Australian Government

Assessment Requirements for RIIMCU403E Apply and monitor the gas management plan

Release: 1

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Modification History

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

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:

- apply and monitor gas management plans on at least two occasions, including:
  - applying systems for mine gases, including seam gases and gases from introduced sources, including:
    - methane
    - carbon dioxide
    - oxides of nitrogen
    - hydrogen
    - carbon monoxide
    - sulphur dioxide
    - hydrogen sulphide
    - hydrocarbons
    - combinations
    - oxygen
    - nitrogen
  - applying alarm/trigger level systems and action plans, including those for:
    - gas concentration, make and ratios
    - spontaneous combustion (physical and gaseous)
    - combustion indicators
    - condition monitoring for fans (vibration, temperature, current and failures)
    - ventilation devices
    - monitoring hardware
    - virgin gas content of coal seams
  - applying gas management devices and methods, including:
    - gas drainage

- infusion
- scrubbers
- automatic gas detectors
- tube bundle systems
- de-gassing device on auxiliary fans
- gas monitoring systems
- inertisation systems
- monitoring devices, including:
  - barographs
  - tube bundles
  - real time telemetry
  - portable (hand held) monitoring devices
  - bag samples
  - gas chromatography.

During the above, the candidate must:

- locate and apply relevant legislation, documentation, policies and procedures and confirm work activity is compliant
- implement the requirements, procedures and techniques for applying and monitoring of gas management plans, including:
  - interpreting, communicating and applying technical information
  - operating hand-held monitoring equipment
  - accessing, evaluating and applying data from monitoring systems and equipment
  - collecting, collating, evaluating and reporting gas data
  - applying and interpreting mathematical and scientific theorems/laws relating to gas management
  - accessing and interpreting archival and historical gas information related to the mine
  - conducting investigations and preparing reports
  - identifying training needs for personnel involved
- work effectively with others to apply and monitor gas management plans that meet the required outcomes, including:
  - organising work activities to meet task requirements
  - communicating clearly and concisely with others to receive and clarify work instructions
  - complying with reporting requirements and procedures
  - determining coordination requirements throughout work activities.

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 apply and monitor gas management plans
- key procedures and documentation required to apply and monitor gas management plans, including those for:
  - developing the requirements and processes of gas management plans
  - applying risk assessment and management processes
  - monitoring and maintaining ventilation, including:
    - air quality and quantity
    - maximum/minimum values
    - control and distribution
    - flammable gas limits
    - ventilation fan
    - gas monitoring inspections
    - recording/reporting
  - identifying and managing environmental issues, hazards and risks
  - conducting audit and review processes and techniques
- impacts of mining techniques and mine and panel layout on panel gas management
- impacts of coal characteristics and coal seam gradients on mine gas management
- impacts of differing geological features and conditions on gas management, including:
  - faults, dykes, intrusions and strata deformities
  - strata geology, including:
    - coal seam gradient
    - moisture content
    - friability
    - porous features of coal seams
    - stresses and intrusions
    - impact on gas drainage
  - core sampling techniques
  - in-seam drilling techniques
  - impacts of intersecting holes and hole design
- applications, procedures and limitations of panel gas management, including:
  - forcing and exhausting
  - homotropal and antitropal (including conjoined use of goaf bleed and back return)
  - auxiliary fans
  - coursed ventilation (narrow side and wide side)
  - recirculation
  - machine mounted scrubber systems
  - ducted systems
  - compressed air venturis
  - bleeders
- principles, components and limitations of gas management plans, including:

- mine gas types, characteristics, sources, physiological effects and detection methods, including:
  - methane
  - carbon dioxide
  - oxides of nitrogen
  - hydrogen
  - carbon monoxide
  - sulphur dioxide
  - hydrogen sulphide
  - hydrocarbons
  - combinations
  - oxygen
  - nitrogen
- alarm/trigger level system and action plan types, including those for:
  - gas concentration/make/ratios
  - spontaneous combustion (physical and gaseous)
  - combustion indicators
  - condition monitoring for fans (vibration/temperature/current/failures)
  - ventilation devices
  - monitoring hardware
  - virgin gas content of coal seams
- gas management devices and methods, including:
  - gas drainage
  - infusion
  - scrubbers
  - automatic gas detectors
  - tube bundle systems
  - de-gassing device on auxiliary fans
  - gas monitoring systems
  - inertisation systems
  - monitoring devices, including:
    - barographs
    - tube bundles
    - real time telemetry
    - portable (hand held) monitoring devices
    - bag samples
    - gas chromatography
- mine fires types, ignition sources and potential impacts on gas management
- mine explosions types, ignition sources and potential effects on gas management
- gas make characteristics

  - pressure change causes and potential impacts on gas management
  - heat and humidity sources and potential impacts on gas management
  - impact of water on ventilation
  - outburst indicators
  - inertisation techniques
  - general effects of velocity pressure, duct and stopping leakage
- 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 used 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/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
- general uses and applications of ventilation theory
- techniques for identifying individual training needs
- principles, processes and techniques for emergency responses, evacuations and disaster planning
- techniques for coordinating and communicating job 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 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.

Links

Companion Volume Implementation Guide is found on VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272