

DRAFT

Code of Practice

WORK HEALTH AND SAFETY MANAGEMENT SYSTEMS IN MINING



Image on the right courtesy of New South Wales Department of Trade and Investment, Regional Infrastructure and Services



safe work australia

Work Health and Safety Management Systems in Mining

***Draft* Code of Practice**

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FOREWORD

This Code of Practice (this Code) on work health and safety management systems in mining is an approved code of practice under section 274 of the *Work Health and Safety Act* (the WHS Act).

An approved code of practice is a practical guide to achieving the standards of health, safety and welfare required under the WHS Act and the Work Health and Safety Regulations (the WHS Regulations).

A code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in the WHS Act, in relation to the subject matter of the code. Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks which may arise. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and Regulations. Courts may regard a code of practice as evidence of what is known about a hazard, risk or control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

Compliance with the WHS Act and Regulations may be achieved by following another method, such as a technical or an industry standard, if it provides an equivalent or higher standard of work health and safety than the code.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice.

This Code has been developed by Safe Work Australia in conjunction with the National Mine Safety Framework Steering Group as a model code of practice under the Council of Australian Governments' *Inter-Governmental Agreement for Regulatory and Operational Reform in Occupational Health and Safety* for adoption by the Commonwealth, state and territory governments.

A draft of this Code was released for public consultation on 15 July 2011 and was endorsed by the Select Council on Workplace Relations on [to be completed].

SCOPE AND APPLICATION

This Code provides guidance for a mine operator on how to meet the requirements of the WHS Regulations to establish and implement a work health and safety management system (WHSMS) for a mine.

What mining is covered by this Code?

This Code applies to all types of mines including quarries, sand dredging and other extractive operations and to those tourist mines where workers may be exposed to the risks associated with the principal mining hazards found in operating mines.

Who should use this Code?

You should use this Code if you are a person conducting a business or undertaking and have management or control of the workplace. This person is usually the mine holder or the mine operator. This Code can also be used by workers and their health and safety representatives.

How to use this Code

In providing guidance, the word 'should' is used in this Code to indicate a recommended course of action, while 'may' is used to indicate an optional course of action.

This Code also includes various references to provisions of the WHS Act and Regulations to provide context with legal requirements. These references are not exhaustive.

The words 'must', 'requires' or 'mandatory' indicate that these legal requirements exist, which must be complied with.

1 INTRODUCTION

1.1 Who has duties in relation to WHS management systems?

The WHS Act requires all persons conducting a business or undertaking (including the mine holder and the mine operator) to ensure, so far as is reasonably practicable, that workers and other persons are not put at risk from work carried out as part of the business or undertaking. This involves eliminating or minimising risks to health and safety so far as is reasonably practicable.

In addition, a mine operator has specific duties under the WHS Regulations including:

- develop, implement, maintain and document an effective work health and safety management system (WHSMS)
- identify all hazards and eliminate or minimise risks so far as is reasonably practicable
- identify all principal mining hazards, assess the risks and prepare management control plans for any principal mining hazard, and
- prepare an emergency plan and use it when responding to an emergency.

Managing risks

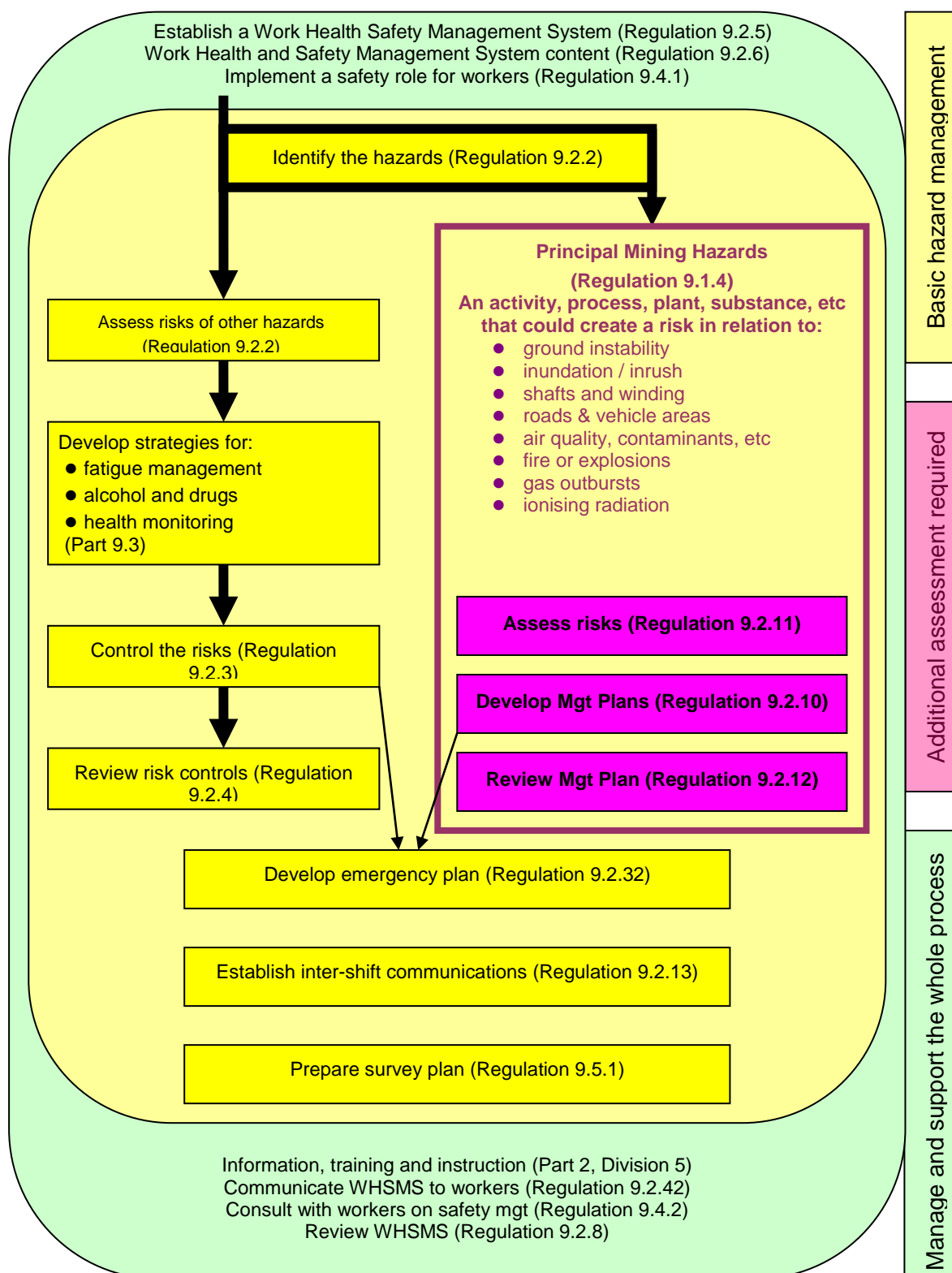
To effectively control the risks at a mine, requires the mine operator to follow a *risk management process*. This Code provides practical guidance on how a WHSMS can assist in managing and controlling the risks associated with mining operations. General guidance on the risk management process is available in the *Code of Practice: How to Manage Work Health and Safety Risks*.

Consultation

Throughout the development and implementation of the WHSMS, the mine operator must consult with their workers and other persons at the mine including other persons conducting a business or undertaking at the workplace. Further guidance on consultation, cooperation and coordination can be found in the *Code of Practice: Work Health and Safety Consultation, Co-operation and Co-ordination*.

Figure 1 shows the link between the duties detailed in the WHS Regulations and how a WHSMS is developed and implemented.

Figure 1 – WHS Regulations and WHSMS



2.1 What is a WHS management system?

A WHSMS for a mine is the primary means of ensuring the safe operation of a mine. It brings together a number of procedures and policies to ensure it is comprehensive enough to suit the risks and complexity of the mine operations.

It is a tool that enables a mine operator to follow a process that will assist them in systematically achieving and maintaining the required level of health and safety.

A WHSMS also allows the mine operator to demonstrate the management of health and safety on site:

- to other persons, in particular, contractors or other persons conducting a business or undertaking working at the mine site
- when seeking certification with an external organisation, and
- when assessing the mine systems against recognised industry standards.

The WHSMS must be documented. It must be easily understood and accessible to those who need to read it. It should be written in plain language (note that English is required for compliance but some workers may require additional translation).

2.2 Why is a WHS management system necessary?

Mining is a hazardous industry with a range of hazards and associated risks due to the dynamic and varied nature of the tasks and the environment in which they are done. The hazards can be separated into:

- principal mining hazards that have the potential to result in incidents of high consequence
- other potentially high consequence hazards but are also found in other industries
- hazards that tend to occur frequently in many work environments, and
- new or unexpected hazards that may emerge as circumstances at the mine change.

While most mines have safety-related policies, plans and processes in place, the WHSMS ties all the elements together into an integrated system to effectively manage the risks to the health and safety of all workers. It is important the operator combines all aspects of safety into a single integrated system (WHSMS) to ensure there are no gaps and that all elements work in a coordinated manner.

Managing principal mining hazards

Regulation 9.1.4 of the WHS Regulations defines a principal mining hazard as any activity, procedure, plant, structure, process, substance, situation or other circumstance that could result in multiple fatalities over time or pose a serious risk to health and safety in relation to:

- ground or strata instability
- inundation and inrush
- mine shafts and winding operations
- roads and other vehicle operating areas
- air quality, dust and other airborne contaminants
- fire or explosion
- gas outbursts, and
- ionising radiation.

Principal mining hazards are singled out for special consideration because they have specific relevance to mining activities. They also have the potential to cause an incident with

very serious consequences if not adequately controlled, even though the likelihood of it happening may be low.

As the risks associated with principal mining hazards are not always obvious, they should be managed in a systematic way. They must also be assessed both separately and in combination in case there are interactions flowing from one to the other.

A principal hazard management plan helps the mine operator manage all aspects of the risk control measures that are required. It must be documented and describe:

- the process used to identify the hazards and assess risks
- the risk control measures considered, and
- the reasons for adopting or rejecting the control measures.

Appendix A provides details on the matters that should be considered for each principal mining hazard when developing a hazard management plan.

2.3 Elements of a WHS management system

A WHSMS is the primary means of ensuring the safe operation of a mine. It must address the risks and complexity of the mine operations. A comprehensive WHSMS should include:

1. Policy - the operator's safety policy (Regulation 9.2.6(1)(a)).
2. Management - the organisational structure and contacts of those responsible for managing health and safety. It should include details of their roles and responsibilities and arrangements for persons in acting roles in the event of an emergency (Regulation 9.2.6(1)(c)).
3. Operations - the procedures that operators and supervisors need to follow to:
 - operate
 - initiate if alarm systems should activate
 - shut-down, and
 - isolate.
4. Maintenance systems - the programs and procedures that are to be followed covering preventative repair and overhaul activities (including asset integrity).
5. Hazard management process - a description of the systems, procedures and measures for managing all risks in a comprehensive and integrated manner and including:
 - hazard identification
 - risk assessment
 - selection and classification of controls
 - monitoring, maintaining and review of controls and safety systems
 - access and security
 - inspections and testing, and
 - specific principal mining hazard management plans (Regulation 9.2.6(1)(h)).
6. Emergency response plan (Division 4, Part 2) - including consulting the emergency services and local authorities, it is prepared to addresses the:
 - list of possible emergencies based on the hazards and risks assessed
 - requirements for emergency equipment, crews, first aid, transport
 - evacuation, isolating of process or work areas, and alternate exits
 - training and practices to ensure its effectiveness
 - crisis management and recovery.
7. Communication arrangements (Regulation 9.2.42) - for involving and informing workers and others including:

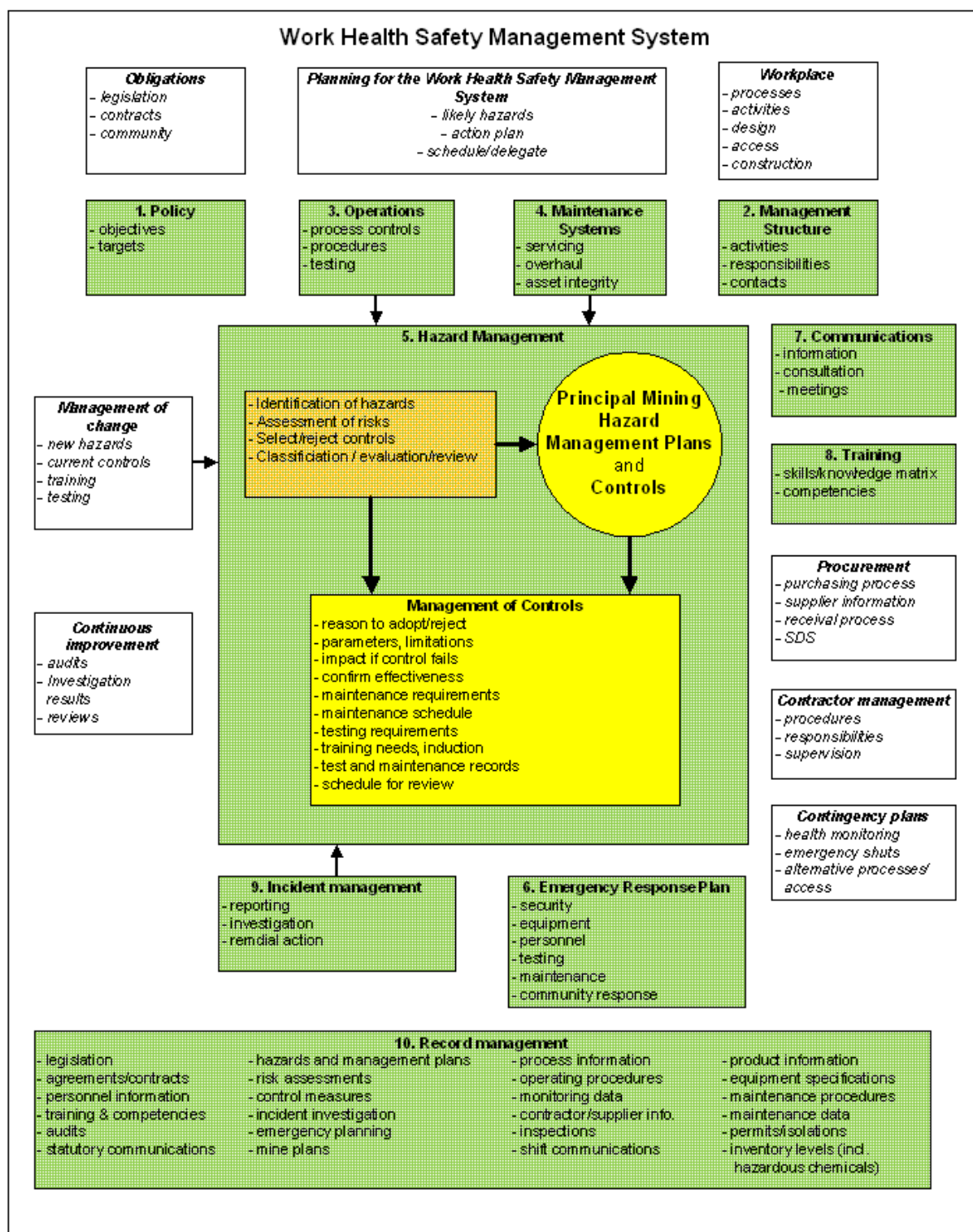
- the safety role for workers (Regulation 9.2.6(1)(f))
 - the WHSMS
 - identifying and assessing principal mining hazards and the control measures required
 - the emergency plan
 - strategies for managing risks associated with fatigue, alcohol or drugs, and
 - passing on information from one shift to another.
8. Training - with associated competence testing.
 9. Incident management - the reporting and investigation procedures as well as tracking any remedial actions to ensure they are implemented.
 10. Record management.

To be effective, a WHSMS could collate information into the following elements:

- a) an action list for the implementation of the WHSMS including delegation and schedule for implementation
- b) a description of the workplace including: processes, design criteria, access arrangements, and construction detail if new or being modified
- c) management of change system to identify any new hazards
- d) arrangements for managing and coordinating the activities of contractors and any interfaces with others working at or around the mine
- e) procurement policies and receipt process
- f) obligations under relevant legislation, agreements, contracts and community commitments/expectations
- g) continuous improvement/review (from audits, investigations, reviews) (Regulation 9.2.6(1)(g)), and
- h) contingency planning particularly for emergency shutdowns, isolating processes or work areas, actions triggered by monitoring systems such as any exposure of workers to specific health hazards (Regulation 9.2.6(1)(i)).

Figure 2 provides a diagram of the elements that should be included in a WHSMS.

Figure 2: Elements of a comprehensive WHSMS to support risk controls
 Note: Green boxes indicate the recommended elements to include in a WHSMS. The numbers and letters in the above lists correspond with the numbers and letters in section 2.3 of this Code



3 DEVELOPING A WHS MANAGEMENT SYSTEM

This chapter provides guidance on what is involved in developing an effective WHSMS.

The key steps in developing a WHSMS include a:

- work health and safety policy
- an action list to develop the WHSMS elements
- a hazard management process, particularly for principal mining hazards, and
- consultation.

Planning should include how the WHSMS will be regularly reviewed and tested in a structured way to ensure opportunities for improvement are continually identified (for example, with the introduction of new technology or changes in the workplace or activities).

The WHSMS should be written in plain language and capable of being understood by all workers (note that English is required for compliance but some workers may require additional translation).

Appendix B provides references to other relevant documents that will assist the mine operator to develop a WHSMS.

3.1 How much detail is required in a WHSMS?

A WHSMS is a comprehensive tool that enables a mine operator to follow a process that will systematically achieve and maintain the required level of work health and safety.

The level of detail in a WHSMS, and the extent of documentation and resources needed to develop, implement and maintain it, will depend on the risks and complexity of a mine and the nature of its activities.

The WHSMS must be sufficient to ensure the mine's health and safety policy can be achieved by following the processes it documents. The WHSMS should detail how targets are to be met and who is responsible for ensuring the WHSMS is implemented and maintained.

What if some systems already exist?

Many mines already have a series of policies, plans and processes to manage their health and safety obligations (for example, training, maintenance, traffic management plan, job safety assessments and security procedures). A WHSMS brings these parts together and links them in an orderly way.

What is adequate for less complex mines?

Such mines may manage their hazards with a document that is less complex than one that is required for a larger mine but contains the key elements of a WHSMS. Depending on the risks and complexity of a mine and the nature of its activities, such a plan should at least include the elements in the coloured panels of **Figure 2**, namely:

- | | |
|------------------------|---|
| • Policy | • Emergency plan |
| • Operating procedures | • Management structure and responsibilities |
| • Maintenance programs | • Training and competence |
| • Hazard management | • Communications |
| • Incident management | • Record management |

These elements will cover the WHS Regulations which mandate:

- safety policy
- hazard management
- any principal mining hazard management plans
- an emergency plan (coordinated with local authorities)

- consulting with, and implementing, a safety role for workers
- strategies for managing fatigue, alcohol or drugs
- monitoring any specific health hazards
- training and competence, and
- records management.

3.2 Consultation

Section 48 of the WHS Act requires the mine operators as a person conducting a business or undertaking to consult with workers that are likely to be affected by a work health and safety matter.

Workers should be involved in:

- helping identify the hazards
- assessing the risks
- selecting the control measures to be implemented
- changes to work that may affect their safety or health
- procedures for consulting and resolving issues
- monitoring procedures for the health of workers
- the standard of information and training provided to workers.

If there are elected health and safety representatives at the workplace, the mine operator must involve them in consultation on health and safety matters.

The WHS Regulations have more specific duties in particular to develop a safety role for workers so they are involved in:

- implementing and reviewing the WHSMS
- identifying principal mining hazards, assessing their risks and considering any risk control measures required
- preparing and reviewing the emergency plan
- developing and implementing strategies to manage risks relating to fatigue, alcohol and drugs
- investigating incidents, especially relating to principal mining hazards, and
- testing risk controls.

Involving workers in developing and to verify the processes to be used will help keep the WHSMS practical and to the point.

Further guidance on consultation can be found in the *Code of Practice: Consulting Workers and Consulting, Cooperating and Coordinating with Others on Work Health and Safety Matters*.

3.3 Work health and safety policy

A work health and safety (WHS) policy is a commitment by the mine's senior management to improving the work health and safety of the mine's workers.

The WHS policy should:

- have objectives and measureable targets for improving work health and safety, and
- be documented and communicated to workers and other interested parties (for example, work group committee members, regulators and community groups).

It should be periodically reviewed to ensure it remains relevant and appropriate to changing circumstances and as new information becomes available.

3.4 Work health and safety action list

Creating and implementing an action list is essential if the WHSMS is to be a comprehensive and integrated system that manages all aspects of risk control as required by the WHS Regulations.

The list has to detail how each element of the WHSMS is to be implemented. It schedules the activities required and allocates the resources needed and assigns responsibilities.

The action list may be divided to suit specific parts of a mine's development for example, planning, design, construction, commissioning and ongoing operation. In large or complex organisations, the mine operation might be split into various activities or processes such as mining, processing, workshops and exploration. The action list should cover all such parts to ensure it develops an integrated approach.

It should also determine how the WHSMS is to be reviewed and the triggers for review.

3.5 Hazard management process

At the core of a WHSMS are the processes for managing hazards, in particular principal mining hazards. The processes selected must be able to deliver the work health and safety targets defined by the policy.

When selecting a hazard management process, you, as the mine operator, should also consider the nature of the hazards at the workplace (for example, chemical, physical, biological or ergonomic hazards), their extent and any impact particular work arrangements may have on a hazard management process (for example, repetitive tasks, work pace, shift work) which may result in fatigue/stress.

When planning the hazard management process, take account of:

- the resources required to manage hazards (for example, cost, time, and the need for collecting data and new information)
- the effects of different operating conditions (for example, start up, shut down and maintenance or access)
- the ability of those responsible to determine which process to use when new or unexpected hazards are identified
- the ability of contractors or suppliers to manage the hazards and risks they introduce or are exposed to, and
- specific requirements for regulated hazards (for example, dangerous goods and specialised plant).

The hazard management process used which includes identifying the hazards, assessing the associated risks and selecting the control measures will vary depending on the type of hazard and work involved. For example:

- *Principal mining hazards* where the consequences of an incident could be catastrophic, the hazard management process should be rigorous. It must result in a documented management plan that is readily understood by those who will use it. The process will involve a range of personnel and skills to ensure that all aspects of the hazard are fully considered and that the risk control measures will adequately handle all eventualities. The method and results of the assessment must be documented in the plan.
- *Other significant hazards* that are not only found in mines (for example, those involving electricity or other energy sources, explosives, etc) often have standards

and control measures available that may be mandated. The hazard management process for these types of hazards should ensure such requirements are implemented. It should also assess if additional risks might arise from interacting with any other hazards present.

- *High frequency hazards* commonly found in other industries are generally well known and there are control measures readily available from a variety of sources. Therefore the hazard management process for these types of hazards will likely focus on the maintenance aspects of the selected control measures to ensure workers are always mindful of identifying such hazards during their work and checking that the controls are functional.
- *New or unexpected hazards* to the workplace requires that both workers and supervisors are trained to recognise and engage the appropriate hazard management process. Job safety analysis (JSA) and similar processes are designed to identify and handle the more common, high frequency type hazards. But to identify new hazards may require additional WHS skills that the work group or supervisor do not have. The WHSMS should identify when it is appropriate to seek additional support.

All hazard management processes should include input from those doing the work or others who could be exposed to the risks if there is an incident.

This chapter provides guidance on what is required to implement an effective WHSMS.

4.1 Resources

A WHSMS cannot be implemented, maintained, and improved without identifying and providing adequate resources. Resources include people with specialised skills, appropriate time, authority and financial delegation. This should all be identified in the WHS action list.

Officer under the WHS Act

The representative of the mine operator becomes an officer under Section 27 of the WHS Act and therefore, they must exercise due diligence to ensure the person conducting a business or undertaking complies with their duties and obligations.

The role of an officer should be defined, documented and communicated to the relevant people in the organisation and includes:

- ensuring that WHSMS requirements are established, implemented and maintained
- reporting on the effectiveness of the WHSMS (for example, targets being met), and
- regularly reviewing and improving the WHSMS.

Contractors

Where contractors or other persons conducting a business or undertaking are involved, the mine operator should clearly define the responsibility of the management representative who will oversee and coordinate the activities of those workers. The work arrangements between the various persons conducting a business or undertaking may require a WHSMS element to deal with the obligations under Section 29 and 46 and Part 5 under the WHS Act.

Large or complex mining operations may need more than one person to implement this and other elements of the WHSMS in different parts of the operation where contractors and other persons conducting a business or undertaking are working.

4.2 Hazard management

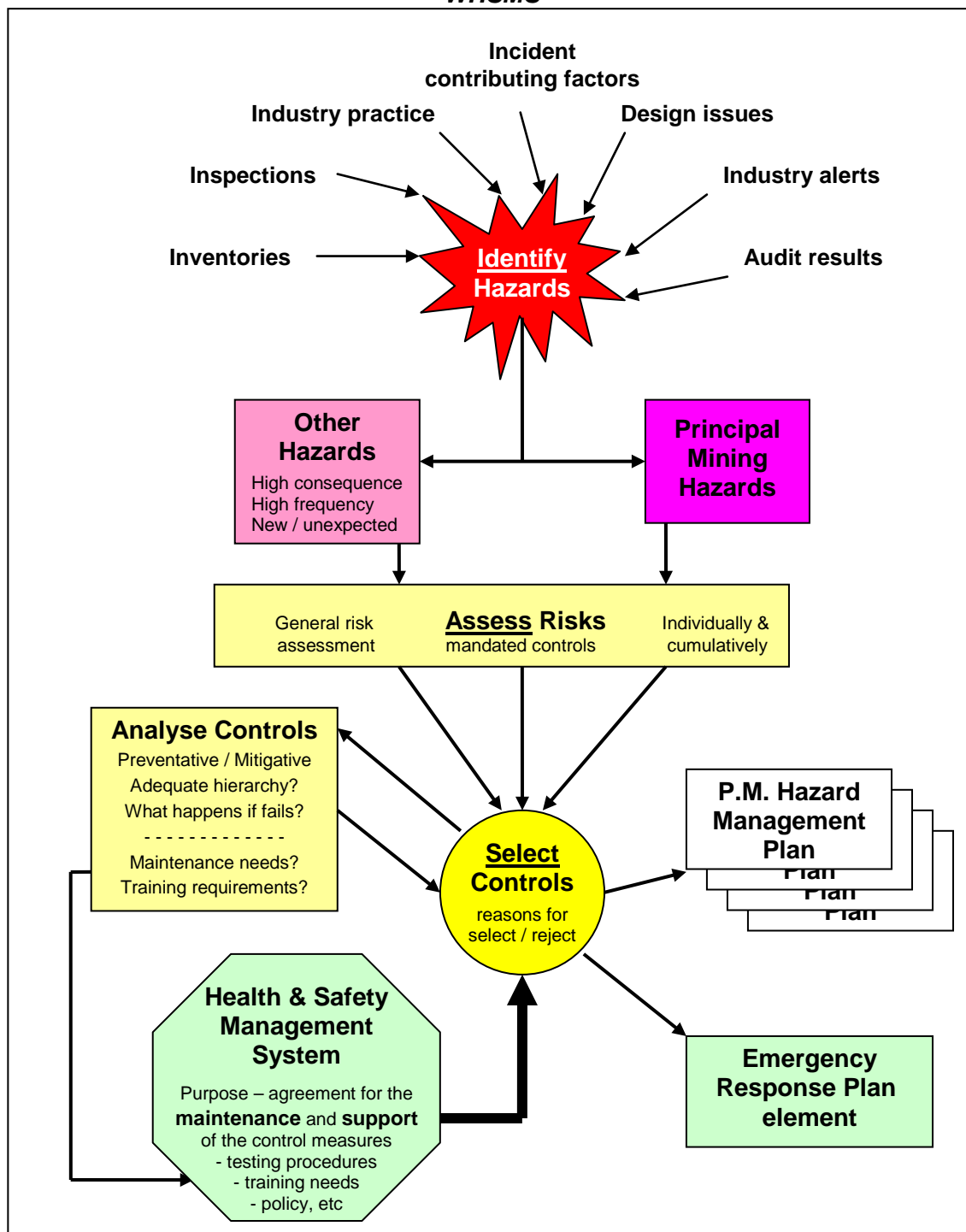
The objective of successfully implementing a WHSMS is the systematic management of hazards: identifying them, assessing risks and selecting suitable control measures. Regular testing and maintenance of those controls is essential to ensure they remain effective and for compliance.

The hazard management element in the WHSMS must:

- describe the processes used to identify the principal mining hazards and other hazards, and to assess the associated risks
- list the controls selected for implementation to eliminate or minimise the risks, and
- describe the testing and maintenance systems to ensure controls remain effective.

Figure 3 shows how the hazard management plan links to principal mining hazard management plans and the WHSMS.

Figure 3 – Components of the hazard management element showing links to Principal Mining Hazard Management Plans and the WHSMS



Identifying hazards

Identifying all hazards and risks can be done by dividing hazards into groups or even sub-groups and addressing each in slightly different ways. For example:

- Principal mining hazards are treated separately because of their potential to result in high consequences. They are activities, procedures, plant, processes, substances, situations or other circumstances involving (in summary):
 - ground instability



- inundation or inrush
 - mine shafts and winding operations
 - roads and other vehicle operating areas
 - air quality including contaminants, asphyxiant or dangerous atmospheres
 - fire or explosion
 - gas outbursts, and
 - ionising radiation
- Other hazards that might result in significant consequences include:
 - electricity
 - explosives
 - hazardous chemicals or dangerous goods
 - other plant that is controlled remotely
 - specialised or regulated equipment (for example, scaffolding, lifting)
 - hazardous or restricted work areas (for example, confined spaces, stockpiles)
 - work environment particularly if extreme (for example, noise, temperature)
 - fitness for work (for example, fatigue, stress, impairment due to alcohol or drugs)
 - drilling and resulting holes
 - open voids
 - waste disposal or spillage
 - backfilling.
- Common, 'high frequency' hazards (for example, manual tasks, using power tools, slips, trips and falls).
- New or unexpected hazards as they arise which often present significant challenges to work groups and supervisors in being able to recognise that:
 - the situation is then presenting new risks
 - it may require a different process to assess.
- During the process of identifying hazards, the following should be taken into account:
 - the way work is organised, managed, carried out or changes that may occur
 - design of workplaces, work processes, materials, plant and equipment
 - fabrication, installation, commissioning, handling and disposal of materials, workplaces, plant and equipment
 - purchasing of goods and services
 - contracting and subcontracting of plant, equipment, services and labour including contract specification and responsibilities to, and by, contractors
 - inspection, maintenance, testing, repair and replacement of plant and equipment.

Risk assessment

Risks relating to each of the above hazard groups generally require assessment in quite different ways. The hazard should be assessed both separately as well as with other hazards as the interactions may lead to other risks.

- *Principal mining hazards* must be assessed individually and also with other hazards in case there is potential for the combination to increase risks. A comprehensive hazard management plan must address all aspects of the associated risks. The investigation and analysis must be specific and appropriate to the hazard with the results documented. The assessment must assign the likelihood and severity of causing harm, preferably before and after controls are implemented.

- *Other significant hazards* that may exist at many workplaces may be suited to more generic risk assessments. Such risk assessments may be restricted to determining if there is anything different or unusual about the risk the hazards might pose in particular work areas. Assessment of these types of hazards should consider relevant standards, procedures and controls that have been developed over time. The skills and experience of those completing the assessment process should be relevant to these hazards.
- *Common 'high frequency' hazards* are generally well known and have well understood controls available. Assessment can often be restricted to determining if there is anything different or unusual about the risk the hazards might pose in particular work areas.
- *New or unexpected hazards* may be assessed with a number of processes from thorough, documented 'change management' through to a simple on-the-spot 'JSA'. Training of workers is essential to enable them to recognise such hazards and either implement the chosen risk assessment process or refer to a supervisor to trigger a more detailed risk assessment.

In assessing risks, the mine operator should consider the:

- nature of the hazard or risk
- likelihood of the hazards or risk causing harm
- possible severity of the harm, and
- state of knowledge about the hazard or risk and how to eliminate or minimise them.

Other matters that should be considered in assessing risk are:

- the affect of different operating conditions - normal or abnormal (for example, shut down and start up, weather and possible misuse)
- past incidents and potential emergency situations, and
- past work activities, current activities and planned activities.

Controlling risks

Controlling risks involves eliminating the risk so far as is reasonably practicable. If this is not able to be done, the risk must be minimised so far as is reasonably practicable. The most effective way to do this is to select control measures in accordance with the hierarchy of controls. It is likely that a combination of control measures need to be used. The hierarchy of controls is as follows:

- *substituting* a new activity, procedure, plant, process or substance related to the hazard
- *isolating* the worker from the hazard (for example, guarding, remote controls)
- *engineering* controls (for example, interlocks, pressure relief valves)
- *administrative* controls (for example, safety rules, operating procedures), and
- *PPE* – personal protective equipment.

When selecting controls, you need to look for controls that will prevent the incident occurring (preventative). Any controls that minimise or otherwise lessen (mitigate) the consequences of the incident are only supplementary to prevention.

Risk controls for principal mining hazards must be documented in the WHSMS in the form of a 'principal mining hazard management plan'. In assessing risk and selecting controls to implement, the reasons for adopting or rejecting those controls must also be documented.

It is advisable that controls for all other types of hazards be documented in a similar manner so that when they are reviewed (before making changes, following incidents, deficiencies in

controls, health and safety representative requests), the supporting information is readily available. If a control is reviewed in such circumstances, the WHSMS must also be reviewed and as necessary, revised.

Control measures often require supporting documentation, procedures, information, training, resources and testing to make and keep them effective. The following may have to be considered when selecting appropriate controls:

- procedures for implementing control measures during the design stage
- availability of competent personnel to verify that designs and modifications meet requirements
- purchasing and receiving procedures to ensure items and services comply with WHS Act and Regulations and include any safety information
- 'permit to work' systems for high risk or unknown hazards (for example, erecting or digging)
- training needs and changes to work procedures
- if PPE is required, training on their correct use and maintenance
- supervision to check that tasks are complete and work instructions and procedures are followed
- records for inspection results, maintenance, repair and alteration of plant
- processes for identifying plant that requires registration and ensuring that registration and 'fit for purpose' is maintained
- appropriate controls for working on or near plant and equipment being cleaned, serviced, repaired or altered
- verification that plant and equipment is safe after repair or alteration
- procedures for withdrawing damaged or unsafe plant and equipment from service, and
- procedures to ensure that the workers are competent and, if required, have the appropriate licences to operate high risk plant.

Once the selected control measures are in place, the mining operator must also review risk control measures and, if necessary, revise them.

If controls involve monitoring (for instance, health surveillance required under Part 9.3 of the WHS Regulations), the parameters, triggers and corrective actions must be documented as part of the control. Measurements should be recorded and an incident reported if any triggers are activated.

For example, monitoring as a control for health might cover:

- air quality
- noise levels
- exposure to hazardous substances or radiation, or
- fatigue or other impairment.

Other types of monitoring might cover:

- wear or other deterioration of structures or plant
- ground movement, or
- pressures on structures or in containers.

Matters to consider when reviewing controls include:

- Are parameters and limitations known and how can they be checked?
- How do you verify the effectiveness of the control?
- What level of maintenance is required to keep the control effective and is it on the maintenance schedule?

- What are the consequences if the control fails?
- What training/re-training is required for workers?
- How often does the control need reviewing?

4.3 Emergency response plan

Mine operators must prepare an emergency plan. The emergency plan should collate a list of controls that were selected from the various risk assessments which would require urgent activation following an incident. The plan must be documented and include the procedures to activate those controls which will minimise the effects of an incident.

The emergency plan should specify the resources that may be needed if a risk eventuates (for example, breathing apparatus, lifting gear, fire fighting equipment). The resources specified must complement any additional resources that may be needed from the emergency services operating in the community, or from other mines and suppliers.

The plan requires appointing and training competent people to be responsible for the control of emergency situations.

Emergency instructions, including the names and control details of key personnel should be clear and placed where all personnel are able to see or find them. Planning should also consider resources and people required if the emergency situation continues for more than a single shift.

In considering potential emergencies, the following should be addressed:

- multiple exits and signage
- communication systems and locating persons who are in the workplace
- reduced visibility or irrespirable atmospheres
- ability to provide continuous or ongoing rescue operations (for days)
- measures for isolating an area with an emergency
- the roles and responsibilities for carrying out and coordinating emergency action
- the training, maintenance and testing required to ensure the plan is operational
- transport and specialised equipment needed to address potential scenarios
- maintaining up-to-date plans of the mine which are reviewed quarterly
- ensuring all personnel can understand – for example if required, providing material in other languages, and
- the location of services, equipment and personnel to minimise impacts from any emergency.

Emergency equipment, exit signs and alarm systems should be inspected, tested and maintained at regular intervals. The suitability, location and accessibility of emergency equipment should be assessed by competent persons.

Emergency procedures must be tested at least annually, including being rehearsed and reviewed in conjunction with the local emergency services.

Further information on developing an emergency management plan can be found in the *Code of Practice: Emergency Planning for Australian Mines*.

4.4 Consultation, information, instruction and training

The mine operator must consult with workers and any health and safety representative in the workplace on:

- the implementation and review of the WHSMS
- identifying hazards and risk
- selection and testing of controls

- decisions on procedures related to health and safety
- review of controls following an incident
- emergency planning, and
- testing and feedback on emergency response.

Where possible, workers should participate in discussions about safety matters relevant to their work and in developing any policies and procedures for their work. The WHSMS should describe how that consultation is to be done.

Training covers many requirements including initial induction of visitors, orientation for workers, specific work requirements or procedures, general safety such as the WHSMS, specific risk control measures and refresher training. Each type of training has different objectives but it is an essential activity for the operator to manage safety. It is important that training is documented to ensure consistency, minimise possible gaps and verify that competency was achieved.

In particular, you, as the mine operator, must provide workers with information, instruction and training on hazards at the mine, the implementation and use of risk control measures and the content and implementation of the WHSMS. Workers will need additional training for their work and any specific controls required, particularly to implement new control measures.

For training, you should take into account the characteristics and composition of the workforce (for example, level of education, literacy and the language spoken), work responsibilities, the complexity of hazards and the severity of risks. Training records should be reviewed to help assess the need for retraining, updating or additional training, particularly if activities, processes or equipment change.

The mine operator should ensure that all workers requiring training, including contractors and regular visitors, complete the training appropriate to their needs.

4.5 Documentation

The WHSMS must be documented and in a format suited to the workplace (printed and or/electronic). It does not have to be in a single document if the requirements to manage work health and safety are complex (for example, at a large mine).

The document should describe the core elements of the WHSMS and how they relate. It should reference any other necessary work health and safety documentation or sets of data that may contain more detailed information on specific parts of the WHSMS (for example, process information, organisation charts, internal standards and operating procedures).

It is important the document is readily accessible. Procedures may be required to control access to the WHSMS documentation to ensure that only the current version is available and that any supporting documentation or data sets are up-to-date. However, document control should never restrict access to information necessary for implementing the WHSMS.

Any procedure for document control should require that:

- documents are approved for use by the responsible person
- documents are accessible and kept in good condition for the specified period
- versions are identified and dated for periodic review, and
- obsolete documents are removed and archived for legal requirements and reference.

Mine record

There is a prescribed requirement to keep a mine record which covers:

- any notices issued under Part 10 of the Act
- every notifiable incident including the operator's investigation
- every 'high potential' incident, and
- and for underground mines, the shift handover report required by Regulation 9.2.13.

A *high potential incident* is not necessarily reportable but includes an event that creates a risk of a significant adverse effect even if that does not expose someone directly to that risk.

The mine record must keep for seven years from when it was made.

Further information on what should be included in the mine record can be found in the *Code of Practice: The Mine Record*.

5 MEASUREMENT AND EVALUATION

This chapter provides guidance on what is involved in measuring and evaluating a WHSMS. It includes the requirement to review the WHSMS.

The mine operator must also consult with workers and involve them during the review stage.

5.1 Monitoring and measurement

A mine operator must have documented procedures to monitor and measure the performance of the WHSMS. This is to assess if:

- risk control measures are effective
- the objectives and targets set out in the policy are met
- consistent application of the WHSMS, and
- compliance with WHS legislation.

When developing the policy and action list, the measures selected to determine if the objectives and targets are being met should indicate if corrective actions or a review are required to a WHSMS. Reviews, audits and incidents may also trigger changes to the WHSMS.

5.2 Incident investigation and preventative action

The WHS Act requires notification of specific incidents. However, any incident (an unplanned event having at least the potential for injury, ill health, damage or other loss) is evidence that the selected controls are not adequately controlling the risk which in turn triggers the need to review them and the WHSMS.

Therefore it is essential that all incidents are investigated including near misses. The result of the investigation should document what corrective actions are required to prevent a similar or a more serious incident, happening in the future.

A procedure may be necessary to fully identify the causes of any incidents. The basic elements of the procedure should be to:

- identify the factors that contributed to the incident
- identify the necessary corrective action/s to prevent it, or a more serious incident happening again
- implement or modify controls to at least further minimise the risks, and
- review and if required, revise the WHSMS.

Where possible, workers who were affected by the incident should be involved in the investigation and where appropriate, even be part of the investigating team. Therefore training of workers in carrying out an incident investigation is important to help them to provide constructive input.

5.3 Reviews and audits

A mine operator must review and, if necessary, revise the WHSMS at least every three years. A review should be done:

- if a risk control measure is revised:
- before making a significant change to the mining operations
- if a notifiable incident occurs at the mine
- if an audit of performance standards indicates a deficiency in a risk control measure
- after a worker's work is changed due to health surveillance results
- if there is evidence that a risk control measure does not adequately control the risk, and

- if a health and safety representative at the mine requests the review.

A review should consider:

- the extent to which objectives and targets have been met
- the continuing suitability of the WHSMS in relation to any changing conditions and new information, and
- concerns of relevant stakeholders.

Information to assist in the review could include:

- results of any internal or system audits (see below)
- reports on work health and safety performance
- incident reports and investigations
- hazard identification and risk assessment activities
- changes to work health and safety laws
- changes to work health and safety standards, and
- changing community expectations.

An audit systematically assesses whether the activities required by the WHSMS and the results meet the targets and objectives of the work health and safety policy.

An audit could be carried out by supervisors and workers. In the case of a more complex WHSMS, a formal, independent audit could be done by a specialised auditor.

APPENDIX A – PRINCIPAL MINING HAZARD MANAGEMENT PLANS – RISK ASSESSMENT

Principal mining hazard	Matters to be taken in consideration when assessing risks and selecting controls for principal mining hazards
Ground/strata instability	<p>For design, operation and closure activities:</p> <ul style="list-style-type: none"> • local geological structure • rock properties and their influence on stability and stress • possible seismic activity (either natural or induced) • the size and geometry of the mine openings • pillar dimensions, rock type and any planar orientation • previously excavated or abandoned workings • subsidence or settlement (either controlled or through strain) • drainage patterns, groundwater regimes, water inflow and mine dewatering procedures • design, control and monitoring of blasting • equipment and procedures used for scaling • the design, installation and quality control of rock support • the effect of time and oxidation on rock support and stability • monitoring of openings and excavations where appropriate • equipment and procedures for the monitoring, recording and analysis of data related to strain and seismicity • the design, construction, operation and maintenance of stockpiles or drawpoints • the specification and type of material used for to fill mined out areas and monitoring of volumes against void space • the possibility of airblast and its potential impact • the stability of slopes, particularly over portals and roads.
Inundation and inrush	<p>For design, monitoring and emergency testing:</p> <ul style="list-style-type: none"> • potential sources of inundation including: extreme weather, failure of levies or dam structures; failure or blocking of channels for flow (either regular or overflow/emergency) • potential sources of inrush including: current or disused mine workings, along the same seam or across strata, surface water bodies, backfill operations, highly permeable aquifers, bore holes, faults or other geological weaknesses • magnitude of all potential sources and maximum flow rates • the distance and rock strength of strata remaining to other worked areas and probing or confirming techniques/controls • the location, design and construction of dams, tailings and other contained bodies of water or potentially fluid material • worst case scenarios for each potential source especially: the accuracy of plans of other workings, variation in rock properties, geological weaknesses or similar unknowns • potential for the accumulation of water, gas or other materials that could liquefy or flow in other workings or locations.
Mine shafts and winding operations	<p>For design, construction, operation, maintenance, repair and decommissioning activities:</p> <ul style="list-style-type: none"> • communication to and from the winder controller and the entrance to every shaft, level in use and any conveyance carrying persons • fires in underground operations, the shaft or winder areas • any unintended or uncontrolled movement of the conveyances within the shaft • detached conveyance falling down the shaft

Principal mining hazard	Matters to be taken in consideration when assessing risks and selecting controls for principal mining hazards
	<ul style="list-style-type: none"> • fall of persons, equipment, materials or support structure into or within, the shaft • failure of, or damage to, safety related equipment and the possible need for backup controls covering in particular: • ropes bearing the weight of the shaft conveyance • controls and limiting devices to prevent overwind, overrun, overspeed, or 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 systems including emergency brakes and preventing free-fall of a conveyance • warning systems for any emergency in the shaft • methods for safely securing material or plant within or connected to, a conveyance • measures to prevent spillage into the shaft during loading of plant or material onto a conveyance • possible injury to people in a conveyance from material being carried in the conveyance or falling from a conveyance • means of escape from a stalled conveyance • monitoring for automatic winding systems from outside the winder house.
Roads and other vehicle operating areas	<p>For design, construction, use and maintaining activities:</p> <ul style="list-style-type: none"> • any banks or steep drops adjacent to the operating area • for intersections: the angles, driver line of sight (left / right drive), separation by direction or barriers, speed limits • interactions between vehicles considering mixes of speed, vision limitations and stopping distances of the various types of heavy and light mobile equipment on site • interactions between vehicles and pedestrians (including supervision, maintenance personnel and other workers) • the potential for interaction between mining mobile plant and public traffic • the potential for interaction between mobile plant and fixed structures, including overhead and underground power lines, tunnel walls and roofs. • remote control vehicles (especially underground) such as controls for exclusion areas and proximity detection • road maximum grade, minimum widths and radius for curves, camber, surface material specifications and drainage needs • the effects of weather on road surfaces and run off controls • characteristics of heavy mobile plant or machinery to be moved only sporadically • line of sight or limitations for both direction and distance • park-up requirements and access for drivers.
Airborne dust and other airborne contaminants	<p>For plant, enclosed spaces or designing ventilation systems:</p> <ul style="list-style-type: none"> • calculation of air volume for dilution to exceed the combined contamination coming from the maximum engine capacity and other possible sources within that workplace • 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 • exposure standards for contaminants and trigger levels for dangerous or asphyxiant atmospheres (note low oxygen)

Principal mining hazard	Matters to be taken in consideration when assessing risks and selecting controls for principal mining hazards
	<ul style="list-style-type: none"> length of exposure (particularly if shift exceeds eight hours) monitoring methods and equipment including quality control trigger alarms for exceeding exposure or dangerous limits a plan of the ventilation system showing volumes, controls and vital support infrastructure (for example, fans, doors, power) intake and exhaust locations for ventilation systems to limit potential for additional or cross-contamination common controls including suppression, extraction systems and ventilation to reduce, extract or dilute contamination the risk of interference with ventilation control devices additional redundant controls or procedures should the ventilation system fail either totally or in part maximum distances from a working face for ventilation ducting and brattice lines associated hazards for toxic, asphyxiant or dangerous atmospheres (for example, sources for ignition or contamination within the ventilation system or its controls) preventing intake air travelling across the face of a permanent seal in a coal mine possibility of inrush or leakage into intakes of atmospheric contaminants from goaf, sealed or abandoned areas.
Fire or explosion	<p>For construction, operating and maintenance areas and activity:</p> <ul style="list-style-type: none"> potential sources of ignition, fire or explosion location of storage areas for flammable, combustible and explosive materials in relation to access, egress and ventilation pathways activities using flammable materials or sources of heat types and location of detection systems to mitigate or suppress occurrences of fire, gas or explosion the emergency equipment available or required for an event possible locations for the accumulation of explosive dusts and potential for propagation into other parts of the mine the possibility for gas outbursts and their source/location inspecting, sampling and analysing dust layers and dust suppressants specification and use of: <ul style="list-style-type: none"> flame proof and explosion-protected diesel engines flameproof and anti-static conveyor systems gas monitoring systems electrical supply, fittings and intrinsically safe equipment fire proof doors, airlocks, refuges and escape-ways refuges and their supporting infrastructure.
Gas outbursts	<p>For design, construction, use and maintaining activities</p> <ul style="list-style-type: none"> 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 potential for accumulation of gases in existing and abandoned areas of the mine nature of the gas that could be released gas levels in the material being mined, and gas seam pressures.
Ionising radiation	<p>For design, operating and maintenance activities:</p> <ul style="list-style-type: none"> potential sources of both natural radiation and ionising equipment



Principal mining hazard	Matters to be taken in consideration when assessing risks and selecting controls for principal mining hazards
	<ul style="list-style-type: none">• specification of exposure levels• procedures for work in ionising environments or equipment• waste management plan• disposal procedures.• the type of radiation (alpha, beta or gamma), and• the potential for and length of exposure.

APPENDIX B – OTHER RELEVANT INFORMATION

Codes of Practice

- *Code of Practice: How to Manage Work Health and Safety Risks*
- *Code of Practice: Work Health and Safety Consultation, Co-operation and Co-ordination*
- *Code of Practice: The Mine Record*
- *Code of Practice: Emergency Response in Australian Mines*
- *Code of Practice: Inundation and Inrush Hazard Management*
- *Code of Practice: Strata Control for Underground Coal Mines*
- *Code of Practice: Roads and Other Vehicle Operating Areas*
- *Code of Practice: Managing Naturally Occurring Radioactive Materials*
- *Code of Practice: Ground Control in Underground Mines*
- *Code of Practice: Ground Control in Open Pit Mines*
- *Code of Practice: Ventilation in Underground Mines*
- *Code of Practice: Mine Closure*
- *Code of Practice: Health Monitoring in Mining*
- *Code of Practice: Survey and Drafting Directions for Mine Surveyors*

Australian Standards

- AS/NZ 4801 - Occupational health and safety management systems
- AS/NZ 4804 - Occupational health and safety management systems - General guidelines on principles, systems and supporting techniques
- [Insert national regulation 2011].
- AS ISO 15489.1: 2002 Records Management, Part 1-General
- AS ISO 15489.2: 2002 Records Management, Part 2- Guidelines
- AS/NZS 4804: 2001 OH&S Management Systems (Section 4.3.3.2 – Reporting)

Other Publications

- *Emergency preparedness and mines rescue guidelines*, Mines Safety, NSW
- *Guidance Note - QGN 15 Emergency preparedness for small mines and quarries*, Qld Department of Employment, Economic Development and Innovation, Mines Inspectorate
- *Guide to emergency preparedness – HIF audit 2009*, WA Department of Mines and Petroleum, Resources Safety
- *Guideline - Emergency Preparedness for Underground Fires in Metalliferous Mines*, WA Department of Industry and Resources; dmp.wa.gov.au
- *Guideline - Refuge chambers in underground metalliferous mines*, Resources Safety, Department of Consumer and Employment Protection, Resources Safety
- *Mine Design Guidelines - MDG 1020 Guidelines for underground emergency escape systems and the provision of self rescuers*, NSW Department of Industry and Investment
- *Mine Design Guidelines - MDG 1022 Guidelines for determining withdrawal conditions from underground coal mines*, NSW Department of Industry and Investment
- *Mine Design Guidelines - MDG 1020TR Technical Reference Material for Underground Emergency Escape Systems and Provision of Self Rescuers*, NSW Department of Mineral Resources
- *Mine Design Guidelines - MDG 1032 Guideline for the Prevention, Early Detection and suppression of Fires in Coal Mines*, NSW Department of Industry and Investment
- *Queensland Level 1 Mine Emergency Exercises*, Qld Government
- *Recognised Standard 08 - Conduct of mine emergency exercises*, Qld Government

Websites



- NSW Department of Primary Industries, Minerals and Petroleum – www.dpi.nsw.gov.au/minerals
- Mines Rescue (NSW) – www.minesrescueservices.com
- WA Department of Mines and Petroleum – www.dmp.wa.gov.au
- Queensland Department of Employment, Economic Development and Innovation, Mines Inspectorate – www.dme.qld.gov.au