



Australian Government

Department of Education, Employment and Workplace Relations

RIIMCU501A Implement the spontaneous combustion management plan

Release: 1

RIIMCU501A Implement the spontaneous combustion management plan

Modification History

Not applicable.

Unit Descriptor

This unit covers the implementation of spontaneous combustion management plans in the coal industry. It includes identifying and applying resources to the spontaneous combustion management plan, implementing mine atmosphere monitoring measures, monitoring and responding to spontaneous combustion indicators, implementing spontaneous combustion control measures, and auditing spontaneous combustion control measures. Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

Application of the Unit

This unit is appropriate for those working in a management or supervisory role at worksites within:

- Coal mining

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify and apply resources to the spontaneous combustion management plan	1.1. Access, <i>interpret</i> and apply <i>compliance documentation</i> relevant to the work activity 1.2. Identify the risks and hazards associated with spontaneous combustion 1.3. Identify and implement appropriate response procedures in situations where trigger levels are reached 1.4. Encourage, receive, review and, where appropriate, implement suggestions and recommendations for changes to spontaneous combustion procedures 1.5. Implement the program to satisfy identified spontaneous combustion management plan training requirements
2. Implement mine atmosphere monitoring measures	2.1. Implement procedures for installation, operation and maintenance of monitoring systems 2.2. Implement systems and procedures for the collection of <i>mine gas</i> samples
3. Monitor and respond to spontaneous combustion indicators	3.1. Implement the system for identification of and inspections for spontaneous combustion indicators 3.2. Monitor <i>sensory spontaneous combustion indicators</i> analyse and investigate variations and implement appropriate corrective action and record and process reports in accordance with the plan 3.3. Monitor <i>gaseous spontaneous combustion indicators</i> analyse and investigate variations and implement appropriate corrective action and record and process reports in accordance with the plan 3.4. Implement emergency and evacuation procedures in accordance with the <i>safety management system</i>
4. Implement spontaneous combustion control measures	4.1. Implement ventilation control measures in accordance with the spontaneous combustion management plan 4.2. Implement ventilation monitoring systems and surveys to assess the status of the systems

	4.3. Incorporate into the development of the system water management measures to minimise the risk of spontaneous combustion 4.4. Implement <i>inertisation</i> as required and in accordance with the established plan 4.5. Implement <i>response actions</i> and review effectiveness and currency 4.6. Implement systems to prevent and/or respond immediately to the intersection of current and other workings
5. Audit spontaneous combustion control measures	5.1. Audit the effectiveness of <i>control measures</i> and amend the procedures/measures as required

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Specific skills are required to achieve the Performance Criteria of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes the ability to carry out the following, as required to implement the spontaneous combustion management plan:

- apply legislative, organisation and site requirements and procedures for implementing the spontaneous combustion management plan
- access, interpret and apply:
 - technical information
 - site / legislative requirements
 - records and reports
 - briefings and handover details
- prepare technical reports
- apply the principles of mine design
- assess the risks and consequences of spontaneous combustion
- develop procedures appropriate to mine operations for management of spontaneous combustion
- inspect, monitor, analyse and record data related to the management of spontaneous combustion
- plan and coordinate work
- identify training needs related to spontaneous combustion

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes knowledge of the following, as required to implement the spontaneous combustion management plan:

- causes and effects of spontaneous combustion
- the effects of coal seam characteristics, depositional factors and geological conditions on spontaneous combustion
- legislative and site requirements and instructions
- mine operation procedures
- geological data
- strata control
- mine design and plan relating to spontaneous combustion
- spontaneous combustion management plan requirements
- methods of control of spontaneous combustion
- principles of ventilation management

- gas management
- mine and goaf ventilation systems
- mine gases
- inertisation principles and techniques
- underground water management
- sealing design
- spontaneous combustion indicators and ratios
- spontaneous combustion risks and hazards
- environmental monitoring requirements
- risk management procedures
- site inspection requirements
- mine reporting procedures
- emergency and evacuation procedures

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following: • knowledge of the requirements, procedures and instructions for the implementation of the spontaneous combustion management plan • implementation of procedures and techniques for the safe, effective and efficient implementation of the spontaneous combustion management plan • the identification of the relevant information and scope of the work required to meet the required outcomes • the identification of viable options and the selection of spontaneous combustion management plan elements that best meet the required outcomes • working with other to undertake and complete the implementation of the spontaneous combustion management plan • consistent successful implementation of the spontaneous combustion management plan
Context of and specific resources for assessment	• This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • Assessment of this competency requires typical resources normally used in a resources and infrastructure sector environment. Selection and use of resources for particular worksites

	may differ due to the site circumstances. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity. • Aboriginal people and other people from a non English speaking background may have second language issues. • Where applicable, physical resources should include equipment modified for people with disabilities. Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods: • written and/or oral assessment of the candidate's required knowledge to apply in undertaking of the implementation of the spontaneous combustion management plan • observed, documented and/or first hand testimonial evidence of the candidate's: • implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes • identification of the relevant information and scope of the work required to meet the required outcomes • identification of viable options and the selection of spontaneous combustion management plan elements that best meet the required outcomes • consistent achievement of required outcomes • first hand testimonial evidence of the candidate's: • working with others to undertake and

	complete the implementation of the spontaneous combustion management plan • provision of clear and timely required support and advice on the implementation of the spontaneous combustion management plan
Guidance information for assessment	Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant compliance documentation may include:	• legislative, organisational and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
Interpret is defined as: the understanding needed by the person within their job role:	
Spontaneous combustion management plan may include procedures for:	• mine atmosphere monitoring • reporting requirements • auditing • ventilation systems and usage • inertisation techniques • mine plan • action plans • response plans • emergency procedures • individual group responsibilities • training and education procedures
Mine atmosphere refers to all areas in the general mine ventilation district and beyond into waste working and goafs / gobs in the mine.	
Sensory spontaneous combustion indicators may include:	• smoke • haze • sweating • smell • heat
Gaseous spontaneous combustion indicators may	• carbon monoxide • hydrogen

include reduced oxygen levels and/or increased production of:	- methane - higher hydrocarbons - Or the use of indicator ratios such as: - CO make - Graham's ratio - Tricketts - Morris' Oxides of Carbon ratio - other ratios included in the site safety management system
Control measures may include:	- coal stowage and transport procedures - procedures for responding to changes in atmosphere - mine atmosphere monitoring systems - procedures relating to the status of the ventilation system - sealing procedures - goaf monitoring systems - goaf sampling systems - spontaneous combustion inspection system
Inertisation may be defined as the displacing or reducing of oxygen to a level that will not support combustion. It may be either a natural process using seam gases or a process of introducing incombustible gases.	
Audit is defined as: <i>a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangement, and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives (AS/NZS 4804: 2001).</i>	
Action (alarm or trigger) level is a generic term used to describe a level determined at the mine site at which action is initiated or a response made.	
Principles of mine design	recovery

include:	• reserve optimisation • mining direction • geological structures • ventilation • strata control • mining method • productivity • environmental considerations and access • depth of cover • location of adjacent seams/workings
Hazards may include:	• irrespirable atmosphere • noxious atmosphere • flammable atmosphere • explosive mixtures • heatings • fires
Mine gases may include:	• seam gases • methane • carbon dioxide • oxides of nitrogen • hydrogen • carbon monoxide • sulphur dioxide • hydrogen sulphide • hydrocarbons • contaminations • normal atmosphere gases
Ventilation structures may include:	• stoppings • overcasts • regulators • preparation seals • fire doors • bulk heads • goaf seals • final seals • pressure chambers
Geological conditions may include:	• faults • dykes • intrusions • strata deformities
Coal seam characteristics may	• rank

include inherent factors such as:	• petrology • moisture content • particle size • seam gas • pyrites Or depositional factors such as: • seam thickness • multi seams • seam dip • depth of cover
Mine atmosphere monitoring may include:	• continuous monitoring • portable (hand held) monitoring • collection of bag samples • gas chromatography • ventilation measurements, including differential pressure across stoppings • seals and solid coal (intake to return) from all areas of the mine, including sealed areas • waste workings monitoring
Defects to ventilation structures may include:	• deterioration of materials • quality of construction • effects of surrounding strata • physical damage • water damage
Response actions for mitigation of spontaneous combustion may include:	• quenching • grouting • smothering • excavating • ventilation control by pressure balancing • sealing • inertisation

Unit Sector(s)

Coal Mining (Underground)

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.