fatigued worker may be more prone to making an error of judgement or mistake.*

*Worker health also includes issues relating to the fitness of workers arising from “life style” issues, such as smoking leading to lung disease or diet leading to heart disease. Healthy workers have greater work rates and are more resistant and resilient to the risks and eventuating harms that occur in and out of the mining workplace.*

*Consequently, risk management plans that target the good health of workers contribute to the production of sustainable mining workforces, operations and communities and thus economic growth overall.*

*A Worker Health Control Plan assists mine operator’s to confirm that health related control measures are working effectively. It includes measures that form part of the mine operator’s health surveillance system, fitness for work program, monitoring and prevention programs, radiation control, work environment management programs and other associated health related programs.]*

## A Mine Operator must develop and implement a Health Control Plan for safeguarding an promoting the health of workers at the Mine.

## Without limiting the generality of the above, the Health Control Plan must include the strategy and specific procedures to prevent workers suffering harm to their health as a result of exposure to general health hazards arising at the workplace.

## The Mine Operator must ensure that the development and implementation of the Health Control Plan includes:

#### consultation with persons whose health may be affected by the mining operations;

#### risk identification, assessment, control and evaluation (risk management) of the health hazards covered by the plan by persons trained in the identification of health hazards in mining operations;

#### indentifying the roles and responsibilities of persons in developing and implementing the plan;

#### performance monitoring and evaluation of the risk management process;

#### regular review and resultant modification of the plan; and

#### the provision of information, training and supervision to workers and in relation to the health hazards occurring and arising from the mining workplace.

## The Worker Health Control Plan must include, as a minimum, the means by which the following hazards and their health impacts, if arising in the mining operation, are to be controlled so as to ensure the health of the worker and others affected by the mining operations:

#### noise causing noise induced hearing loss;

#### vibration causing musculoskeletal conditions;

#### diesel exhaust fumes causing bronchitis/emphysema and lung cancer;

#### ergonomic stressors causing musculoskeletal conditions;

#### ergonomic stressors causing back conditions;

#### ergonomic stressors (shift work) causing fatigue and related conditions;

#### psychosocial hazards causing psychological conditions;

#### psychosocial hazards causing alcohol and drug-related conditions

#### ultra violet radiation causing skin cancer and cataracts;

#### asbestos dust causing asbestosis, lung cancer and mesothelioma;

#### silica dust causing silicosis, lung cancer, bronchitis and emphysema;

#### coal dust causing coal worker’s pneumoconiosis, bronchitis and emphysema;

#### hazardous substance exposure causing dermatitis;

#### hazardous substance exposure, including airborne dust, causing asthma and other harm;

#### welding fumes causing bronchitis, emphysema, fibroid lung disease and lung cancer;

#### extreme temperatures causing dehydration, hypa/hypo-thermia and other thermal stresses;

#### biological hazards causing infections;

#### ionising radiation causing malignancies; and

#### fatigue causing further risks to health and safety at the mining workplace and the public e.g. negligent driving occasioning death after driving home from work.

## The Worker Health Control Plan must provide for the:

#### specific controls for eliminating and minimising **exposure** of workers to the health hazards occurring in or arising out of the mining workplace;

#### specific controls for eliminating and minimising the health **impacts** to workers from exposure to the hazards occurring in or arising out of the mining workplace – eg. if workers are fatigued or psychosomatic from over work the mine operator is to identify the causes and put in place an appropriate response(s);

#### the formal monitoring of the **existence** of the health hazards occurring in or arising out of the mining workplace;

#### the formal monitoring of the **exposure** of workers to health hazards occurring in or arising out of the mining workplace;

#### the provision of **information and training** to workers in relation to all aspects of workers’ activities that may affect their health;

#### supervision of workers and training of supervisors;

#### **health surveillance** of workers, including the health surveillance system and any necessary biological monitoring;

#### **collection and consideration of control data;**

#### **illness management** and rehabilitation of workers;

#### worker **assistance** programs providing, education and counselling in relation to health, fitness, wellbeing, nutrition and relationship stress;

#### the keeping of first aid records and records management more generally;

#### reporting; and

#### evaluation and performance monitoring

**Health surveillance systems**

* 1. The duty to establish a system for health surveillance must encompass a documented system for the ongoing surveillance of the health of workers who are or are likely to be exposed to occupational health risks in the course of mining operations. This system must provide for periodic monitoring of the level of risk likely to adversely affect a person’s health arising from hazards at the mine.
  2. The health surveillance system must provide for the conduct of medical examination of workers by a registered medical practitioner before they commence their first shift working at the mine, immediately before they cease working at the mine, and periodically throughout their involvement in mining operations, to establish their level of health at each point in time.
  3. The health surveillance system must also include provision for periodic monitoring of the level of risk arising from hazards at the mine.
  4. The Mine Safety Regulations must require that the health surveillance system provide for measures by which the mine operator must ensure that a worker’s exposure to a hazard at the mine does not exceed national exposure standards and is as low as is reasonably practicable.
  5. Further, workers who have experienced adverse effects from exposure to a hazard at a mine must be removed from the hazard and not resume work until the hazard is effectively controlled.
  6. Records of health surveillance are to be created by the person who conducts the surveillance and include an explanation of the results, any indication of detrimental health effects and any recommendations as to measures required as a consequence of the results.

## The mine operator must be required to maintain a record of the results of its health surveillance and the mine operator must notify the regulator of the mine’s health surveillance results if requested by the Regulator. Drafting note: *This must be expressed as being an essential element of a mine operator’s compliance with its general health and safety duties under the Principal Act.*

* 1. The release of health surveillance records must be restricted to protect the privacy of the relevant workers engaged in mining operations. Release of health surveillance records, other than to the regulator, must be prohibited without the written consent of the worker. Workers must have access to their own health surveillance records upon request.
  2. A mine operator must keep records made under this clause as confidential records for at least 7 years and until the worker or workers to whom the record relates ceases or cease to perform work at the mine, or 30 years in the case of records relating to hazards with a cumulative or delayed effect.

## The Regulator may mandate specific health surveillance. The Regulator may delegate this power to any appropriate person.

## The mine operator must notify the regulator when persons at a mine are exposed to levels that exceed the exposure standards set out in Chapter 7 of the Model Work Health and Safety Regulations (hazardous chemicals) and the Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOSHC:1003(1995)].Such notification must occur as soon as reasonably practicable upon receiving the result.

## A worker must be provided with a statement dealing with any exposure he or she may have had to hazardous substances exceeding the national exposure limits during the course of their work at a mine upon the termination of their engagement and upon request.

## Health surveillance must be undertaken in accordance with relevant Australian Standards. These relevant Australian Standards include AS3640 – Workplace Atmospheres – Method for sampling and gravimetric determination of inhalable dust and AS 2985-2009 – Workplace Atmospheres – Method for sampling and gravimetric determination of respirable dust. The mine operator must advise any person who is exposed to levels that exceed the national exposure limits for any hazardous substance as soon as reasonably practicable after becoming aware of such an exposure. The notification must be in writing and must provide the details of the hazardous substance, the level of exposure and the manner of exposure. This is to allow the person to obtain relevant medical assistance or advice.

*[Drafting Note: Review in light of revised WHS Regulations chapter 9]*

**Fitness for work**

* 1. Mine operators must eliminate so far as is reasonably practicable and if it is not reasonably practicable to eliminate, minimise so far as is reasonably practicable the risks to health and safety of people arising from the fitness for work of workers involved in mining operations at the mine. The controls introduced as part of compliance with the obligation will be documented in the health and safety management system. Fitness for work obligations include eliminating or minimising the risks arising from the effects of alcohol, drugs (including over-the-counter and prescription drugs) and fatigue on the ability of workers to perform their work safely.
  2. In the event that the mine operator identifies that drug and alcohol testing is to be used as a control to eliminate or minimise the risks, the Mine Safety Regulations specify that the arrangements for alcohol and drug testing regimes be reached through an agreement between the Mine Operator and a majority of the workers at the mine and the matters in 26.21 and 26.22 below apply.
  3. In relation to any proposed alcohol testing, in the event that agreement cannot be reached within a reasonable timeframe in accordance with paragraph 26.20, the Mine Operator will determine the regime that will apply. That decision would then be the subject of the Issue Resolution provisions under the Principal Act (Part 5 (consultation, representation and participation) Division 5 (issue resolution)).

## In relation to any proposed drug testing, in the event that agreement cannot be reached within a reasonable timeframe in accordance with paragraph 26.20 the Mine Safety Regulations are to provide for a testing regime specified in a Schedule E.

## The Worker Health Control Plan must include the specific control measures contained in the **general** WHS regulations:

* 1. Part 3.1 General Working Environment
  2. Part 3.2 Personal Protective Equipment
  3. Part 4.1 Noise;
  4. Part 4.2 Hazardous work;
  5. Part 4.3 Confined spaces; and
  6. Chapter 7 Hazardous chemicals.

## *Note: In determining other specific controls the mine operator must have regard to any relevant code of practice, including but not limited to:*

* + *How to manage work health and safety risks;*
  + *How to consult on work health and safety;*
  + *Managing the work environment and facilities;*
  + *Managing noise and preventing hearing loss at work;*
  + *Hazardous manual tasks;*
  + *Confined spaces;*
  + *How to Manage and control asbestos in the workplace;*
  + *How to safety remove asbestos;*
  + *Labelling of workplace hazardous chemicals*

**First aid**

## The mine operator is required to keep records of all first aid treatment provided at the mine for a period of 7 years.

# **Emergency Response Control Plan**

## The mine operator must prepare an emergency response plan for the mining operations, commensurate with the nature, size, complexity and risks associated with the Mine and Mining Operations, dealing with the means for responding to a situation or incident involving a risk of serious injury or death.

**Content of emergency plan**

## The emergency response plan must address all aspects of emergency response.

## Without limiting the generality of the obligation above, the emergency response plan must, so far as is reasonably practicable, provide for:

### the coordination and control of emergencies;

### identification of personnel at the mine with functions and responsibility within an organisational structure for emergency response;

### documented triggers for the activation of the emergency response plan;

### the use of communications systems;

### giving timely notice, information and warnings about emergencies to anyone potentially affected;

### measures for isolating the area of an emergency;

### the reasonable availability of trained rescue persons or emergency services at the Mine;

### locating and accounting for persons in the event of an emergency.

### maintaining an accurate record of all persons underground at a mine at any time, and their likely location, which is kept and maintained at the mine and made available at any time for the purposes of emergency response;

### emergency evacuation;

### appropriate transportation from the mine;

### documenting the first aid arrangements including first aid equipment, facilities, services and personnel at the mine;

### providing for all facets of fire fighting including adequate and compatible fire fighting equipment (for example, foam generators), procedures, training and personnel with adequate minimum standards for mines;

### identifying conditions for withdrawal from a mine which must include circumstances where there is an imminent risk to health or safety as part of the emergency evacuation procedure for the mine;[[8]](#footnote-8) and

### a procedure for the prompt notification of local, state and any other relevant emergency services and the mine rescue services.

## In relation to underground mines, emergency response plans must, so far as is reasonably practicable, provide for a number of further matters specific to emergency situations in underground mines, including:

### ensuring there is an effective means of communicating between the surface of the Mine and any part of the mine where persons may be located underground; and

### provision for a suitable number of trained persons and maintained equipment to allow rapid and continuous rescue operations in conditions of reduced visibility and irrespirable and irritant atmospheres to take place at the Mine and to assist the escape or safe recovery of any worker or other person from a Mine where necessary; and

### safe egress of persons from underground parts of the Mine through conditions of reduced visibility and irrespirable and irritant atmospheres (including escape devices and adequately maintained self-rescuers, where appropriate); and

### ensuring appropriate means of egress to the surface; and

### an up-to-date plan of the exits from and refuges in the underground part of the mine; and

### provisions for emergency sealing of a mine from a safe place at the mine (which is out of the direct line of any potential blast);

### provision for the safe positioning of inertisation equipment; and

### provision for training of underground mine workers in donning and changeover of self-contained self-rescuers in a simulated work environment every 3 months.

## **Competent person at surface of underground mine**

## *Drafting note: The nature of some mines means that underground fire has virtually inexhaustible supply of fuel. The consumption of this fuel also generates explosive and toxic gases. Once a fire is out of control, the only practical way of fighting the fire is from the surface with a limited range of techniques. Early action can limit a fire. This is why a competent person is required at the surface of a mine to isolate turn off or reset the power or initiate emergency response.*

## The Mine Operator must ensure that a competent person with the requisite training and authority is at the surface of an underground mine at any time persons are underground.

## The competent person who is on the surface of an underground mine, must be trained to answer alarms, must be capable of electrical switching to either cut or restore power to the underground workings and have authority to take action in the event of an emergency.

## ***Communication and review of emergency response plan***

## The Mine Operator must ensure that the emergency response plan is:

### written and otherwise communicated in plain and simple language;

### reviewed and tested on a regular basis (at least annually) and at any time there is a significant change to mining operations at the mine. Relevant personnel must be provided with training in the emergency response plan including when review and testing occurs. Persons who may need to use paths of egress must be made familiar with those paths and the marking of paths of egress must be such that persons can safety travel on them in conditions of poor visibility;

### *[****Jurisdictional Note:*** *Qld coal mines will also continue to have level 1 exercises periodically on a rolling basis]*

### maintained and contain an up-to-date plan of the mine; and

### amended as necessary to ensure that it adequately provides for the response to incidents involving a risk of serious injury or death.

## The mine operator must ensure that the mine plan identifying the points of egress from and refuges in underground parts of the mine are:

### prepared and reviewed at least once every three months;

### updated when required (including whenever it is defaced or destroyed) to reflect the workings or circumstances of the mine; and

### displayed in a prominent and secure position on the surface of the mine and at strategic places underground.

## The emergency response plan must, so far as is reasonably practicable, be developed in co-ordination with local and/or state and / or specific emergency services.

## The mine operator must be required to:

### make a copy of the emergency response plan accessible to persons identified as having functions and responsibilities in relation to the emergency response plan and to workers at the mine; and

### provide a copy of the emergency response plan to the relevant emergency services.

## Mine operator of underground mines must have additional obligations in relation to ensuring that adequate breathing apparatus and further rescue equipment is provided for persons in underground parts of the mine. The obligations for further rescue equipment will also need to include suitable resuscitation equipment and persons qualified to use it, and an alarm system and procedure for activating it.

## The mine operator of an underground mine must ensure that a person who is to go underground is provided with a self contained rescuer.

## The mine operator may provide the person with a filter self-rescuer if a self-contained rescuer is not available and a risk assessment indicates that that a self contained rescuer is not required to control risks to which the person will be exposed at the mine; and the mine is not a coal mine.

## The mine operator must ensure that the person is trained in the use of, and is able to use, the self rescuer provided.

## A requirement that emergency lighting be provided in certain circumstances must also be included in the Mine Safety Legislation.

**Provision of resources**

## Mine operators must provide adequate resources for the mine to ensure:

### the effectiveness and implementation of the emergency response plan (including mine rescue arrangements); and

### that the relevant facilities and equipment (including communications systems) are regularly inspected and maintained in a fully operational condition.

## Mine operators when providing adequate resources for a metalliferous mine are required to undertake a risk management process in determining what are considered to be adequate resources for the mine. That risk management process must include emergency egress and evacuation, including refuges.

## Where the mine operator has identified that resources, facilities or procedures are required for evacuating persons, the mine operator must ensure that the metalliferous mine has the following features as appropriate for the mine, having regard to the nature and complexity of the mine’s operations:

### a usual way of access;

### signed escapeways independent of the usual way of access. Where the mine operator has identified that refuges for emergencies are required at the mine, (in accordance with the risk management process outlined in drafting instruction above),

## The mine operator must ensure that the mine has the following as appropriate to the mine and mining operations, having regard to the nature complexity of the mine’s operations:

### fresh air bases;

### self‑contained refuge chambers in metalliferous mines;

### secure areas where persons can be protected against the hazard causing the incident which requires the use of the refuge in metalliferous mines.

**Access and Egress – underground coal mines**

## The Mine Operator for an underground coal mine must ensure that:

### the mine has at least two escapeways from the surface of the mine that are separated in a way that prevents any reasonably foreseeable event happening in one of the escapeways affecting the ability of persons to escape through the other escapeway.

### each ERZ1 at the mine where a person works has two escapeways leading to the surface or a refuge. This does not apply to an ERZ1 in the following circumstances:

#### where an inspection is being carried out under the mine’s Work Health and Safety Management System and no one else is working; or

#### in a single entry drive or shaft that is being sunk.

### at least one of the escapeways at the underground coal mine is:

#### an intake airway or a combination of adjacent intake airways; and

#### designated as the primary escapeway; and

#### separated, as far as is reasonably practicable, from all other roadways by separation stoping that is anti‑static, fire resistant and of substantial construction providing for minimal leakage; and

#### the risk associated with fire has been managed so far as is reasonably practicable; and

#### is trafficable by vehicle; and

#### fire fighting equipment is located on, or near, any equipment installed in the primary escapeway.

**Escapeways from underground metalliferous mines**

## *Drafting Note: As indicated in drafting instruction, there is a need for provisions to be incorporated into the mine safety legislation for the emergency response plans to cater for the safe egress of persons from underground parts of the mine and for at least two exits from every underground mine to be in place at any one time. In that regard, the mine safety legislation applicable to metalliferous mines must also provide for escapeways from the underground parts of a metalliferous mine.*

## The Mine Operator of an underground metalliferous mine must ensure that:

### before stoping operations at a level on a mine commences, the mine has at least two trafficable egresses (the escapeways), accessible from all stoping operations to the surface.

### the escapeways are:

#### be located strategically to manage risk;

#### allow for the passage of rescue persons and rescue equipment, including stretchers; and

#### be separated in such a way that an event happening in one of the escapeways would not prevent persons escaping through the other escapeway; and

#### maintained in a safe, accessible and useable condition; and

#### adequately marked or signposted, having regard to the potential for reduced visibility in the event of an emergency.

## **Underground coal mine communication systems**

## The Mine Operator must ensure that the underground mine’s telephonic communication system complies with the following requirements:

### it incorporates an adequate fail safe, or backup, power supply for the system;

### the system’s electrical components installed underground are suitable for use in an ERZ0, unless the components are installed in a drift or shaft being driven from the surface in material other than coal;

## **Adequate airbags and transportation for medical treatment in the event of an emergency**

## The Mine Operator must ensure that air bags are available at the mine to be used in the event of a crush injury and the need to move plant. (*Note: This was a recommendation from the Blee Inquiry in Queensland*).

## The Mine Operator must ensure that either appropriate ambulance service arrangements or a vehicle equipped to transport injured or sick persons is available at the mine at all times while persons are working at the mine.

# **PART 6 – FURTHER REQUIREMENTS RELATING TO WORK HEALTH AND SAFETY AT MINES**

# **Plans of Mines**

* 1. The need for accurate survey plans of mines to be prepared and kept was highlighted by the events at the Gretley incident in New South Wales. As the mine operator has the control and management of the mine, the mine operator is the appropriate duty holder for such a duty.
  2. The mine operator must ensure that accurate survey plans are prepared and kept at the mine. Such survey plans must be updated so that they are always current and be proportionate to the size and complexity of the mine and the risks involved in the mining operations at the mine.
  3. Survey plans must be compiled by a Mine Surveyor. Mines must be referenced to the Geocentric Datum of Australia and the Australian Height Datum.
  4. Mine operators must, so far as is reasonably practicable, be obliged to obtain a copy of all historical survey plans from relevant persons (whether kept by regulators or lease holders which differs between jurisdictions) before commencing mining operations. The mine operator must take all reasonable steps to verify the accuracy of any historical plans including carrying out check surveys.
  5. The regulator may require the mine operator to have a check survey conducted if the Regulator has reason to believe that a plan is inaccurate or incomplete.
  6. Mine operators must provide a copy of the mine survey plans to the regulator as required in a form approved by the regulator.

## Mine operators must provide a copy of the mine survey plans to the regulator upon abandonment of the mine.

## When providing a copy of mine survey plans to the regulator, the mine operator must ensure that the mine survey plans show the status of the mine workings immediately prior to the abandonment.

## The regulator is required to:

### keep copies of any mine survey plans provided to them by a mine operator safe and secure;

### prevent unauthorised alteration or additions to the mine survey plans provided to the regulator by a mine operator;

### make copies of the plan available to any person with a legitimate interest in the land affected or likely to be affected by the mine;

### inform the mine holder of details of any person to whom a copy of the mine plan is given; and

### impose any reasonable conditions regarding examination or supply of a mine survey plan.

* 1. Survey plans are to be reviewed by the mine operator on a regular basis (at least annually) and at any time there is a significant change to the mine.

## The mine operator must ensure that the survey plans specify all relevant aspects of the mine including: surface, underground, access and egress including escape routes, communication systems, extent of mining and seams, ventilation and any specific hazards present at the mine or close to the mine such as water, aquifers, unsealed holes, inaccurately located holes, mine workings, abandoned spontaneous combustion areas, stability of wells in goaf areas. Where a local grid system or AHD system is utilised, the relationship between that system and GDA is established and show on the survey plans.

## Mine survey plans are to be certified by a person with the prescribed competency.

* 1. The Mine Surveyor must ensure that any mine survey plans prepared or verified by the surveyor are accurate.

## A mine operator must provide survey plans or relevant health and safety information to the mine operator of an adjacent mine upon request.

## The mine operator must ensure the security of the survey data against loss, damage or unauthorised access.

## The mine operator must inform the mine surveyor of any variation to mine workings from the mine survey plans.

*DRAFTING NOTE:**An exemption from the above clause is necessary for opal and other small mines.*

*DRAFTING NOTE:**Care should be taken that the drafting of the above clause does not conflict with the relevant jurisdiction specific State Mining legislation with respect to tenement requirements.*

# **Connecting underground development**

## If two (2) working faces are approaching each other the mine operator must ensure that one of the workings is stopped, made safe and barricaded at an appropriate distance from the other working face, having regard to the size and geometry of the respective openings and the ground/strata conditions.

# **Abandoning Mines**

* 1. The mine operator must so far as is reasonably practicable, ensure that if a mine is to be abandoned or discontinued, the mine is safe and made stable and secure before it is abandoned.

## The regulator can step in to render safe an abandoned or discontinued mine and recover the costs of doing so from the mine operator who abandoned the mine.

## All officers of a mine operator to whom the above section relates will be jointly and severally liable in relation to any costs incurred by the regulator in that regard.

(*Note. Check for consistency with the core WHS Mine Safety Regulations*)

1. **Prohibited and Restricted Items in underground coal mines** 
   1. Prohibited items must be defined in the Mine Safety Regulations and be wide enough to include any substance or material that, due to its hazardous nature, exposes persons to a serious risk to their health and safety should that material or substance be taken underground.  A schedule of prohibited items is at Schedule C.
   2. For other type of mines, prohibited items will be determined by the mine operator and documented and implemented in the health and safety management system at the mine.

## A mine operator must, so far as is reasonably practicable, identify items which constitute a hazard to identify items requiring restrictions in order to determine which items should be excluded from the mine to eliminate any assessed risks associated with the hazard.

## An inspector is to have the power to search and inspect a person who is suspected of possessing a prohibited item.

## An underground coal mine’s health and safety management system must be required to provide for a search procedure for searching a person to ensure the person has not taken, or does not take, prohibited items underground at the mine. The search procedure must include provision for the following:

### routine and random searches;

### the frequency, time and place for searches;

### the method of conducting searches, including requirements that the search be conducted by a person of the same sex as the person being searched and that a person must not be requested to undress for the search; and

### ensuring that in time, each of the coal mine’s workers carrying out tasks underground will be searched.

## The mine safety legislation must provide the power for a mine operator of an underground coal mine to conduct searches of persons to ensure the prohibitions contained within the mine safety legislation with respect to prohibited items are being complied with. An underground mine manager may search a person at a mine who is, or who may be going, underground at the mine to ensure that the person has not taken or does not take prohibited items underground. A search under this drafting instruction must be conducted in accordance with the search procedure for the mine.

# **Naturally occurring asbestos**

[*Review via WHS Core and general regulations*]

## The work health and safety management system for a mining operation must include an Asbestos Management Plan where naturally occurring asbestos is present.

* 1. An Asbestos Management Plan must include measures to eliminate the risk of exposure of workers or other persons to asbestos occurring naturally at the mine or, where the exposure cannot be eliminated, minimise the risk to the health of workers and other persons who are exposed.
  2. Specifically, the mine operator’s Asbestos Management Plan must provide for:
     1. developing and implementing measures to detect the presence of asbestos in exposed rock; and
     2. undertaking regular surveillance of mined rock to ensure minimal disturbances of fibrous material; and
     3. developing and implementing measures to assess exposure to airborne fibres; and
     4. adopting measures to ensure that access to areas containing asbestos is strictly controlled and monitored; and
     5. adopting measures for dust containment, collection and handling facilities for the minimisation of airborne fibre levels; and
     6. adopting measures for the suppression of dust at the source and the isolation of workers at the mine from dust by the provision of appropriate equipment and facilities; and
     7. developing and implementing disposal procedures for fibrous waste.

# **PART 7 – NOTIFICATION, INVESTIGATION AND ENFORCEMENT**

# **National Mine Safety Database and Notifiable Incidents**

## The Mine Operator is required to report certain notifiable incidents under the Principal act. In addition, the Mine Safety Legislation must impose an obligation on mine operators to collect, maintain and provide to the regulator information in relation to all injuries, disease and high potential incidents to support the development and maintenance of the National Mine Safety Database as set out in the National Mine Safety Framework Implementation Plan. The purpose of the National Mine Safety Database is to facilitate reliable comparability of industry and jurisdictional data in order to improve health and safety. The specific requirements for the National Mine Data Set information to be collected, maintained and provided to the regulator are contained in Schedule F.

## The provision of National Mine Data Set information for the National Mine Safety Database must be used only for the purpose of data retention, analysis and collection. Such information must not be admissible into evidence in any proceedings; however reporting information under this provision must not enable the mine operator to avoid its obligations to report notifiable incidents under the Principal Act or to avoid any consequential enforcement action.

# **Incident Notification**

## [*DRAFTING NOTE:**For the purposes of these drafting instructions,* ***high potential incidents*** *are to be defined as an event or series of events that cause or have the potential to cause a significant adverse effect on the health or safety of a person but do not necessarily involve the direct exposure of a person to a risk to health or safety.* *Consider the incident notification provisions contained within sections 35-37 of the Model Work Health and Safety Act/Principal Act*.]

## The mine operator is required to report notifiable incidents to the relevant health and safety representative at the mine.

## The mine operator must be under an obligation to notify the regulator of certain mine specific notifiable incidents as soon as reasonably practicable, with written notice to be provided within 24 hours of a fatality and 48 hours for other incidents. In addition, and on the same basis, the Mine Operator must also notify the Regulator of the following incidents as soon as reasonably practicable:

### an event that results in the admission of a person to hospital as an in‑patient;

### any fracture other than a fracture of a finger, toe, hand or foot;

### asphyxia;

### the loss of consciousness of the person;

### imminent risk of explosion or fire;

### entrapment of a person;

### the unplanned immersion of a person in liquid;

### damage to any plant, building or structure such as to impede safe operations;

### damage to, or failure of any part of a powered winding system or a shaft or shaft equipment;

### the unintended activation, movement, or failure to stop of vehicles or machinery;

### a collision involving a vehicle or mobile plant;

### a failure of ground, or of slope stability control measures;

### an air blast;

### a coal or rock outburst

### an escape of fluid under pressure that endangers a person

### an abnormal inrush of fluid or material

### overturning of vehicle, machinery or plant and loss of control of vehicles, plant or machinery .

### where a vehicle, machinery or other plant makes contact with an energised high voltage source;

### a fire in the underground parts of a mine (fire is the presence of flames, not just heat);

### an uncontrolled outburst of gas;

### ejection of fly rock so that it falls outside an exclusion zone (an area from which people are excluded during blasting) or near people;

### an unplanned event causing the withdrawal of a person from the mine or part of the mine;

### an unplanned event that causes only one escapeway from the mine to be available for use;

### a major structural failure of equipment; or

### a fire on a vehicle or plant

### an injury to a person (supported by a medical certificate) that results in or is likely to result in the person being unfit, for a continuous period of at least 7 days, to attend the person’s usual place of work, to perform his or her usual duties at his or her place of work or, in the case of a non-employee, to carry out his or her usual activities

### an illness of a person (supported by a medical certificate) that is related to work processes and results or is likely to result in the person being unfit, for a continuous period of at least 7 days, to attend the person’s usual place of work or to perform his or her usual duties at that place of work,

### electric shock greater than 50 Volts ZC or 120 ripple free Volts DC.

### the first indication that the underground parts of a coal operation are subject to windblast, outbursts or spontaneous combustion

## *Drafting Note: The requirements set out in the preceding drafting instructions, are to be subject to non‑disturbance requirements as set out in section 39 of the Model Work Health and Safety Act/Principal Act.*

## The following high potential incidents must be notified as soon as reasonably practicable to the Regulator:

### initial self‑heating of coal or other material, or any heating of coal in any underground parts of a coal mine;

### an unplanned fall of ground, roof or sides that impedes passage, extends beyond the bolted zone or disrupts production or ventilation or failure of ground support where persons could potentially be present;

### *Drafting Note: definition of “bolted zone” is in the definition section.*

### the burial of machinery such that it cannot be recovered under its own tractive effort;

### a creep or progressive pillar collapse;

### a sudden pillar collapse;

### an event that occurs in an hazardous zone in the underground parts of a coal mine and from which an electric arch is observed or that leaves visible evidence on an electric cable of arching having occurred;

### the in‑service failure of the explosion protection characteristics of explosion protected plant;

### an unplanned ignition, misfire or explosion of a blasting agent or explosive;

### unintended activation or movement of vehicles or machinery that does not present an immediate threat to life or permanent injury;

### a ventilation failure causing a dangerous accumulation of methane or other gas.

* 1. The site of a High Potential Incident must not be disturbed until:

### released by the regulator; and then

### all relevant details about the high potential incident have been recorded and if possible photographed; and

### sufficient measurements have been taken to allow the development of the accurate plan of the site.

## A list of witnesses to the high potential incident must have their contact details recorded.

# **Incident investigation**

## The Mine Operator must investigate all health and safety incidents arising from mining operations.

## Following a high potential incident or notifiable incident, a mine operator must investigate the incident to the extent reasonably practicable. The duty to investigate incidents must include identifying any key safety issues and recommendations arising from the incident and taking action to review and revise the health and safety management system (or its relevant parts) accordingly. The mine operator must prepare a report following the investigation that includes causes of the incident and the recommendations to prevent such an accident occurring in the future.

* 1. A mine operator must report the findings of its investigation into a high potential incident or notifiable incident to the regulator within 30 days.[[9]](#footnote-9)

# **Release of Information Regarding Incidents by Regulator**

## *Drafting Note: The proactive release of information by the regulator assists the industry with the development of improved health and safety management and prevention strategies.*

## The Minister or the regulator or a Chief Inspector may make or issue a public statement indentifying, and giving information about, the following-

### the commission of offences against this Act and the persons who commit the offences;

### investigations conducted under this Act about serious accidents;

### action taken by the regulator or inspectorate to enforce this Act;

### the cancellation of a practising certificate.

## The public statement may identify particular information and persons.

## The Minister and the regulator and the Chief Inspector must not issue a public statement under this section unless satisfied that it is in the public interest to do so.

## The regulator may release an incident alert in relation to any mining incidents known to the regulator that may be of assistance to mine operators, workers and others in discharging their obligations under the mining legislation.

## The regulator and each officer and agent of the regulator will not be liable for any loss or damage caused by the exercise of their function in good faith under this section (the making of public statements and release of information regarding incidents).

## Incident alerts released under this part are not admissible in any proceedings brought under the mining legislation.

# **Notification of high risk activities**

## It is proposed that Mine Safety Regulations require mine operators to give notice of certain high risk activities to the regulator, and prohibit such activities being carried out until notice is given and the notice period has elapsed.

## The mine operator must, so far as is reasonably practicable, consult the health and safety representative in relation to any proposed high risk activity including the timing of commencement of the high risk activity.

## The mine operator must, so far as is reasonably practicable, ensure that a high risk activity contained within the high risk notification schedule is not carried out at or in relation to the mine unless, before the activity is commenced:

### the mine operator has given notice of the activity to the regulator in accordance with the high risk notification schedule; and

### the waiting period prescribed for the relevant high risk activity in the high risk notification schedule has elapsed.

## The regulator may vary the length of time prescribed in the high risk notification schedule in relation to a particular high risk activity in writing to an individual mine operator.

## The notice of the high risk activity provided by a mine operator to the regulator must, so far as is reasonably practicable, contain at least the following:

### the nature of the high risk activity;

### the intended commencement date for the high risk activity; and

### the information prescribed in the schedule to this clause for the relevant high risk activity.

## A notice under this drafting instruction must, so far as is reasonably practicable, be provided in the prescribed form.

## Those activities triggering a high risk notification are to be described in the schedule in the legislation unless otherwise determined by the regulator.

## The mine operator may submit a notification form electronically or in paper form.

## The notification is deemed to be made when the regulator acknowledges receipt of the notification. The regulator is to provide acknowledgement of the receipt of the notification in writing.

## The regulator may request further information about the activity between the time of the mine operator’s notification of the high risk activity and the time when the mine can conduct the high risk activity.

## A mine operator cannot undertake high risk activity work unless the mine operator complies with the requirements of this drafting instruction. In order to conduct high risk activity work under this drafting instruction, the mine operator must, so far as is reasonably practicable:

### prepare the information set out in column 3 of the high risk notification schedule;

### give notice in accordance with column 2 of the high risk notification schedule;

### not commence high risk activity work until the notice period in column 2 of the high risk notification schedule expires; and

### ensure that any high risk activity undertaken at the mine once the notice period in column 2 has expired, is conducted in accordance with the information which has been supplied to the regulator under column 3 of the high risk notification schedule.

## If the mine operator establishes a safer means of undertaking the work during the notification period or during implementation, they may perform the work in accordance with that method after notifying the regulator.

## Acknowledgment by the regulator does not mean approval.

### **Proposed High Risk Notification Schedule**

| **Applies to** | **Column 1**  **High risk activity** | **Column 2**  **Length of time between notification and when activity can be undertaken** | **Column 3**  **Information to be supplied to regulator** |
| --- | --- | --- | --- |
| Underground mines | Single entry development, (being a development of a roadway or a drift for more than 200 metres without the formation of an intersection) | 1 month | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place  3 An engineering drawing, endorsed by the underground mine manager, of the work covered by the notification |
| Underground coal mines | Sealing, otherwise than in an emergency when an explosive atmosphere may result  Note: in an emergency or change in sealing method, the Mine Operator must take reasonable steps to notify an inspector then confirm it in writing as soon as practicable | 1 month unless notice has been given as part of a notice for secondary extraction | 1 Proposed location of the seals and areas in the mine to be sealed  2 Proposed sealing procedure and summary of risk assessment for risks identified and controls to be put in place  3 Any evidence of ignition sources being present in the area to be sealed  4 Predictions of the rates at which methane and other gases will accumulate in the sealed area  5 The gas monitoring procedures to be carried out during and after the sealing |
| Underground mines | Working within an inrush control zone | 1 month where the potential source of inrush cannot be inspected, otherwise 1 week | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place  3 An engineering drawing, endorsed by the underground mine manager, of the work covered by the notification |
| Underground metalliferous mines | Newly devised method of mining a rise involving drill and blast and entry to the rise | 1 month | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place  3. Details of methods to be used and the type of equipment  4. Copy of a mine plan showing an alternative means of travel to and from the face during construction |
| Underground coal mines | Injection or application of polymeric material for ventilation or strata | 24 hours | 1. Nature of material to be used  2. Copy of the MSDS for the material  3. A summary of risks identified and controls to be put in place |
| Underground coal mines | Hot work in an explosion risk zone underground (an explosion risk zone is any area where the concentration of methane is greater than 0.5%) | 1 month  Initial submission of Hot Work Management Plan  24 hours  Each hot work occasion thereafter | 1 Purpose of the hot work  2 Copy of the Hot Work Management Plan  3. A summary of risks identified and controls to be put in place |
| All mines | Highwall mining (mining by entry into a previously formed high wall and during which no people are underground) | 1 month | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place  3 An engineering drawing, endorsed by the underground mine manager, and a plan certified by a Mine Surveyor, of the work covered by the notice |
| All mines | Entering a highwall mining excavation | 48 hours | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place  3 Details of the competencies of the person appointed to control the highwall mining activity whilst any person is inside the highwall mining excavation  4 Details of the competencies of the person(s) entering the highwall mining excavation  5 Details of self rescue equipment to be carried by persons entering the highwall mining excavation |
| All mines | Shot firing underground, where shotfiring has not been undertaken within a year prior to the intended time of shot firing | 1 day | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place  3. Details of the location of shot firing |
| Underground coal mines | Driving an underground roadway with a width greater than 5.5 metres | 7 day | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place |
| Underground coal mines | Widening an existing underground roadway | 7 days | 1 Extracts of relevant principal hazard management plans  2 A summary of risks identified and controls to be put in place |
| Underground mines | Shaft or drift sinking, raise boring or development of a new underground mine entry | 3 months | 1 Method of working and details of plant and equipment to be used  2 Extracts of relevant principal hazard management plans  3 A summary of risks identified and controls to be put in place |
| Underground coal mines | Installation of a booster fan underground | 3 months | 1 Details of the proposed fan location  2 Extracts of the relevant ventilation control plan  3. A summary of risks identified and controls to be put in place |
| Underground mines | The introduction for the first time of a vehicle with a non‑flameproof (fire protected) diesel engine to an underground part of a coal operation that is not an explosion risk zone | 3 months | 1 Extracts of relevant principal hazard management plans  2 A summary how the risk of introduction has been assessed and the controls put in place  3. Details of procedures to be followed in the case of failure of a control |
| Underground coal mines | The use of voltages in excess of 4000V in a Explosion Risk Zone 1 for electrical plant and cables associated with longwall mining (an ERZ1 is an area where the concentration of methane is between 0.5% and 2.0%) | 12 months | 1 Date of intended installation  2 For the plant and cables operating at voltages in excess of 4000V, a summary of risks identified and controls to be put in place |
| Coal mines | The establishment or discontinuance of emplacement areas | 3 months | 1 An overview of the lifecycle of the emplacement area including: timeframes, design, construction, reject materials, transport, treatment, inspections, decommissioning.  2 A summary of risks identified and controls to be put in place, including details of ongoing monitoring  3 Engineering plans, endorsed by the manager of mining engineering, of the work covered by the notice, showing all existing and proposed emplacement areas, geotechnical designs and any other relevant details  4 Survey Plans endorsed by a Mine Surveyor |
| Coal mines | Secondary extraction in a coal   * Pillar or pillar dimension reduction * Longwall * Miniwall * Shortwall   (A notification is required in relation to pillars where the following standards are deviated from:  (a) the dimension of a pillar is less than:  (i)a distance that is equal to one‑tenth of the thickness of the cover (to the surface); or  (ii)10 metres, whichever/s the greater; and  (b) the width of the roadways, bords, cut‑throughs, headings and pillar splits not 5.5 metres except for that part of a roadway forming an intersection with another roadway | 4 months | 1 Preparation of Safety Management Plan, detailing the authoritative sources used in determining that the proposed method of work can be done safely  2 Extracts of relevant principal hazard management plans  3 A report on risks identified and controls to be put in place  4 Engineering plans, endorsed by the underground mine manager, of the work covered by the notification, showing all relevant details  5 Dimensional plans showing the manner and sequence of extraction  5 Emergency response plans, showing details of procedures to be followed in the case of failure of a control  6 Procedures for the recovery of buried and immobile mining equipment, at the edge of or in a goaf |
| Underground coal mines | Barrier Mining  (defined as: the mining of a barrier or protective pillar against the external boundaries of the mine, against any outcrop of the seam and between any underground workings and any open cut workings)  **Note:** A notification is triggered when the width of the barrier is proposed to be less than 40 metres between adjoining workings of adjacent mines. | 3 months | 1 Extracts of relevant principal hazard management plans  2 A report on risks identified and controls to be put in place including details on identified interactions between adjoining operations and hazards  3 Survey plans certified by a Mine Surveyor |
| Underground coal mines | At Coal mines:   * Multi-seam mining * Formations of small pillars * Shallow depth of cover * Mining under massive roof conditions * Mining under significant bodies of water | 4 months | 1 Extracts of relevant principal hazard management plans  2 A report on risks identified and controls to be put in place  3 An engineering drawing, endorsed by the underground mine manager, of the work covered by the notification  4. Survey plans certified by a Mine Surveyor |
| Underground coal mines | Working within outburst control zones  For the purpose of this item an **outburst control zone** is any area where the total insitu gas content and gas composition, measured in accordance with AS3980 or an equivalent standard, is greater than 9m3/tonne for CH4 or 5m3/tonne for CO2, or for a mixture of these two gases a gas content in the proportion of the percentages of each gas between these two limits | 3 months | 1 Extracts of relevant major hazard management plans  2 A summary of risks identified and controls to be put in place  3 A analysis of how the proposed method of mining minimises the risk of gas outbursts.  4 An engineering drawing, endorsed by the underground mine manager, of the work covered by the notification  5. survey plans certified by a Mine Surveyor.  6 The extract from the emergency response plan showing details relevant to outbursts |
| All mines | Commissioning or use of Mine Shaft and Winding Operations plant | 3 months | 1 Extracts of relevant major hazard management plans  2 A summary of risks identified and controls to be put in place 3. Evidence of how hazard identification and risk assessment methods have been used in the design of the shaft or winder to minimise the risks to health and safety of persons4. Details of any design or performance standards that have been relied on in the construction of the shaft or winder. |
| Underground mines | The use of voltages in excess of 1200V in a explosion risk zone 1 for electrical plant other than electrical plant and cables associated with longwall mining  (an ERZ1 is an area where the concentration of methane is between 0.5% and 2.0%) | 12 months | 1 Date of intended installation  2 Extracts of relevant major hazard management plans  3 A summary of risks identified and controls to be put in place |

1. **Additional enforcement powers in relation to Mines** 
   1. Given the nature of mining operations and the hazards and risks involved, it is proposed that the Mine Safety Regulations consistent with existing jurisdictional legislation provide the regulator with additional enforcement powers in relation to mining operations.
   2. The additional powers proposed for inclusion in the Mine Safety Regulations are:

### the power for the regulator to impose, based on a reasonable opinion in relation to risk formed by an inspector, proactive directions in relation to action required of the mine operator including the power to require an independent technical study or expert report to be carried out and the power to proactively direct a mine operator or other person to:

#### ensure a mine worker is competent;

#### carry out a test;

#### review the health and safety management system (including principal hazard management plans and principal control plans);

#### suspend operations or part thereof with ineffective health and safety management system;

#### change or alter an activity being undertaken at a mine to reduce risks to health and safety;

#### separate part of the mine;

#### isolate or designate a site; and

## The exercise by the regulator or their delegates with any additional proactive powers is deemed to be a reviewable decision under Part 12 of the Model Work Health and Safety Act/Principal Act (review of decisions). However, an appeal of a direction under 6.2(1)(d) does not act as an automatic stay to the direction.

## While the exercise by the regulator or their delegates with any additional proactive powers is deemed to be a reviewable decision under Part 12 of the Model Work Health and Safety Act/Principal Act (review of decisions), only proactive powers exercised by the regulator or Chief Inspector themselves are to be automatically subject to external review. Decisions by other delegates of the regulator are to first be reviewed internally.

## The regulator may exercise any additional proactive powers away from the mining operations.

## The regulator may delegate any additional proactive powers to inspectors except for the power to require an independent technical study or expert report which can only be exercised by the Chief Inspector.

# **PART 8 – MISCELLANEOUS PROVISIONS**

# **Boards of Inquiry**

## The Mine Safety Regulations may provide for the establishment of a board of inquiry in the event that a serious accident or notifiable incident occurs or when the minister reaches the conclusion that an investigation of a safety matter is necessary.

## The Minister may establish an official inquiry by notice in the Gazette which contains the terms of reference for the board of inquiry.

## The purpose of a board of inquiry is to inquire into the nature, circumstances and causes or potential causes of the accident or incident or safety matter and provide findings and recommendations in order to avoid accidents or incidents in the future.

## The board of inquiry may investigate accidents, notifiable incidents and other safety related matters including high potential emerging and systemic issues. A board of inquiry may inquire into but not limited to the following matters:

### any event or dangerous occurrence causing death or serious injury at a mining operation and its causes and circumstances;

### any dangerous occurrence at a mining operation and its causes and circumstances;

### any practice or other safety matter which in the opinion of the Minister adversely affects or is likely to adversely affect the health or safety of persons at a mine

### any emerging or systemic issues affecting health and safety of persons in a mine.

## The Minister must, so far as is reasonably practicable, make a public statement (which could be the original or further notice in Gazette or public statement not in the Gazette) addressing when a board of inquiry will report. The statement may also address matters including the membership of the board, who is the chairperson of the board and its terms of reference. A prior board of inquiry or investigation by a regulator, coroner or other body inquiring into the same matter does not impede the Minister’s power to establish a board of inquiry.

## The Minister is empowered to establish either a single member or multi‑member board of inquiry with a chairperson. If a single person is appointed then one or more assessors or expert advisers must be appointed. Assessors and expert advisers may also be appointed by the Minister to support members of multi‑member boards of inquiry. Members of the board of inquiry are entitled to be paid fees and allowances.

## An assessor or expert adviser appointed to assist members of a board of inquiry but not appointed as a member of a board of inquiry should have the power to advise the board of inquiry but should not have the power to adjudicate on any matter before the board of inquiry. Members of a board of inquiry may consult, either collectively or individually where there is more than one member, with assessors and expert advisers who have been appointed to assist the members of the board of inquiry.

## The Minister may not appoint a person to be a member of a board of inquiry unless the Minister is satisfied that the person concerned:

### has appropriate qualifications and experience; and

### does not have an interest that may raise a conflict with the proper performance of the person’s proposed powers and functions as a member of a board of inquiry. Those provisions should also apply to any assessors or expert advisers who are appointed as members of a board of inquiry.

## The conditions of appointment of members of board of inquiry are at the discretion of the Minister. The Minister may make changes to the membership of a board of inquiry should the Minister decide that such a change is necessary. Where a change of membership of the board of inquiry occurs, the board of inquiry is not to be affected by a change in its membership. That is, the inquiry may continue unimpeded by changes in its membership.

## The chief executive of the Minister’s department is to arrange for services of staff and financial matters for board of inquiries as soon as reasonably practicable after the establishment of the board of inquiry. The services of staff may include the services of officers or other employees of a relevant department in the jurisdiction and other persons. Arrangements for services of staff and financial matters are to be arranged in consultation with the members of the board of inquiry.

## The chairperson of the board of inquiry is to provide at least 14 days notice of the time and place of any hearings of an inquiry to any person that the chairperson considers may be involved in a serious incident or high potential incident the subject of the inquiry.

## A board of inquiry has the following powers:

### to determine its own procedures except as provided by the mine safety legislation;

### to summons or require a person to appear at a time and place to give evidence and produce any documents that are specified in the summons;

### to require a person appearing at an inquiry to produce documents;

### to inspect a document, thing or, photograph relevant to the inquiry;

### to copy or photograph any document or thing relevant to the inquiry;

### to keep a document or thing while it is necessary for the inquiry;

### to permit a person who has a legitimate interest to inspect, copy or photograph a document or thing which is in the board’s possession at a reasonable time and place under such directions as the board of inquiry sees fit;

### to hold hearings;

### to act in the absence of any person who has been issued with a summons to appear; and

### to receive evidence on oath or by statutory declaration/ written statement either sworn or affirmed;

### to adjourn the board of inquiry where necessary;

### to require a person appearing at an inquiry to answer questions.

## Where a person is required to answer questions at an inquiry as above, the person must answer the question and the person is not excused from answering questions because it might incriminate them or make them liable to a penalty. However, the information they provide cannot be used against them in any legal proceedings except in any proceedings for an offence of failing to answer questions at the inquiry outlined above. Such requirements preventing the use of any information provided by witnesses to the inquiry are necessary in order to protect witnesses in this particular context where the normal rules of evidence do not apply.

## The board of inquiry can determine the manner in which it conducts its proceedings including whether the hearings (or parts thereof) will be public or private. The board of inquiry must keep a record of its proceedings. A board of inquiry in the conduct of its inquiry:

### is not bound to act in a formal manner;

### is not bound by the rules of evidence;

### may inform itself on any matter within its terms of reference in any way that it considers appropriate;

### may decide the procedures to be followed for the inquiry; and

### may require any person who is required to appear as a witness at the board of inquiry to take an oath or affirmation.

## Rights of witnesses should be dealt with in the board of inquiry provisions. While the board of inquiry should be allowed to determine the manner in which it conducts its proceedings, when conducting its inquiry, the board of inquiry should be required to:

### observe natural justice;

### afford all persons required to give evidence or produce documents at the inquiry procedural fairness;

### not make any adverse findings or recommendations against a person without affording them an opportunity to appear before the board of inquiry and respond to the allegations; and

### give a person involved in the serious accident notifiable incident or other safety matter, the subject of the inquiry, the opportunity of defending all claims made against the person in the inquiry and any intended adverse findings or recommendations of the board of inquiry prior to their finalisation.

## A board of inquiry should be provided with the discretion to grant a request for a person’s evidence to be taken in private on the ground that that evidence relates to commercial interests which are commercial-in-confidence or contain commercially sensitive information and not to publish such evidence that is provided which meets that criteria. Such a provision should not in any way be taken as limiting the powers of the board of inquiry.

## A person may be represented by a legal practitioner before the board of inquiry. A legal practitioner means a barrister, a solicitor, a barrister and solicitor, or a legal practitioner, of the High Court or of the Supreme Court of any State or Territory. However a person who is legally represented must also attend in person.

## The reasonable costs of witnesses must be met by the board of inquiry.

## It is an offence to impede the board of inquiry in the exercise of its functions or to mislead or obstruct the board of inquiry in the exercise of its functions. Provision should also be made for contempt of the board of inquiry. In that respect, requirements should include that a person must not deliberately interrupt a board of inquiry, create or continue a disturbance in or near a place where a board of inquiry is being conducted, or do anything that would be contempt of court if the members of a board of inquiry were acting as a judge of a court. Contempt of the board of inquiry should be an offence.

## There should be a provision which allows the inquiry to continue despite any court proceedings. That provision should provide that the inquiry may start or continue, and a report may be prepared or given to the Minister, despite a proceeding before any court or tribunal, unless a court or tribunal with the necessary jurisdiction orders otherwise.

## Every member of a board of inquiry should be provided with the same protections and immunity as a judge of the Supreme Court of [the relevant State jurisdiction] in the exercise of his or her functions and powers as a member of the board of inquiry.

## A person who is assisting the board of inquiry as an assessor or expert advisor who is not appointed as a member of a board of inquiry has the same protection as an expert witness in a proceeding before the Supreme Court of [the relevant State jurisdiction].

## A legal practitioner or other person appearing before a board of inquiry has the same protections and immunity as a lawyer appearing for a party in a proceeding in the Supreme Court of [the relevant State jurisdiction]. A person who is summoned to attend or appear before the inquiry as a witness has the same protection as a witness in a proceeding before the Supreme Court of [the relevant State jurisdiction].

## There should be provisions with respect to offences against the requirements in relation to summonses issued to witnesses. Offence provisions should also apply to the requirement to answer questions when giving evidence at a board of inquiry.

## A person who is served with a summons to appear to give evidence at a board of inquiry must not, without reasonable excuse, fail to attend as required by the summons. The person appearing at a board of inquiry who is required to give evidence must not, without reasonable excuse, fail to produce a document that the person is required to produce as above.

## Where the offences contained within this non-core (official inquiries) provide for reasonable excuses, in relation to any acts or omissions made by witnesses who are required to appear before the board of inquiry, reasonable excuses should include:

### in relation to acts or omissions made by persons summoned as a witness before the board of inquiry any excuses applicable for an act or omission of a similar nature by a person summoned as a witness before a court of law;

### any excuses applicable for an act or omission of a similar nature made by a witness appearing before a court of law;

### legal professional privilege.

## A defence should also be provided in relation to offence provisions with respect to failures to produce a document or other thing that the board of inquiry has required to be produced. It should be a defence in that context if the document or thing required by the board of inquiry was not relevant to the matters into which the board was enquiring as evidenced by its terms of reference, broadly construed.

## It is an offence to intentionally give evidence or produce documents that a person knows to be false or misleading with respect to any matter which is a matter material to the matters being enquired into by the board of inquiry. It is an offence to bribe a witness. There should similarly be a specific offence with respect to preventing witnesses from attending once they have been summoned to attend a board of inquiry.

## Offences contained within this drafting instruction should be offences of strict liability. That is, the defence of mistake of fact should be available for all offences in this drafting instruction.

## Proceedings in respect of any offence under the board of inquiry provisions may be instituted by way of action, summons or other appropriate proceedings in the Supreme Court of [the relevant State jurisdiction] by the Director of Public Prosecutions in [the relevant State jurisdiction] or by any person who is prescribed in the mine safety regulations in [the relevant State jurisdiction].

## The board of inquiry must provide the Minister with a written report.

## The report of a board of inquiry must be tabled in a House of Parliament within 28 days and therefore made available to the public unless the Board of Inquiry determines that the report or parts thereof must not be published.

## The board of inquiry must report based on its terms of reference.

## The mine safety legislation should provide that no appeal lies from any decision, determination finding or recommendation of a board of inquiry.

## The board of inquiry may have access to legal practitioners to assist it. The board of inquiry should be provided with a legal practitioner who is appointed by the Minister to assist the board of inquiry. Any such person who is appointed to assist the board of inquiry is permitted to examine or cross examine any witness on any matter within the board of inquiry’s terms of reference should the board of inquiry think that is proper and relevant to the inquiry. Any witness so examined or cross examined should be provided with the same protection and be subject to the same liabilities as if being examined by any of the members of the board of inquiry. Any persons who are legally represented at the board of inquiry may similarly subject witnesses to cross-examination should members of the board of inquiry consider it appropriate for such cross-examination to be conducted.

# **Mine Rescue**

* 1. A mine operator or other duty holders at the mine on a regular basis conducting mining operations will not necessarily have the required resources at the mine to sufficiently undertake rescue operations should they become necessary.

## As the key duty holder under the Mine Safety Regulations, it is appropriate for the mine operator to be responsible for ensuring that there are suitable arrangements in place at the mine for mine rescue. Those arrangements may include the use of specialised rescue services or the assistance of personnel from other mines as appropriate for the size, nature and complexity of the mine. The mine operator must make provision for mine rescue and have such resources for mine rescue at the mine as is reasonably practicable considering such factors as external emergency services, local community services and the geographical location of the mine.

## Underground coal mines must enter into a mine rescue agreement with an accredited mine rescue corporation.

## *DRAFTING NOTE:* *Not all jurisdictions have accredited mine rescue corporations.*

# **Mine records**

* 1. There must be a requirement for a mine operator to keep a mine record. The contents of the mine record must include:
     1. notices, directives, reports, findings and recommendations which arise through monitoring and enforcement action of the Regulator under the Principal Act and the Mine Safety Regulations and any notices issued under Part 5 (consultation, representation and participation)), Division 7 (provisional improvement notices) of the Principal Act. These must also be displayed in a prominent place at the mine for at least 28 days;
     2. any records or reports about all notifiable incidents and high potential incidents; and
     3. original records from the supervisor of each outgoing shift to the supervisor of the incoming shift in relation to matters relating to health and safety at the mine, including information in relation to the state of the mine workings as at the end of the outgoing shift.
  2. The mine record is essentially a repository of information about prior incidents and risks to health and safety at the mine, and as such all workers at the mine must have access to the information in the mine record as it is information which relates to risks to their health and safety. The mine record duty must include that the mine record is easily accessible to workers at the mine.
  3. The mine record could be a single record or it could be several records and may be kept in hard copy or electronically as long as it is an easily accessible centralised repository of information relating to risk to the health and safety of workers at the mine.
  4. When a new mine operator is appointed, the previous mine operator must provide the mine record of the previous 7 years to the new mine operator.
  5. There must be a requirement for the mine operator to make the mine record available to a regulator upon request.

## Persons must not knowingly destroy, deface or enter false or misleading information into the mine record.

*DRAFTING NOTE:**Care should be taken that the drafting of the above clause does not conflict with the relevant jurisdiction specific State Mining legislation with respect to tenement requirements.*

*DRAFTING NOTE:**The definition of a mine record provided for the purposes of this provision does not include any heath and safety records relating to a worker.*

1. **Exemptions**
   1. The regulator must be empowered by the Mine Safety Regulations to exempt a person, mine, part of a mine or a class of mines, or a mining operation or class of mining operation, from having to comply with the Mine Safety Regulations, or a specified provision of the Mine Safety Regulations. The exemption must be given by way of written notice or gazette.
   2. The regulator may limit the exemption to a set period of time and / or impose any conditions on the exemption as it considers fit. The time period and conditions are to be included in the notice of exemption.

*DRAFTING NOTE: This issue is being considered more broadly in the general Work Health and Safety Regulations and needs to be aligned with those Regulations when they become available.*

# **Codes of practice**

**Approved codes of practice**

## The Minister may approve a code of practice for the purposes of the [Mine Safety Act]

and may vary or revoke an approved code of practice.

## The Minister may only approve, vary or revoke a code of practice under 43.1 if that code of practice, variation or revocation was developed by a process that involved consultation between:

### the Governments of the NSW, Queensland and Western Australia; and

### unions; and

### employer organisations.

## A code of practice may apply, adopt or incorporate any matter contained in a document formulated, issued or published by a person or body whether:

### with or without modification, or

### as in force at a particular time or from time to time.

## An approval of a code of practice, or a variation or revocation of an approved code of practice, takes effect when notice of it is published in the Government Gazette or on such later date as is specified in the approval, variation or revocation.

## As soon as practicable after approving a code of practice, or a varying or revoking an approved code of practice, the Minister must ensure that notice of the approval, variation or revocation is published in the Government Gazette and a newspaper circulating generally throughout the [relevant State].

## The Regulator must ensure that a copy of each code of practice that is currently approved, and each document applied, adopted or incorporated (to any extent) by an approved code of practice is available for inspection by members of the public without charge at the office of the regulator during normal business hours.

**Use of codes of practice in proceedings**

## This section applies in a proceeding for an offence against the Mine Safety Act.

## An approved code of practice is admissible in the proceeding as evidence of whether or not a duty or obligation under this Act has been complied with.

## The court may:

### have regard to the code as evidence of what is known about a hazard or risk, risk assessment or risk control to which the code relates, and

### rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

## Nothing in this Drafting Instruction prevents a person from introducing evidence of compliance with this Act in a manner that is different from the code but provides a standard of work health and safety that is equivalent to or higher than the standard required in the code.

# Schedule A Competency and functions

**Non-Core Schedule: STATUTORY POSITIONS AND COMPETENCIES IN MINE SAFETY**

*This Schedule material covers three types of competency:*

* *Section 1 lists safety-critical positions, roles and functions which must be undertaken at the mine by holders of BOE-issued practising certificates;*
* *Section 2 lists safety-critical positions, roles and functions which must be undertaken at the mine by holders of BOE prescribed and published qualifications or competencies (but not a BOE practising certificate);*
* *Section 3 lists identified safety positions, roles and functions which if required to be undertaken at the mine must be undertaken by a person with specified qualifications or competencies set by the BOE.*

*The positions listed need not be full time depending on the size, risk and complexity of the mining operations and may be contracted.*

*There may be more than one person appointed to these statutory positions depending on the size, risk and complexity of the mining operations.* **Safety-critical roles & functions which must be undertaken at the mine by holders of BOE-issued practising certificates**

**A. Underground Mine Manager – Coal Underground**

|  |
| --- |
| * Control and manage all underground activity relating to the operation * Monitoring work practice to ensure compliance with regulations * Monitoring work practice to ensure safe working of all mine workers * Monitoring to ensure safe work practice is not compromised by quantity and quality of the output of mine workers * Resolution of complex and non-routine safety matters * Ensure effective communications including for shift handovers * Ensure work health and safety management plans are implemented in the workplace * Must advise the SSE of work health and safety standards regarding the extraction of the mineral * Must bring any significant deviation from those standards and practices and any risks to health and safety that they become aware of to the attention of the SSE * Oversee the safety duties performed by underground workers * Sign off on monthly ventilation reports prepared by the Ventilation Officer * Responsible for ensuring there is:   + Efficient ventilation of the mine   + Sealing of the mine in an emergency and sections of the mine as they are worked out   + Effective Strata control   + Effective emergency plan for the underground workings   + Safe storage and use of explosives   + Effective gas monitoring systems and the monitoring thereof   + Regular and effective inspection areas and zoning of the underground   + Safe Hot work performed underground   + Ensuring incombustible sample testing results are marked on mine plan showing boundaries of ERZ locations as soon as reasonably practicable after the mine operator receives the result   + Effective distribution and management of incombustible dust. |

**B. UnderManager – Coal Underground (can be more than one)**

|  |
| --- |
| * Monitoring work practice to ensure compliance with regulations * Monitoring work practice to ensure safe working of all mine workers * Monitoring to ensure safe work practice is not compromised by quantity and quality of the output of mine workers * Resolution of complex and non-routine safety matters * Ensure work health and safety management plans are implemented in the workplace * Must bring any significant deviation from those standards and practices and any risks to health and safety that they become aware of to the attention of the Underground Mine Manager * Reports directly to the Underground Mine Manager. |

**C. Electrical Engineering Manager – Coal Underground**

|  |
| --- |
| * Monitor the implementation of the electrical engineering control plan including reviewing and revising as necessary. * Analysis, design, and maintenance of electrical systems. * Selection and operation of power systems, electronics, control systems, signal processing and telecommunications systems. * Advise the SSE of health and safety standards and practices for electrical engineering. * Advise the SSE of health and safety and health standards regarding the electrical installations and the supply of electrical power at the mine * Bring any significant deviation from the electrical engineering standards or practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**D. Mechanical Engineering Manager – Coal Underground**

|  |
| --- |
| * Develop any new mechanical engineering control plan * Monitor the implementation of the mechanical engineering control plan, including reviewing and revising as necessary * Analysis, design, and maintenance of mechanical systems * Selection and operation of mechanically powered machinery for production purposes * Operation of machines and tools * Advise the SSE of work health and safety standards and practices for mechanical engineering * Advise the SSE of work health and safety and health standards regarding the mechanical installations at the mine * Must bring any significant deviation from the mechanical engineering standards or practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**E. Ventilation Officer – Coal Underground**

|  |
| --- |
| * Assist with the development of any new ventilation control plan * Monitor the implementation of the ventilation control plan, including reviewing and revising as necessary * Ensure the provision of air of adequate quality for mine workers to breathe * Ensure the quality of the mine air is measured and recorded * Ensure that ventilation systems result in the dilution of both natural and introduced (e.g. diesel exhaust) gases * Ensure that ventilation systems result in the dilution or removal of dust * Ensure that ventilation systems result in the provision of optimum temperature for mine workers and machinery. * Ensure all ventilation control devices at the mine are properly constructed and maintained * Take charge of any ventilation system change in the mine by giving directions, or by being present, when the change is happening * Responsible to the Underground Mine Manager for the ventilation standards, gas monitoring systems and VCDs employed at the mine * Bring any significant deviation from the ventilation standards or practices and any risks to work health and safety that they become aware of to the attention of the underground mine manager * Prepare each month, a ventilation report about the mine ventilation system; and if the ventilation system is changed, as soon as reasonably practicable after the change, a report detailing the system before and after the change and seek to ensure that each report is signed by the Underground Mine Manager or their delegate. |

**F. Mine Deputy – Coal Underground**

Note: depending on the size and complexity of the mine there may be multiple deputies who are supervisors.

|  |
| --- |
| * Monitoring workplace practice to ensure compliance with regulations in the Deputy’s district (section of the mine/allocated area of responsibility) * Direct supervision of working miners to ensure safe working including:   + ensuring a high quality of work performed   + worker safety is not compromised by the quantity and quality of the output of mine workers * Undertake inspections to ensure a safe workplace of: face, outbye areas and explosion risk zones as detailed by the Underground Mine Manager or in that person’s absence the Undermanager * When operations at a mine have ceased, prior to recommencement and workers going underground, inspect relevant mine areas * Resolution of complex and non-routine safety matters * Supervise the application of mine work health and safety management plans to the workplace and give instructions provided it is in their area of expertise * Use of explosives to the extent permitted by their shotfirer’s licence and/or supervising shotfiring * Carry out inspections and be present when hot work is being carried out and conduct inspections relevant to hot work * Receive advice of dust testing in relation to potential explosions * Advise the Underground Mine Manager or Undermanager of work health and safety standards regarding the extraction of the mineral * Bring any significant deviation from those standards and practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**G. Surface Mine Manager – Coal Surface**

|  |
| --- |
| * Control and manage all activities relating to surface operations * Ensure the application of work health and safety mine management plans to the workplace * Monitor work practice to ensure compliance with regulations * Monitor work practice to ensure safe working of all mine workers * Monitoring to ensure safe work practice is not compromised by quantity and quality of the output of mine workers * Resolution of complex and non-routine safety matters * Advise the SSE of health and safety standards regarding the extraction of the mineral * Bring any significant deviation from those standards and practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**H. Open Cut Examiner – Coal Surface (can be more than one depending on size and risk of the mining operation)**

|  |
| --- |
| * Implementing and maintaining a high level of safety onsite while also supervising and coordinating production operations in an open cut mine or quarry * Overseeing the safe undertaking of activities and interaction of mine workers * Ensure worker safety by monitoring compliance with regulations in the allocated area of responsibility * Direct supervision of working miners to ensure their health and safety including:   + Responsibility for safe working of mine workers and ensuring a high quality of work performed   + Worker safety is not compromised by the quantity and quality of the output of mine workers * Conduct inspections of all working areas of the surface mine including waste dumps * Resolution of complex and non-routine safety matters * Application of work health and safety management plans to the workplace * Use of explosives to the extent permitted by their shotfirer’s licence * Advise the person holding the next most senior statutory position of health and safety standards regarding the extraction of the mineral * Bring any significant deviation from those standards and practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

[***Jurisdictional note****: WA will manage surface coal mines using the surface metalliferous and extractive mine provisions*.]**I. Underground Mine Manager – All Metalliferous and extractive underground mines (not including opal or gemstone mines with less than 5 persons)**

|  |
| --- |
| * Control and manage activity relating to the underground operation * Monitoring work practice to ensure compliance with regulations * Monitoring work practice to ensure safe working of all mine workers * Monitoring to ensure safe work practice is not compromised by quantity and quality of the output of mine workers * Resolution of complex and non-routine safety matters * Application of work health and safety management system to the mine * Advise the SSE of health and safety standards regarding the extraction of the mineral * Bring any significant deviation from those standards and practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position * Oversee the safety and other duties performed by relevant workers * Documenting any potential sources of inrush and/or inundation of the underground mine that cannot be removed or rendered harmless * Responsible for:   + Efficient ventilation of the mine   + Effective ground/strata control   + Implementation of an effective emergency plan for the underground workings   + Safe storage and use of explosives   + Performance of safe Hot work underground.   + Regular and effective inspection of the underground workings |

**J. Underground Mine Supervisor – Metalliferous and extractive underground mines (other than opal and gemstone mines with less than 5 people) (There can be more than one of these position-holders)**

|  |
| --- |
| * Inspection of working places underground each shift * Monitoring work practice to ensure compliance with regulations * Monitoring work practice to ensure safe working of all mine workers * Monitoring to ensure safe work practice is not compromised by quantity and quality of the output of mine workers * Resolution of complex and non-routine safety matters * Ensure application of work health and safety management system to the mine |

**K. Surface Mine Manager/Quarry Manager – Metalliferous and extractive surface mines (not opal and gem mines with less than 5 people)**

|  |
| --- |
| * Implementing and maintaining a high level of safety onsite while also supervising and coordinating production operations in an open cut mine or quarry * Overseeing the safe undertaking of activities and interaction of mine workers * Ensure worker safety by monitoring compliance with regulations in the allocated area of responsibility * Direct supervision of working miners to ensure their health and safety, including:   + Responsibility for safe working of mine workers and ensuring a high quality of work performed   + Worker safety is not compromised by the quantity and quality of the output of mine workers * Conduct inspections of all working area of the surface mine including waste dumps * Resolution of complex and non-routine safety matters * Application of work health and safety management plans to the workplace * Use of explosives to the extent permitted by their shotfirer’s licence * Advise the person holding the next most senior statutory position of health and safety standards regarding the extraction of the mineral * Bring any significant deviation from those standards and practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**2.** **Safety-critical functions which must be undertaken at the mine by holders of BOE-prescribed and published qualifications or competencies**

***Drafting Note: transitional arrangements are to be specified***

**A. Mine Surveyor – All mines, except opal and gemstone mines with less than 5 people**

|  |
| --- |
| * To compile, certify and verify the accuracy of plans * To consider any variations in mine working plans * To ensure mines are referenced to the Geocentric Datum of Australia and the Australian Height Datum * To ensure accurate and current plans are maintained at the mine in an appropriate format * To consider relevant high risk notifications |

**B. Fire Officer – Coal Underground**

|  |
| --- |
| * Report to the underground mine manager all deficiencies in fire fighting equipment and training * Inspect, test and maintain all fire fighting equipment * keeping records of the inspection, testing and   maintenance of fire fighting equipment   * establishing fire prevention and control training needs   and ensuring the training is carried out   * ensuring the currency of all fire fighting plans and procedures * testing, and reporting on, the condition of the mine’s communication system. |

**C. Roadway Dust sampler – Coal underground**

|  |
| --- |
| * Collect dust samples from roadways in proscribed areas of the mine and have those samples analysed to ensure compliance * report to the underground mine manager all areas of the mine where incombustible dust is not applied to satisfy proscribed standards * set up a sampling regime to satisfy legislative requirements * conduct sampling to comply with the proscribed standard * have samples analysed. |

**D. Electrical Engineering Manager – Coal Surface**

|  |
| --- |
| * Monitor the implementation of the electrical engineering management plan including reviewing and revising as necessary * Analysis, design, and maintenance of electrical systems * Selection and operation of power systems, electronics, control systems, signal processing and telecommunications systems * Advise the SSE of health and safety standards and practices for electrical engineering * Advise the SSE of health and safety and health standards regarding the electrical installations and the supply of electrical power at the mine * Bring any significant deviation from the electrical engineering standards or practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**E. Mechanical Engineering Manager – Coal Surface**

|  |
| --- |
| * Monitor the implementation of the mechanical engineering management plan, including reviewing and revising as necessary * Analysis, design, and maintenance of mechanical systems * Selection and operation of mechanically powered machinery for production purposes * Operation of machines and tools * Advise the SSE of health and safety standards and practices for mechanical engineering * Advise the SSE of health and safety and health standards regarding the mechanical installations at the mine. * Must bring any significant deviation from the mechanical engineering standards or practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**F. Electrical Supervisor – All Metalliferous and extractive mines (not including opal or gemstone mines with fewer than 5 persons)**

|  |
| --- |
| * Maintain the records of electrical work and installation at the mines * Monitor the implementation of the electrical engineering management plan including reviewing and revising as necessary * Analysis, design, and maintenance of electrical systems * Selection and operation of power systems, electronics, control systems, signal processing and telecommunications systems. * Advise the mine operator of health and safety standards and practices for electrical engineering. * Must advise the SSE of health and safety and health standards regarding the electrical installations and the supply of electrical power at the mine. * Must bring any significant deviation from the electrical engineering standards or practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**G. Mechanical Supervisor – All Metalliferous and extractive mines (not including opal or gemstone mines with fewer than 5 persons)**

|  |
| --- |
| * Maintain the records of mechanical work and equipment at the mine. * Monitor the implementation of the mechanical engineering management plan, including reviewing and revising as necessary * Analysis, design, and maintenance of mechanical systems * Selection and operation of mechanically powered machinery for production purposes * Operation of machines and tools * Must advise the mine operator of health and safety standards and practices for mechanical engineering * Must advise the SSE of health and safety and health standards regarding the mechanical installations at the mine. * Must bring any significant deviation from the mechanical engineering standards or practices and any risks to health and safety that they become aware of to the attention of the next more senior statutory position. |

**3. Identified safety roles and functions which if required to be undertaken at the mine must be undertaken by a person with specified qualifications or competencies set by the BOE.**

**Shot Firer:** applicable in all mines where explosive shots are fired.Responsible to the underground mine manager for all shotfiring activities at the mine which include, the control, management , transport, loading, firing and disposal of explosives. All persons firing shots with explosives in Australia are licensed. This may be covered in complementary legislation .

**Underground Coal**

|  |  |
| --- | --- |
| Ventilation engineer | Statutory Ventilation Officer conducts day-to-day roles but a qualified engineer may be required in larger and more complex mines to develop and oversight the Ventilation Control Plan |
| Supervisor | A supervisor may be an engineer, leading hand artisan, overseeing engineering work or a person overseeing mining technology work. They may also be specialists with contractors undertaking non routine tasks.  Those persons are employed in addition to statutory practising positions to ensure standards are met and as such must understand mining legislation and the requirements of the WHSMS |

**Surface Coal**

|  |  |
| --- | --- |
| Supervisor | A supervisor may be an engineer, leading hand artisan, overseeing engineering work or a person overseeing mining technology work. They may also be specialists with contractors undertaking non routine tasks  Those persons are employed in addition to statutory practising positions to ensure standards are met and as such must understand mining legislation and the requirements of the WHSMS. |

**Metalliferous and extractives**

|  |  |
| --- | --- |
| Radiation Safety officer | A radiation safety officer must have qualifications and experience satisfactory to the State mining engineer.   The radiation safety officer at a mine is to be responsible for advising the manager on matters relating to the implementation of the radiation management plan for the mine |
| Supervisor | * Inspection of working places each shift * Ensure worker safety by monitoring compliance with regulations * Monitor and ensure safe working of all mine workers * Worker safety is not compromised by the quantity and quality of the output of mine workers * Resolution of complex and non-routine safety matters * Ensure application of work health and safety management plans to the workplace |
| Ventilation Officer | * Assist with the development of any new ventilation control plan * Monitor the implementation of the ventilation control plan, including reviewing and revising as necessary * Ensure the provision of air of adequate quality for mine workers to breathe * Ensure the quality of the mine is measured and recorded * Ensure that ventilation systems result in the dilution of both natural and introduced (eg. diesel exhaust) gases * Ensure that ventilation systems result in the dilution or removal of dust * Ensure that ventilation systems result in the provision of optimum temperature for mine workers and machinery * Ensure all ventilation control devices at the mine are properly constructed and maintained * Take charge of any ventilation system change in the mine by giving directions, or by being present, when the change is happening * Bring any significant deviation from the ventilation standards or practices and any risks to work health and safety that they become aware of to the attention of the underground mine manager. |

# Schedule B Code of Signals

The following signals comprise the Code of Signals –

|  |  |
| --- | --- |
| **Knocks or Rings** | **What is Signified** |
| 1 | Stop — Signal to be returned by driver when the conveyance is or has been brought to rest. |
| 2 | Lower |
| 3 | Raise |
| 4 | Hoist to surface. |
| 5 | Danger signal — The conveyance should be moved until release signal 8 has been given. |
| 6 | Materials or equipment to be conveyed (cautionary signal). Signal to be returned by driver before a command signal is given when the driver should move the conveyance slowly. |
| 7 | Firing warning. |
| 8 | Release conveyance from “Danger” signal. Signal to be returned by driver before a command signal is given. |
| 12 | Accident signal — to be followed after a pause by the signal for the level where the conveyance is required. |
| 1 pause 2 pause 3 | Change to wind from a different level (throw in or out of gear). Signal should not be given while the conveyance is in motion. |

The shaft conveyance should be raised or lowered, as required, in accordance with the following signals –

***WINDING SIGNALS – CHANGE OF LEVEL***

|  |
| --- |
|  |
| 1 pause 1 To No. 1 level. | |
| 1 pause 2 To No. 2 level. | |
| 1 pause 3 To No. 3 level. | |
| 1 pause 4 To No. 4 level. | |
| 1 pause 5 To No. 5 level. | |
| 2 pause 1 To No. 6 level. | |
| 2 pause 2 To No. 7 level. | |
| 2 pause 3 To No. 8 level. | |
| 2 pause 4 To No. 9 level. | |
| 2 pause 5 To No. 10 level. | |
| 3 pause 1 To No. 11 level. | |
| 3 pause 2 To No. 12 level. | |
| 3 pause 3 To No. 13 level. | |
| 3 pause 4 To No. 14 level. | |
| 3 pause 5 To No. 15 level. | |
| 4 pause 1 To No. 16 level. | |
| 4 pause 2 To No. 17 level. | |
| 4 pause 3 To No. 18 level. | |
| 4 pause 4 To No. 19 level. | |
| 4 pause 5 To No. 20 level. | |
| 5 pause 1 To No. 21 level. | |
| 5 pause 2 To No. 22 level. | |
| 5 pause 3 To No. 23 level. | |
| 5 pause 4 To No. 24 level. | |
| 5 pause 5 To No. 25 level. | |
| 6 pause 1 To No. 26 level. | |
| 6 pause 2 To No. 27 level. | |
| 6 pause 3 To No. 28 level. | |
| 6 pause 4 To No. 29 level. | |

|  |
| --- |
| **Winding Signals – Change of level** |
| 6 pause 5 To No. 30 level. |
| 7 pause 1 To No. 31 level. |
| 7 pause 2 To No. 32 level. |
| 7 pause 3 To No. 33 level. |
| 7 pause 4 To No. 34 level. |
| 7 pause 5 To No. 35 level. |
| 8 pause 1 To No. 36 level. |
| 8 pause 2 To No. 37 level. |
| 8 pause 3 To No. 38 level. |
| 8 pause 4 To No. 39 level. |
| 8 pause 5 To No. 40 level. |

Unless preceded by the cautionary signal (6 knocks or rings), indicating that materials or equipment are to be conveyed, all signals from level to level, surface to level and level to surface, should be regarded as meaning that persons are being raised or lowered, and the engine driver should drive accordingly.

The pause between signals in the Code should be the space of time required to give 2 knocks or rings.

# Schedule C Prohibited Items

|  |  |
| --- | --- |
| **Column 1 Item** | **Column 2 Prohibited use** |
| Internal combustion engine (other than a compression ignition engine) | All uses underground. |
| Unlicensed Polymeric Chemical Products | All uses underground. |
| Compressed natural gas | In an underground mine in an internal  or external combustion engine. |
| Hydrogen | In an underground mine in an internal  or external combustion engine. |
| Liquid petroleum gas | In an underground mine in an internal  or external combustion engine |
| Petrol and Fuel | In an underground mine in an internal  or external combustion engine unless specified for use underground in a mine |
| Ignition sources (eg.cigarettes, matches,lighters, naked flame,naked light) |  In an underground mine.   At any mine while carrying, handling or using any explosive or initiating system.   Within 8 metres of any explosive or initiating system.   At a mine, or work area at a mine, where solvents are used.   At a mine, or work area at a mine, where flammable vapours are present.   In a shaft conveyance.   In a refuge chamber during an emergency. |
| Items containing uncoated  or unprotected aluminium  or light metal alloys |  Underground coal mines - anywhere on the inbye side of:  (a) the first cut-through outbye, a longwall face or the last line of open cut-throughs in a panel; or  (b) a distance of 100 metres outbye, a longwall face or last line of open cut-throughs in a panel, whichever is the larger area.   In an atmosphere, in any mine, containing more than 1.25% of methane |
| Explosives, detonators and exploders | Whole of mine, unless specified for the purpose of shotfiring. |
| Firearms | Whole mine. |
| Non-fire resistant and antistatic  (FRAS) products | Underground parts of a coal mine |

# Schedule D Explosion Protected Diesel Engine Systems

**Schedule of requirements for manufacturers to assess their explosion protected diesel engine systems as safe.**

The requirements for diesel engine systems that the manufacturer must assess as being met before being used in an Explosion Risk Zone 1 in an underground coal mine are:

1. All explosion protected diesel engine systems must meet the requirements of

AS 3584.2:2008 Diesel engine systems for underground coal mines, Part 2: Explosion protected and the drawing and documents specified in AS3584.1 and AS3584.2:2008 Section 5.

(2) All fire protected diesel engine systems must meet the requirements of AS 3584.1:2005 Diesel engine systems for underground coal mines, Part 1: Fire protected - Heavy Duty.

(3) All diesel engine systems must also meet the following requirements:

(ii) Gaseous emissions:

Diesel engines being introduced into the underground environment shall be type tested on an engine dynamometer in accordance with the procedures outlined in Appendix D of AS 3584.2:2003, or

Appendix D of AS 3584.1:2005 unless excluded by subpoint (iii) below

The undiluted raw exhaust gas emissions shall meet the levels specified in the table below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Raw exhaust gas limits for diesel engines operating in underground environments** | | | | |
| **Description** | **CO (ppm)** | **NO (ppm)** | **NO2 (ppm)** | **NOx (ppm)** |
| Type testing of new engines for underground coal mines without methane injection (see note 2 below) | 1,100  (0.11%) | 900 (0.09%) | 100 (o.o1%) | - |
| Type testing of new engines for underground coal mines with methane injection (see note 2 below) | 2,000 | 900 | 100 | 1,000 |
| In-service engines in underground coal mines (see note 1) | 1,100 | 900 | 100 | 1,000 |
| Engines in other underground environment | 1,100 | 900 | 100 | 1,000 |

Notes:

1. based on the non-core legislation

2. Refer to AS 3584.1 and AS 3584.2

Exhaust emissions testing shall be carried out by a licensed laboratory unrelated to the diesel engine or plant designer and/or manufacturer.

(ii) Diesel engine particulate signature (Q DP(min))

The minimum ventilation quantity (QDP(min)) to dilute diesel particulate exhaust emissions to

0.1 mg/m3 EC shall be:

a) Calculated in accordance with the procedures specified below for *Diesel Particulate*

*Signature* for all new diesel engines being introduced into the underground environment;

b) Calculated ***with*** and ***without*** other system(s) or device which reduce diesel particulate being

installed e.g. before and after a removable type particulate filter element;

c) Calculated on undiluted exhaust entering the mine atmosphere; and

d) Provided to the end user of the diesel engine system and kept in the plant safety file.

The minimum ventilation quantity (QDP(min)) to dilute diesel particulate exhaust emissions to

0.1 mg/m3 EC shall be calculated when the engine is loaded in accordance with the ISO 8178 duty

cycle using the engine loadings and weighting factors as specified in *Table 5* below.

The diesel particulate signature shall be calculated using the following equation:

*QDP(min)* = *ECkW /3600 DP(Exposure Limit) PWA*

Where

*QDP(min)* = minimum mine ventilation quantity (m3/s)

*DP(Exposure Limit)* = 0.1 EC (mg/m3)

*ECkW* = sum of weighted average diesel particulate (EC) per hour emitted

from the diesel engine exhaust over the specified duty cycle (mg/hr)

*PWA* = sum of weighted average power for the diesel engine over the duty

cycle (kW)

*Table 5* below provides requirements and a procedure for this calculation.

Elemental carbon (EC) concentration shall be measured in gravimetric units (mg/m3) by a licensed

laboratory using equipment specified in clause 8.2 *Diesel Particulate Monitoring Equipment*.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Speed** | **Units** | **Low idle** | | **Rated Torque Speed** | | | | | | **Rated Power Speed** | | | | | | |
| Test Number |  | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 |
| **Torque %** |  | 0% | | 100% | | 75% | | 50% | | 100% | | 75% | | 50% | | 10% |
| Torque per test number (T) | Nm | Measured values from dynamometer testing | | | | | | | | | | | | | | |
| Speed per test number (n) | Spm | Measured values from dynamometer testing | | | | | | | | | | | | | | |
| Power per test number (Pun) | Kw | = torque x rpm 2 2n/60,000 | | | | | | | | | | | | | | |
| **Exhaust volumes** |  |  | | | | | | | | | | | | | | |
| Engine nominal intake air flow per test number (q1) | l/s | As calculated (1), or measured at testing. Include turbo boost | | | | | | | | | | | | | | |
| Engine nominal intake air flow per test number (Q1) | m3/hr | = l/s x 3.6 | | | | | | | | | | | | | | |
| Engine nominal flow rate adjusted to ISA2 (Q2) | m3/hr | Usng Gas equation 3 Q2 = Q1 x (P1/T1) x (T2/P2) | | | | | | | | | | | | | | |
| **Particulate concentration (as EC)** |  |  | | | | | | | | | | | | | | |
| EC concentration per test number (ECven) | Mg/m3 | Using measured EC from licensed labouratory | | | | | | | | | | | | | | |
| Total EC per hour per test number (EC??) | m3/hr | Nominal adjusted flow rate (Q2) x EC concentration above (ECven) | | | | | | | | | | | | | | |
| **Weighted Results** |  |  | | | | | | | | | | | | | | |
| **Weighted factor** |  | 0.15 | 0.1 | | 0.1 | | 0.1 | | 0.15 | | 0.15 | | 0.15 | | 0.1 | |
| Weighted EC per hour per test number (ECconwql) | mg/hr | = using results above (EC???) x weighting factor  = using results above (P??) x weighting factor | | | | | | | | | | | | | | |
| Weighted power per test number (Pconwql) | kW |
| **Sum of weighted results** |  |  | | | | | | | | | | | | | | |
| Sum of weighted EC per hour (ECkw) | mg/hr | = sum of weighted EC results above Σ(EC???)  = sum of weighted power results above Σ(P???)  = sum of weighted average EC (ECkw)/ sum of weighted average pwer (Pkw) | | | | | | | | | | | | | | |
| Sum of weighted power (Pwa) | kW |
| Average EC per KW per hour (ECkwn) | mg/kW/hr |
| Minimum ventilation per kW (Q ventKW) | m3/s/kW | = EC KWH / (3600 x DP exposure limit) | | | | | | | | | | | | | | |
| **Minimum mine ventilation quantity Q DP(min)** | **m3/s** | **= minimum mine ventilation per kW (QventKW) x (PKW)** | | | | | | | | | | | | | | |
| Note – These calculations should be carried out before and after the particulate reduction device | | | | | | | | | | | | | | | | |

Diesel particulate emissions testing shall be carried out by a licensed laboratory using one of the

instruments listed below, as they are considered appropriate for the analysis of diesel particulate in the raw exhausts of engines:

a) Air Quality Technologies Diesel Particulate Monitoring System Model LLSP-M-03 series

instruments. The instrument should be calibrated to read raw exhaust EC directly.

b) The Rupprecht & Patashnick Co Inc Series 5100 Elemental Carbon Analyser.

c) The collection of diesel particulate matter on a quartz filter and subsequent analysis by NIOSH

Method 5040 (NIOSH 2003).

Each instrument must be calibrated in accordance with the manufacturer’s recommendations.

**(iii) Engine Dynamometer Testing**

Engine dynamometer testing as specified in point (i) and (ii) above is not required if the diesel engine complies with the American EPA Tier II or European EPA Stage 2 emission standards or greater and the following requirements are met:

a) The original diesel engine manufacturer provides certification stating the EPA compliance and this certificate identifies:

i) the exhaust emission levels obtained over the test cycle, and

ii) the conditions and parameter under which the diesel engine must be operated for this certification to remain valid.

b) The diesel engine is installed in the plant in accordance with the EPA certification conditions and parameters.

c) A copy of the EPA certification is maintained in the diesel engine plant safety file.

d) A licensed laboratory confirms that results obtained during baseline testing concur with the EPA certification.

(b) for all non-flameproof (fire protected) diesel engine systems, a fire risk assessment must be carried out and a fire protection system must be installed in accordance with the requirements of AS 5062:2006 Fire protection of mobile and transportable equipment.

(c) Any new diesel engines designed for and being introduced into the underground environment shall be designed to minimise diesel pollutants as far as reasonably practicable.

# Schedule E Criteria for the Assessment of Drugs

### 1 PURPOSE

The purpose of this standard is to provide a default regime to be adopted by mine operators in the event that the mine operator and mine workers cannot agree on a drug testing regime. The standard provides guidance on matters required for a workplace regime for the assessment of mine workers for improper use of drugs at a mine under mine safety legislation.

2 SCOPE

* This standard is for coal mines where agreement has not been achieved with a majority of workers at a mine on the criteria for assessment to decide a person's fitness for work by –

##### Random testing before starting, or during work;

##### Testing a person if someone else reasonably suspects the person's ability to carry out the person's duties at the mine is impaired because the person is under the influence of drugs.

* The standard does not imply or suggest actions that should be taken in the event of evidence being found that indicates a person at the mine may be under the influence of drugs to a level that may cause an unacceptable level of risk at a mine site.

3 APPLICATION FRAMEWORK

All mines are required to have a safety and health management system for controlling risks associated with drug use by persons at a mine. The safety and health management system affects all persons at a mine including workers and visitors.

This standard applies to workers and visitors at mines where the majority of workers at the mine have not agreed on the criteria for the assessment of a person's fitness for work as required under section 42(7) of the Coal Mining Safety and Health Regulation 2001.

This standard has the objective of putting in place a system that can assess the level of drugs in a person that may result in an unacceptable level of risk to the person or others at the mine.

*In the event of an incident or accident at a mine, the results of any assessment for the presence of drugs in a person associated with the incident should not be disclosed to the investigators of the incident or accident until after the preliminary investigation is completed.*

4 TECHNICAL GUIDANCE

**A. Criteria for assessment**

The following body fluids can be used to test mine workers for the presence of drugs or their metabolites:

### Urine;

### Oral fluid (saliva); and

### Blood.

Oral fluid is defined in AS 4760 - 2006 as "Secretions in the oral cavity emanating predominately from the major and accessory salivary glands". Saliva and oral fluid can be taken as the same.

**Urine testing**

Urine testing should be conducted in accordance with AS/NZS 4308:2001*- Procedures for the collection, detection and quantitation of drugs of abuse in urine.* Results of urine tests may be usedto identify persons who have used drugs and who may therefore, reasonably be expected to beaffected by drugs while at work.

**Oral fluid testing**

Oral fluid testing should be conducted to similar standards currently used by the Queensland

Police Service (QPS) for the detection of drug affected drivers in Queensland, or to AS 4760 -

2006: *Procedures for specimen collection and the detection and quantitation of drugs in oral fluid*.

These involve an oral fluid drug screening test that can detect the presence of a class of drugs (e.g. amphetamines) in a person. AS 4760 refers to this as "on-site initial testing".

If the result of the on-site initial test is positive and is disputed by the individual being tested, or is otherwise required to be confirmed, the original sample may be split or a second sample collected for confirmation analysis. Following appropriate chain of custody protocols for this confirmation sample, analysis should be undertaken by an appropriate laboratory to confirm (or not) the presence of a drug in the sample taken at the time of the on-site initial testing.

**Blood analysis**

Where a person is unable to supply an oral fluid or urine specimen and is hospitalised following an accident / incident, the person should be requested to supply a blood sample for analysis. Signed consent must be given before the sample is taken.

*Note: Not all accidents / incidents would need persons to be tested for the presence of drugs.*

*Accidents such as those in which persons have been injured by falls of strata or incidents where mechanical failure has occurred, may be excluded.*

**B. Assessment process where agreement has not been reached**

**Type of test When test to be applied.**

|  |  |
| --- | --- |
| **Type of test** | **When test to be applied** |
| **Urine test** | Before the worker first commences work at the mine. To confirm if a person  is at a higher risk classification due to evidence of drug usage. |
| **Oral fluid – on-site initial test** | 1. Random testing   * *Pre-shift, post-shift and during shift testing of persons whilst on the mine site to ensure no improper use of drugs.*   2*.* After an accident / incident at the mine   * *Testing of all persons associated with the incident / accident as defined by the mine's safety and health management system.*   3. On suspicion   * *Where there is reasonable concern regarding an individual's fitness for duty*   4*.* Following a positive drug test result   * *On return to work.* |
| **Oral fluid laboratory confirmation as per AS 4760-2006** | If the on site initial test is positive and the result is disputed and/or a confirmation test is requested by the individual or is otherwise required. |
| **Blood test** | Hospitalisation following an incident  *Unless a person has already been subjected to an oral fluid on-site initial test, or has provided a urine sample, prior to leaving the mine.* |

5 ACCOUNTABILITIES / COMPETENCIES

The safety management system must identify the competencies, accountabilities and appointments of persons conducting the assessment process. Numerous persons, each with limited specialised skills, may be co-ordinated to provide a competent assessment regime. One of the important functions of the safety management system will be to ensure that persons performing the assessments at the mine site maintain their competency.

6 DEFINITIONS

As per the *Coal Mining Safety and Health Act 1999* and the *Coal Mining Safety and Health Regulation 2001:-*

**Drugs:** Any substance which, when taken into the body, alters its function physically and/or psychologically, excluding food, water and oxygen. (*World Health Organisation*)

**Random:** Means testing can be done anywhere at any time on a mine site.

7 INFORMATIVE STANDARD

AS 4760 - 2006: *Procedures for specimen collection and the detection and quantitation of drugs in*

*oral fluid.*

FLOWCHART – TESTING SEQUENCE (expert pre-employment)

Random Testing

Return to work

Concern re worker’s fitness for duty

Laboratory analysis

Blood sample (consent required)\*

Workers requiring hospital treatment (on site initial test not performed by drug testing indicated

Return to work after positive drug test

Incident/accident testing of persons associated with incident

Site policy

Laboratory oral fluid confirmation tests

Oral fluid on site initial test

Negative

Positive

Positive – not disputed

Negative

Negative

Negative

Positive – disputed or confirmation otherwise required

Optional

Blood sample/s should be taken within 2 hours of the incident

# Schedule F **Content for National Data Set**

1 The National Mine Safety Database should contain National Data Set information. The following definitions should be captured in the Code for the National Data Set:

**Definitions**

|  |  |
| --- | --- |
| *Classification* | means the coding assigned to an occurrence of a serious accident or a disease by the Types of Occurrence Classification System (TOOCS) published by the National Occupational Health and Safety Committee (NOHSC), as in force from time to time. |
| *Employment Arrangement* | means the mode of employment of a person. |
| *Incident* | includes injuries, occupational diseases and high potential incidents that occur at the mine. |
| *Industry* | means the industry code specified in Australian and New Zealand Standard Industrial Classification, as in force from time to time. |
| *National Data Set* | means the information provided by a Mine Operator contained within a report of an incident set out at clause 10 and the information provided by the Mine Operator in each Recording Period in accordance with clause 10. |
| *National Mine Safety Database* | means the repository which houses the National Data Set. |
| *Occupation* | means a person’s occupation as classified by the Australian and New Zealand Standard Industrial Classification, as in force from time to time. |
| *Recording Period* | means a calendar quarter with quarter end dates of March 31, June 30, September 30 and December 31. |

2 The Mine Operator’s report of an incident must be required to contain the following:

### the name of the Mine Owner;

* + 1. the name of the Mine Operator;
    2. the name of the employer of the injured person or, where the injured person is self employed, the name of the persons’ business or undertaking;
    3. the main Industry of the persons employer;
    4. the location of the mine;
    5. an indication of whether the incident has resulted, or is likely to result in:
       1. fatality;
       2. permanent incapacity;
       3. a lost-time injury;
       4. restricted or alternative duties
       5. medical treatment; or
       6. the potential for fatality, permanent incapacity, a lost-time injury or medical treatment;
    6. the name of the person or persons injured;
    7. the sex of each injured person;
    8. the date of birth of each injured person;
    9. the injured person or persons shift start time, shift finish time, and number of hours worked prior to the incident;
    10. the person or persons Occupation;
    11. the date of the incident or the date on which the occurrence of the occupational disease was first reported to the Mine Operator;
    12. the time at which the incident occurred;
    13. a description of the incident or the circumstance leading to the occupational disease which details:
        1. what the injured person or persons were doing at the time of the disease exposure or just before the occurrence of the incident;
        2. a description of any particular substance, product, process or equipment involved in the incident;
        3. how the injury was sustained;
    14. a Classification (as defined) of:
        1. the mechanism of the incident and the agency of the injury;
        2. the bodily location of the injury or disease;
        3. the nature of the injury or disease; and
    15. the Employment Arrangements (as defined) of the person or persons at the time of the incident.

3 The Mine Operator must also be required, in each Recording Period (as defined), to report to the regulator:

### the commodity produced at the mine;

* + 1. the number of people who worked at the mine in the Recording Period;
    2. the total number of hours worked at the mine in the Recording Period;
    3. for each incident at the mine during the Recording Period which resulted in a fatality, lost time, medical treatment or restricted duties;
    4. the total number of days lost from work as a result of an incident during the Recording Period;
    5. the total number of days spent on restricted duties in the Recording Period;
    6. the total number of incidents during the Recording Period which occurred that resulted in lost time or an inability of a person to work for a day or longer;
    7. the number of persons who were placed on restricted duties as a result of an incident during the Recording Period;
    8. the number of medical treatment injuries in the Recording Period which did not result in a lost time injury; and
    9. the number of fatalities that occurred in the Recording Period.

# Schedule G Heat Stress

This schedule is to be used by the mine operator for the purposes of developing the mines’ Health Control Plan.

1 INTRODUCTION

The purpose of this standard is to assist coal mine workers understand the risk factors in working in heat, where this may occur in a mine, recognise the symptoms and to ensure that any necessary control measures are understood the implemented.

Heat factors that may impact on the underground environment include:

* temperature and humidity (moisture content) of the intake ventilating air from surface;
* temperature rise due to auto compression in adiabatic conditions (approx. 1°C and 0.4°C per 100m of depth increase for dry bulb and wet bulb temperatures respectively);
* heat exchange with strata and groundwater;
* heat exchange with casual water, sumps drains etc.;
* radiant heat emitted from equipment & machinery;
* radiant heat from waste areas (seals, open goaf);
* radiant heat from oxidation of coal

It is fundamental that all persons who go underground should know that in hot working conditions, high sweat rates, with excessive loss of body fluids may result in dehydration and electrolyte imbalance. It is well established that dehydration and / or electrolyte disturbances will impair both mental and physical work performance and if prolonged or severe can pose a serious risk to health.

A key issue is whether work is “paced” or “self-paced”. In self-paced work, the person recognises, for example, that they are over-heating or concentration is being affected (cognitive decay) and adjusts accordingly. Any underground task that is not self-paced needs special attention. Paced work can include persons working in teams or persons working to deadlines (including self-imposed ones).

Heat stress may result from elevated temperatures and humidity in the environment, the rate of work and a person’s physical condition. For normal body function, heat exchange between the body and the environment needs to be balanced and relies on metabolic heat being dissipated to the environment through convection, radiation and evaporative heat transfer. Individual factors that increase the risk of heat stress are many, and may include:

* dehydration
* non-acclimatisation
* poor physical fitness
* overweight / obesity
* fatigue
* sleep deprivation, and
* skin disease
* illness & medical conditions

Fitness for duty, especially the issues of persons who are prone to, or develop, risk factors that significantly elevate their risk of developing heat illness when working in heat. This does not relate to BMI but may be related to VO2 levels.

The intent of the individual factors mentioned above are merely guidelines and are not to be construed as a trigger for a requirement for individuals to have medicals.

Both management and the workforce must recognise that most worker in an adverse environment in a mine cannot take easy refuge from the conditions by opening a door and going outside, as in most other industries. The effects of heat illness must not be taken lightly, and steps must be taken to minimise the impact of the work environment, and to promote safe working practices within it.

2 SCOPE

This Standard is applicable to underground coal operations where it is identified that temperatures in an underground operation may exceed 27° C wet bulb temperature.

3 DEFINITIONS

|  |  |
| --- | --- |
| **ACCLIMATISATION** | The physiological adaptation of the human body to increased heat stress through increasing the storage of fluid in the bloodstream (plasma). Acclimatisation results in an increased tolerance to dehydration through increased circulatory volume and increased ability for the body to produce more sweat and produce sweat sooner, thus a higher physiological tolerance of the body to heat stress. |
| **DRY BULB (DB) THERMOMETER** | Used to obtain air ambient temperature. It should be shielded from radiation without restricting airflow around the bulb. |
| **EFFECTIVE TEMPERATURE (ET)** | A heat stress index based on subjective thermal sensation. The index takes account of DB temperature, WB temperature, and air velocity. |
| **HEAT ILLNESS** | Debilitating conditions brought on by exposure to heat stress and including skin disorders, heat syncope, heat exhaustion, heat stroke, neurological disorders (i.e. nausea, loss of coordination, lethargy, concentration lapses) and dehydration. |
| **HEAT STRAIN** | The psychological response to heat stress that may or may not result in heat illness. |
| **HEAT STRESS** | The sum of environmental and metabolic heat loads on the body. |
| **HEAT STRESS INDEX** | The index eligible for selection for use in the sites safety and health management system that must be a recognised index that is technically documented. Eligible indices include:   * Effective Temperature (ET) * Corrected Effective Temperature (CET) * Air Cooling Power (ACP) * Thermal Work Load (TWL) |
| **HEAT STROKE** | A life threatening advanced state of heat illness characterised by a failure of the body’s thermo-regulatory system.  This is more severe and may be life threatening. A person may become irritable, confused and apathetic before a life threatening stage is reached. The person may also have fits. The body temperature is high (over 40°C) and the skin may be hot and dry. Heat stroke can occur if treatment is not given immediately.  Any increase in body core temperature beyond that point is life threatening and must be treated accordingly. |
| **WET BULB (WB) THERMOMETER** | Used to obtain air moisture content. The natural wet-bulb temperature is obtained by wetted sensor which is exposed to natural air movement and unshielded from radiation. |

4 THE HAZARDS OF WORKING IN HEAT

## 4.1 IDENTIFICATION OF THE HAZARDS

There is little risk of heat causing harm when heat is directly caused by the weather only (with coal mine workers wearing appropriate clothing with a low or moderate activity rate). Heat is likely to be a hazard if, in addition to the weather (or sometimes on its own), the work process has:

* High radiant heat;
* High humidity;
* A high work rate (metabolic load);
* A person wearing clothing (such as protective clothing) that means they cannot lose heat to the environment.

Any work with these four factors should be noted as a hazard.

There are a number of tools you can use to assess the heat hazard to determine if it is significant. These include:

* Visual assessment. Simply being in the area in question for a few minutes can tell you much.
* Measuring the environment with a heat stress monitor (wet bulb thermometer).
* Direct physiological measurements such as core body temperature and heart rate

## 4.2 ASSESSING THE HEAT RISK

Several factors can influence the heat load on the body. These include:

* air temperature (WB and DB);
* radiant heat exchange;
* humidity;
* air movement;
* the level of physical work; and
* the amount and type of clothing being worn.

Thick, multiple-layered or impervious clothing particularly impede heat loss, and can cause additional risk especially during physically demanding tasks. Using PPE such as respiratory protection may also affect a person’s tolerance to hot environments. It is not possible to estimate the strain placed on the body by examining any one of these factors in isolation. Instead a number of heat stress indices have been developed which integrate these variables and give a single value that represents the amount of heat risk in a given situation.

In the mining industry, Effective Temperature (ET) is the most frequently used and widely accepted index of heat stress. ET is straightforward and easy to use and takes WB temperature, DB temperature and air velocity into account. It is important to consider all these factors – eg a good air movement over the body has a cooling effect through increasing the bodies radiant heat exchange with the surrounding air and increasing the bodies capacity for evaporating perspiration, whereas high relative humidity will reduce the body’s evaporative capacity and thus its ability to lose heat by sweating. Although ET can be calculated, it is more easily derived by use of a nomogram, reproduced in Appendix I.

Mines need to carry out heat surveys to determine the areas of the mine that could give rise to potential problems, so remedial measures can be properly targeted.

## 4.3 CONTROLLING THE HAZARDS

Where possible, work activities carrying an increased risk of heat illness should be avoided is possible, however, there are times when there is no alternative to working in hot conditions, and these circumstances require special consideration. Risk analysis should be conducted, safe systems of work designed and appropriate control measures introduced to control the duration and extent of exposure. A strategy needs to be introduced to reduce the hazard through controls such as mine design, work design and equipment selection. Measures should follow the hierarchy of control.

The sites Safety and Health Management System must address the following issues, where relevant, according to the results of risk assessment:

### Safe Environment

|  |  |
| --- | --- |
| ***Ventilation*** | * Minimum standards of temperature and airflow, including accuracy of measuring instruments, measurement locations and frequency and duration of measurement. * Mine Heat loads, both fixed sources (such as conveyor drives) and moving sources (such as diesel equipment). * Climatic (seasonal) and daily variations in temperature must be considered, as well as the natural radiant heat emitted from the strata. * Machinery selection (fixed and mobile plant), including impact of equipment selection on both heat (temperature) and moisture (humidity) increases in the general ventilating air, in the workplace and at the machine operator. * Airflow layout, including choice of development and coal extraction methods and ventilation methods for the overall mine and individual districts. |
|  |  |
| ***Engineering Control of the Environment*** | * Air velocity over the skin where the person is working. * Wet bulb and dry bulb temperatures where the person is working, including accuracy of measuring instruments, measurement locations and frequency and duration of measurement. * Humidity, which reflects the difference between the dry and wet bulb temperatures and is a key factor in whether sweat evaporates from the skin or drips and therefore is a measure of how “efficient” sweating is in the particular workplace. * Microclimate cooling which includes air-conditioned cabins, “cold” vests and other means to cool the environment in the immediate vicinity of the person. * Air conditioning including either microclimate refrigerative air-conditioned cabins, chilled service water, or “bulk” air cooling of the intake air to the entire mine or to a particular district. * Removal of casual water – whilst this does not directly reduce the wet bulb temperature in the area, it does help maintain a lower humidity and reduces the flow of heat from the strata into the air. * Chilled service water, which is particularly effective in workplaces that use water continuously. * Provision and location of services and rest and recovery areas, which helps to reduce the impact of working in heat by allowing personnel to cool down during rest pauses, to eat meals when less thermally stressed, and to have ready access to cool, palatable, drinking water. |
|  |  |
| ***Location and Use of Equipment*** | * The location of static equipment that generates heat should be considered prior to installation; * Optimisation of the running time of mobile equipment will give obvious safety benefits (e.g. machines should not be left idling unnecessarily); * Equipment should also be selected for the duty to be performed |
|  |  |
| ***Control of Water to Minimise Humidity*** | * Where possible, elimination of standing water and the amount of water that is introduced underground. Obvious water sources include leaks, spillages, flushing pipes during extensions/retractions, excessive sprays, machine cooling water, and natural strata water. * Allowing water to accumulate into puddles will also increase the humidity of the passing air, so that should also be avoided. Any spillage should be collected and removed through pipes. * Suitable pump ranges should be maintained, at least to strategic locations where they can be accessed if and when required. * If operations are planned that will generate spilled water eg washing down mobile plant, the planning of the work should also address water management. |

### *Safe Systems of Work*

|  |  |
| --- | --- |
| ***Health and Safety*** | * Acclimatisation: the need for extra caution in the first week back at work after not being exposed to thermal stress for more than about 14 days should be taken. Some mines may need a formal acclimatisation protocol. * There is a requirement to develop a hydration protocol. * Fitness for duty, especially the issues of persons who have, or develop, risk factors that significantly elevate their risk of developing heat illness when working in heat. This relates to both BMI (whether in normal ranges or overweight) and to an individuals fitness levels. * Monitoring of the people in the workplace. Some operations may need a formal biomonitoring program for those working in heat. * Medical treatment, including provision of competent medical treatment both on and off the mine site. * Skin disorders, particularly Prickly Heat (Miliaria Rubra), but also complications such as irritant dermatitis, fungal infections and secondary infections. * Ear infections, including the impact of choice of hearing protection on ear infections. |
|  |  |
| ***Heat Stress Index*** | The Safety and Health Management System must specify the criteria for the selection of the Heat Stress Index used at the mine. The selected index must be suited to the identified risks of heat in the workplaces at the mine and specify the trigger levels and protocols that apply.  The selected index must be a recognised and technically documented index.  Examples of indices documented in literature are contained in:   * “Thermal Standards and Measurement Techniques” by Ramsey and Beshir. (under the heading “Evaluating the Hot Workplace: An Example” pp683) * “Subsurface Ventilation and Environmental Engineering” by McPherson. * “Thermal Work Load as an index of thermal stress” by Brake Bates & Matthew. * “Heat Stress Standard & Documentation Developed for use in the Australian Environment” by Di Corleto, Coles and Firth. |
|  |  |
| ***Job Design & Work Planning*** | * Decrease the work rate, in terms of metabolic heat production, by use of labour-saving devices, by adoption of less physical work methods and by reducing the amount of “overhead” work. * Work rate issues, particularly ensuring individual workers have the ability to regulate their work rate to avoid over-heating. * Work scheduling and exposure control. Scheduling work for cooler periods of the day or year (if applicable) or providing for job rotation and/or regular rest periods (where practicable). * Mechanisations, to either decrease the work rate (see above) or reduce the exposure of the worker to thermal stress (eg. by installing local air movers or fans to increase air velocity over the skin). * Clothing and personal protective equipment (PPE), to ensure that clothing, including underwear, is vapour permeable (cotton) and that all PPE take the impact of heat stress on the worker into account. * Methods of work to decrease the metabolic rate or reduce the exposure. * Mining method, to reduce the metabolic load, to reduce the temperatures in the workplace, or increase the local airflows over the skin. |
|  |  |
| ***Pacing Work & Adequate Hydration*** | The concepts of self-paced work and adequate hydration are fundamental issues in the management of heat stress by individuals and mine management, and the Plan must provide for persons to be properly hydrated through: -   * Provision of a supply of sufficient cool, potable water in line with the hydration protocol; * Provision of close access to (on the job) cool, palatable water; * Appropriate hydration testing and response actions; and * Ensuring that persons do not start work without being properly hydrated, and maintain their hydration during the shift   With pacing and self-pacing, the need for additional monitoring is required as the thermal stress increases, and the need arises to watch for signs of heat illness in others. Where work is externally paced, strict controls are required to ensure coal mine workers are not put under excessive thermal stress without the ability to respond appropriately and avoid heat illness. |
|  |  |
| ***Training and Education*** | Training and education is of great importance, and this includes coal mine workers and those expected to provide treatment. Training must cover the following:   * Precautions to be taken; * Behaviours to adopt * Recognition of signs, symptoms and treatment of heat illness.   The recognition of symptoms is of particular importance for lone workers, who will usually have to self-diagnose. If lone working is necessary, a system of welfare checks over and above normal supervision should be put in place. |
|  |  |
| ***Emergency Response*** | * Emergency first aid treatment of heat affected persons, as well as appropriate off-site medical treatment. * Heat management during escape and rescue, including choice of appropriate self-rescuers, location and type of egress routes, and design of refuge chambers. |

### *Safe Behaviours*

|  |  |
| --- | --- |
| ***Prior to Work*** | To minimise the effects of heat, coal mine workers need to present themselves for work in good condition. This may include:   * maintaining a healthy diet; * ensuring a good quality rest period prior to attending work; * eating prior to attending work, as this aids hydration. Bread, cereal bars, bananas, yoghurts, beans and fruitcake are all recommended; * keeping alcohol intake within national guidelines and avoiding drinking alcohol 8-12 hours before the start of the shift; * avoiding taking strenuous exercise immediately before or after the shift; * avoiding taking caffeine before the shift i.e. coffee, tea, cola or certain energy drinks; * increasing fluid intake prior to the start of the shift by drinking non-caffeine based drinks i.e. water, milk, etc… to ensure proper hydration. It should be noted that the lighter the colour of the urine (e.g. clear to light straw colour), the better the level of hydration; * informing relevant personnel if on regular medication (whether taken before or during shift) or if suffering from a medical condition as these may impact on ones hydration, circulation or sweating capacity and may affect their ability to regulate body temperature thus increasing their susceptibility to heat stress. |
|  |  |
| ***During Work*** | Behaviours to adopt during the shift to minimise risk may include:   * Wearing clothes that allow sweat to evaporate. * Pacing work. It has been found that frequent, short breaks give more benefit than occasional, long breaks from manual effort. * Job rotation. In addition to pacing work, if the more arduous tasks can be shared, no one member of the team is put at additional risk. * Regular drinking to maintain an adequate hydration level. A potential sweat loss of one litre per hour has to be replaced, and it is recommended that regular, small drinks are taken rather than fewer, large drinks, which can cause cramps. * Salt should NOT be added to the water, as this is likely to interfere with the kidneys’ normal physiological control mechanisms. Water can be made more palatable by the addition of fruit flavourings. * Avoiding drinks containing caffeine, such as tea, coffee, colas and some ‘antisleepiness’ drinks during the shift. Caffeine is a diuretic and encourages fluid loss. Similarly, energy drinks should be taken in moderation, as excessive consumption can result in a salt, particularly potassium, imbalance. * Monitoring hydration levels. This can be simply accomplished by observing the colour of the urine stream: the darker the colour, the less hydrated the individual. If this is noted, then immediate remedial action in the form of taking on extra fluids can be initiated. Urine colour charts for objective comparison are available and their use is encouraged. * Regular food intake. Like water intake, small meals should be taken at regular intervals throughout the shift, rather than waiting until mid shift to start eating. |

5 UNDERSTANDING HEAT ILLNESS

Working in high temperatures may not only cause heat illness and even death, but also loss of concentration leading to lowered productivity, and mistakes which can lead to accidents. Where humidity is relatively high, the hazard is increased. More heat strain is placed on a person as Wet Bulb (WB) and Dry Bulb (DB) temperatures get closer together. The absolute values of the temperatures are of less importance than the difference between them, as it is the relative humidity that causes the problem by inhibiting body cooling by the evaporation of sweat. For example, 28°C WB/45°C DB causes less heat strain than 32°C WB/36°C DB.

If the WB temperature rises above 27°C, however, then extra control measures shall be implemented.

## 5.1 SIGNS AND SYMPTOMS

During work in hot conditions, the human thermo-regulatory system tries to maintain the body core temperature at 37°C. It does this by increasing blood flow to the skin to carry heat away from the core, and by causing sweating, the evaporation of which cools the skin and hence the blood.

If this control is lost and the core temperature begins to rise, various physiological effects progressively result.

### Initial Symptoms

Initial symptoms will include:

* loss of interest in the task;
* difficulty in remaining alert; and
* the desire to seek more comfortable surroundings. Suppression of this desire may result in irritability.

These initial symptoms progress to a loss of co-ordination and dexterity, presenting significant safety and productivity implications.

### *Heat Exhaustion*

Heat exhaustion results from the failure of the blood flow to adequately remove heat. A decrease in blood volume may result from dehydration caused by an inadequate intake of fluids. Alternatively, if a combination of environmental heat stress and work rate causes an excessively fast heartbeat, then the time interval between successive contractions of the heart muscles may be insufficient to maintain an adequate supply to the heart and, as a consequence, the rate of blood flow will drop. Core body temperature may rise to 39°C.

The symptoms of heat exhaustion are:

* tiredness, thirstiness, dizziness;
* numbness or tingling in fingers and toes;
* breathlessness, palpitations, low blood pressure;
* blurred vision, headache, nausea and fainting;
* clammy skin that may be either pale or flushed.

### *Heat Stroke*

Heat Stroke is the most serious of all heat-related illnesses and may occur when the body core temperature exceeds 41°C (it may reach 45°C), and the co-ordination of the involuntary nervous system including thermal regulation is affected. Irreversible injury to the kidneys, liver and brain may occur. Heat stroke carries a high risk of fatality from cardiac or respiratory arrest, and must be treated as a medical emergency.

Some symptoms of heat stroke are similar to those of less serious heat illnesses, ie headaches, dizziness, nausea, fatigue, thirst, breathlessness and palpitations, but the onset of illness may be sudden and dramatic, and pre-existing heat exhaustion is not necessary.

Additional symptoms of heat stroke can include:

* cessation of perspiration, the skin remains hot but is dry and may adopt a blotchy and red colouration, and the lips may take on a bluish tinge;
* disorientation, which may become severe, including dilated pupils, a glassy stare and irrational aggressive behaviour;
* shivering and other uncontrolled muscular contractions;
* loss of consciousness and convulsions.

6 SYSTEM REQUIREMENTS

## 6.1 ROLES, RESPONSIBILITIES & RESOURCES

The roles, responsibilities and competencies of all coal mine workers having accountability and responsibility must be defined and assigned. This is to include

* those responsible for managing coal mine workers who work in extremes of temperature,
* the coal mine workers who work in those environments, and
* the personnel who provide medical support.

The roles and responsibilities assigned will also include external providers.

Those in the organisation with the authority and resources to improve working-in-heat problems should also have the responsibility to do so; likewise those who are in a position to identify and report problems should also do so.

Instruments for measuring parameters necessary to determine values of the Heat Stress Index selected must be designed and constructed for the relevant parameters. Such instruments must be used, maintained, and calibrated in accordance with the manufacturers recommendations.

## 6.2 TRIGGER ACTION RESPONSE PLANS

The site’s Safety and Health Management System should clearly indicate the trigger levels, how they are to be determined and what actions should be taken.

Responsibilities must be assigned to manage specific trigger actions. The establishment of trigger levels for the withdrawal of personnel provides set criteria by which mine personnel can initiate a predetermined action. These actions would result in, but not be limited to: -

* The collection of additional data to ascertain a course of action,
* The initiation of Action Response Plans,
* The withdrawal of persons to a place of safety.

Trigger levels should be: -

* measurable or observable;
* reviewed and monitored to ensure currency;
* identified by risk assessment;
* relevant to the risk being considered.
* reflective of the level of risk and the degree of response required. I.e. initiate predetermined actions;
* established after considering the results of any simulated testing,
* set to a level that recognises the time taken to initiate effective response. I.e. if an effective response will take considerable time then the trigger should be conservative and possibly involve a staged response approach;

Example:

|  |  |
| --- | --- |
| **Trigger** | **Action** |
| Effective Temperature greater than 29.4°C | * Withdraw all persons except those equipped for and permitted to rectify environmental conditions; * Develop a plan to address the elevated thermal conditions in the workplace |

## 6.3 TRAINING AND COMMUNICATION

The site’s safety and health management system must establish and maintain procedures for internal communication between various levels and functions of the mine, and the receipt, documentation and response to relevant communications to the hazards being addressed.

The training needs should be relevant to the specific hazard, and all personnel whose work may impact upon that hazard must receive appropriate training.

Training is to target coal mine workers and include such things as:

* the requirements as determined by the site’s safety and health management system;
* the importance of conformance with the system;
* the significant safety impacts, actual or potential of their work activities and the safety benefits of improved personal performance;
* their roles and responsibilities in achieving conformance with the heat management provisions of a system, including emergency preparedness and response requirements;
* the potential consequences of departure from the relevant procedures.

Training should include information about:

* the hazards they are exposed to
* recognition of the symptoms of heat illness in both themselves and others;
* any systems or control measures put in place by the employer;
* what they as individuals need to do to protect themselves from the hazard;
* measurement of environmental conditions;
* the correct type of personal protection to be worn;
* physical fitness and other personal factors;
* emergency procedures that must be followed.

The training shall include components on hydration, pacing and the working in heat protocols.

## 6.4 MONITORING AND REVIEW

The site’s safety and health management system shall provide for continuous improvement, therefore, ensuring the management of heat facilities are reviewed to ensure its continuing suitability, adequacy and effectiveness. The management review process shall ensure that the necessary information is collected to allow the mine to carry out this evaluation. This review shall be documented.

The Heat Stress Management Provision developed in the Safety Management System must at intervals and following heat related incidents be reviewed to ensure its continued suitability, adequacy and effectiveness.

## 6.5 AUDITING AND RECORD KEEPING

The site’s heat management facilities must be subjected to regular internal and external audits to maintain relevance and to ensure continuous improvement. The aim of the audit is to ensure the facilities and systems conform to planned arrangements for safety management, and has been properly implemented and maintained.

The audit program, including any schedule, should be based on the importance of the hazard concerned and the results of previous audits. In order to be comprehensive, the audit procedures must cover the audit scope, frequency and methodologies, as well as the responsibilities and requirements for conducting audits and reporting results.

The mine shall establish and maintain procedures for the identification, maintenance and disposition of records. These should include training records and the results of field monitoring, audits and reviews. Records must be legible, identifiable and traceable to the activity involved. They must be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Their retention times shall be established and recorded.

1. Requirements for managing the risks associated with the use of contractors are a critical component for effective mine safety regulation. A US study (Rousseau, D.M., Libuser, C. (1997), "Contingent work in high risk environments", *California Management Review*, Vol. 39 No.2, pp 103-23), reported that contractors represented 17% of fatalities in the US mining industry while the number of contractors as a percentage of the total workforce was only 10% at that time. While there has been limited research about the use of contractors in the mining industry in the Australian context, the NSW Mine Safety Review conducted by the Hon Neville Wran AC QC and Jan McClelland in February 2005 provided estimates that the level of contractors in the NSW mining industry was far higher than that reported in the US, with estimates varying between 20 and 30% of the total NSW mining workforce (i.e. between 3000-4500 people) (see p 35 of the Wran Report). [↑](#footnote-ref-1)
2. # *Report on Accident at Moura No. 2 Underground Mine on Sunday 7 August* *1994* – Warden’s Inquiry conducted pursuant to section 74 of *The Coal Mining Act* 1925, conducted before Mr F W Windridge, Warden and Coroner (Wardens Court of Queensland).

   [↑](#footnote-ref-2)
3. # See for example the 25 April 2006 Beaconsfield mine collapse. See the *Coronial Findings into the death of Larry Paul Knight at Beaconsfield gold mine*, prepared by Rod Chandler, Coroner, dated Thursday 26 February 2009 at Launceston in the State of Tasmania [2009 TASCD 25].

   [↑](#footnote-ref-3)
4. # See for example the Report on the Gretley Coal Mine Public Inquiry, August 1998, *Report of a formal investigation under Section 98 of the* *Coal Mines Regulation Act* 1982 by his Honour Acting Judge J.H. Staunton.

   [↑](#footnote-ref-4)
5. Consider for example the Pilbara BHP Billiton fatality which occurred when a mining dump haul truck rolled over the deceased’s vehicle on 4 September 2008. [↑](#footnote-ref-5)
6. Realising the health benefits of work <http://www.racp.edu.au/index.cfm?objectid=84C0100F-E554-2865-DFEF6FEE0666A005> The Royal Australasian College of Physicians [↑](#footnote-ref-6)
7. <http://www.comcare.gov.au/news__and__media/features_/effective_health_and_wellbeing_programsa_comcare_literature_review2> [↑](#footnote-ref-7)
8. ## ***Drafting note:*** *The need for withdrawal conditions in underground coal mines to be dealt with in emergency response plans was an issue subject to scrutiny in the Moura No 2 Warden’s Inquiry into the explosion at the Moura No. 2 mine in August 1994. The Moura No 2 Warden’s Inquiry identified that:*

   ## *“There was no protocol at Moura No. 2 for the withdrawal of persons from the mine in response to potential dangers. This left consideration of questions of withdrawal to those officials who happened to be on duty at any particular time. In the actual event the question of withdrawal was immersed in uncertainties with regard to the state of the mine and, in any case, appeared to have been left largely to the opinion of the middle ranking official who happened to be on duty. Any attempts that official made to obtain guidance from more senior management were not fruitful and, ultimately, any questions of staying out of the mine was left to the workforce. This situation is totally unacceptable.”*

   ## The Moura No 2 Warden’s Inquiry recommended that:

   ## “Mines be required to develop and implement protocols, as a statutory requirement, for the withdrawal *of persons when conditions warrant such action.”*

   [↑](#footnote-ref-8)
9. These are requirements of Article 10(d) to the *ILO Convention 176 concerning Safety and Health in Mines*. [↑](#footnote-ref-9)