



Australian Government

RIIMCU502E Implement the gas management plan

Release: 1

RIIMCU502E Implement the gas management plan

Modification History

Release	Comments
Release 1	This version first released with RII Resources and Infrastructure Industry Training Package Version 5.0.

Application

This unit describes the skills and knowledge required to implement gas management plans in coal mining, including implementing and reviewing gas monitoring and ventilation/gas control measures.

This unit is appropriate for those working in supervisory roles or technical specialist roles. They generally monitor a broad range of operational activities in their area of responsibility and are responsible for monitoring a safe work environment.

Licensing, legislative and certification requirements that apply to this unit can vary between states, territories and industry sectors. Users must check requirements with relevant body before applying the unit.

Unit Sector

Coal mining (underground)

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Plan and prepare to implement gas management plan	1.1 Access, interpret and implement gas management plan documentation and confirm work activity is compliant 1.2 Access, interpret and clarify legislative and site requirements relating to gas management 1.3 Identify and communicate roles and responsibilities to all involved persons according to gas management plan 1.4 Identify, forecast, obtain and allocate/schedule resources required to implement gas management plan 1.5 Identify training needs for personnel involved according to gas management plan and within scope of own role

ELEMENT	PERFORMANCE CRITERIA
	1.6 Review gas management procedures and implement identified changes according to site requirements
2. Implement mine gas monitoring measures	2.1 Identify, measure and interpret impact of changes in composition, concentration of gas and gas make, and associated hazards on mine atmosphere 2.2 Implement procedures for installation, operation and maintenance of gas monitoring systems according to gas management plan 2.3 Implement systems and procedures for collection and analysis of gas samples according to gas management plan 2.4 Record and report monitoring system data according to gas management plan 2.5 Investigate changes in mine atmosphere status and implement corrective action according to gas management plan and site requirements 2.6 Record and process reports according to gas management plant and site requirements
3. Implement ventilation/gas control measures	3.1 Monitor mine environment and action according to gas management plan 3.2 Implement gas hazard control procedures associated with gas drainage and outburst mining conditions according to gas management plan 3.3 Identify situations where trigger levels are reached and implement response procedures according to gas management plan 3.4 Implement ventilation and gas monitoring systems and surveys for systems status assessment according to gas management plan 3.5 Implement procedures addressing relocation, operation and maintenance of drilling rigs and gas drainage infrastructure according to gas management plan and site requirements 3.6 Implement gas emergency and evacuation procedures according to mine safety management system and site requirements
4. Audit gas management plan	4.1 Review effectiveness of gas management plan implementation according to gas management plan 4.2 Audit mine gas monitoring systems operations according to legislative requirements and gas management plan 4.3 Audit mine gas control devices according to legislative and site requirements 4.4 Audit recording systems according to gas management plan 4.5 Audit the maintenance program and procedures according to gas management plan 4.6 Audit gas emergency and evacuation procedures according to mine safety management system

ELEMENT	PERFORMANCE CRITERIA
	4.7 Audit gas management training plan according to gas management plan

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

SKILL	DESCRIPTION
Numeracy	Calculates resourcing requirements, performs mathematical calculations and applies mathematical and scientific laws and theorem
Oral communication	Conveys information and requirements clearly and listens actively
Reading	Identifies and interprets relevant information from workplace procedures, documentation and legislation
Writing	Prepares specific information that complies with requirements, using sector-specific vocabulary, grammatical structures and conventions

Unit Mapping Information

Supersedes and is equivalent to RIIMCU502D Implement the gas management plan.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272>

Assessment Requirements for RIIMCU502E Implement the gas management plan

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- implement gas management plans on at least two occasions, including:
 - conducting investigations and preparing reports
 - conducting audit and review processes
 - completing site document control requirements
 - implementing procedures for relocation, operation and maintenance of drilling rigs and gas drainage infrastructure.

During the above, the candidate must:

- locate and apply relevant legislation, documentation, policies and procedures and confirm work activity is compliant
- apply procedures and techniques for implementing gas management plans, including:
 - operating hand held monitoring equipment
 - collecting, collating and evaluating gas management data
 - accessing, evaluating and applying data from monitoring systems and equipment
 - applying risk management processes and techniques
 - accessing and analysing gas information related to the mine
 - interpreting and applying mathematical and scientific theorems/laws related to gas
- work with others to implement the gas management plan in a manner that meets required outcomes, including:
 - communicating clearly and concisely with others to receive and clarify work instructions, and convey work progress
 - identifying and implementing gas management training requirements, programs, systems and procedures
 - identifying the relevant information and scope of the work necessary to meet required outcomes.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- key legislation required to implement gas management plans
- key procedures and documentation required to implement gas management plans
- principles of ventilation management, including mine and goaf ventilation systems
- methods of mine ventilation and their applications and limitations, including:
 - exhaust/force
 - antitropical
 - homotropical
 - flank returns
 - ascensional/decensional
 - bleeder
 - Z/U/Y systems
- methods of panel gas management and their applications and limitations, including:
 - homotropical and antitropical, including in conjunction with use of goaf bleed and back return
 - auxiliary fans
 - coursed ventilation (narrow side/wide side)
 - machine mounted scrubber systems
 - compressed air venturis
 - bleeders
- methods of gas drainage, including:
 - applications and limitations against mine design, mine and panel ventilation systems, systems of mining and current and future mine development
 - coal characteristics and coal seam gradients on mine gas management plans
 - mining techniques and impact of mine and panel design on gas management
 - gas drainage on airborne contaminant generation during mining
- techniques for applying geological data and identifying impact of differing geological features and conditions on gas management and outburst, including:
 - faults
 - dykes
 - intrusions
 - strata deformities
- impacts of intersecting and intersected holes and hole design components and factors relating to gas management plans, including:
 - types of mine gases, including:
 - characteristics under varying circumstances
 - sources
 - physiological effects

- methods of detection
- types of mine fires and possible impacts on gas management
- types of mine explosions, including ignition sources and possible impacts on gas management
- causes of pressure changes and impacts on gas management
- sources of heat and humidity and factors which may impact mine gas management
- effects of re-circulation
- outburst control methods
- underground water management techniques
- inertisation techniques
- types, characteristics, applications, limitations of equipment, monitoring systems and techniques, including:
 - mine fans
 - gas control devices, including:
 - design criteria and specifications
 - distribution/placement criteria
 - de-gassing methods of control, including:
 - brattice
 - auxiliary fans
 - compressed air venturis
 - sails
 - hurdles
 - bleeders
 - fixed gas monitoring systems
 - portable monitoring equipment
 - computer-based systems for mine gas analysis
 - gas surveys types, frequency and method for conducting, including:
 - pressure
 - quantity
 - temperature
 - gas
 - ventilation survey types, frequency and method for conducting, including:
 - pressure
 - temperature
 - gas
 - alarms and trigger points and levels
 - mine and goaf ventilation systems, including the following ventilation devices:
 - stoppings
 - overcasts
 - regulators

- preparation seals
- ventilation doors
- bulk heads
- goaf seals
- final seals
- pressure chambers
- air locks
- sling psychrometers, anemometers and velometers
- techniques for recording and reporting monitoring system data
- ventilation theory, including:
 - gas laws, including Charles's law and Boyle's law
 - natural ventilation
 - Coward's triangle
 - Graham's ratio
 - Ellicott Diagram
 - gas make
 - Trickett's ratio
 - leakage
 - psychrometry and heat
 - CO and CO₂ ratios
 - Kirchoff's laws
- techniques for identifying individual training needs
- techniques for auditing and reviewing gas management systems and processes
- principles, processes and techniques for emergency response, evacuation and disaster planning
- techniques for leading and coordinating work activities with others.

Assessment Conditions

Mandatory conditions for assessment of this unit are stipulated below. The assessment must:

- include access to:
 - gas management plan
- be conducted in a safe environment; and,
- be assessed in the context of this sector's work environment; and,
- be assessed in compliance with relevant legislation/regulation and using policies, procedures and processes directly related to the industry sector for which it is being assessed; and,
- confirm consistent performance can be applied in a range of relevant workplace circumstances.

Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

Assessor requirements

Assessors must be able to clearly demonstrate current and relevant industry knowledge and experience to satisfy the mandatory regulatory standards as set out in the Standards for Registered Training Organisations (RTOs) 2015/Australian Quality Training Framework mandatory requirements for assessors current at the time of assessment and any relevant licensing and certification requirements. This includes:

- vocational competencies at least to the level being delivered and assessed
- current industry skills directly relevant to the training and assessment being provided
- current knowledge and skills in vocational training and learning that informs their training and assessment
- formal relevant qualifications in training and assessment
- having knowledge of and/or experience using the latest techniques and processes
- possessing the required level of RII training product knowledge
- having an understanding and knowledge of legislation and regulations relevant to the industry and to employment and workplaces
- demonstrating the performance evidence, and knowledge evidence outlined in this unit of competency, and
- the minimum years of current** work experience after competency has been obtained as specified below in an industry sector relevant to the outcomes of the unit.

It is also acceptable for the appropriately qualified assessor to work with an industry expert to conduct assessment together and for the industry expert to be involved in the assessment judgement. The industry expert must have current industry skills directly relevant to the training and assessment being provided. This means the industry subject matter expert must demonstrate skills and knowledge from the minimum years of current work experience after competency has been obtained as specified below, including time spent in roles related to the unit being assessed:

Industry sector	AQF indicator level***	Required assessor or industry subject matter expert experience
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Infrastructure	1	1 year
	2	2 years
Drilling, Coal Mining, Extractive (Quarrying), Metalliferous Mining and Civil Infrastructure	3-6	3 years
Other sectors	Where this unit is being assessed outside of the resources and infrastructure sectors assessor and/or industry subject matter expert experience should	

Industry sector	AQF indicator level***	Required assessor or industry subject matter expert experience
		be in-line with industry standards for the sector in which it is being assessed and where no industry standard is specified should comply with any relevant regulation.

*Guidance on simulated environments has been stipulated in the Companion Volume Implementation Guide located on VETNet.

**Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting a minimum number of site assessments as determined by the relevant industry sector, across various locations.

*** While a unit of competency does not have an AQF level, where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered as the AQF indicator level for assessment purposes.

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