



Australian Government

Department of Education, Employment and Workplace Relations

RIIMCU601A Establish and maintain the spontaneous combustion management plan

Release: 1

RIIMCU601A Establish and maintain the spontaneous combustion management plan

Modification History

Not applicable.

Unit Descriptor

This unit covers the establishment and maintenance of spontaneous combustion management plans in the coal industry. It includes identifying and clarifying spontaneous combustion hazards and risks, identifying and clarifying spontaneous combustion control systems and procedures, designing and developing the Spontaneous Combustion Management Systems, establishing the Spontaneous Combustion Management Plan, planning and preparing for the implementation of the Spontaneous Combustion Management Plan, and auditing and reviewing the Spontaneous Combustion Management Plan. 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 clarify spontaneous combustion hazards and risks	1.1. Identify the causes and hazards of <i>spontaneous combustion</i> 1.2. Identify and clarify <i>coal seam</i> characteristics which affect likelihood of <i>spontaneous combustion</i> 1.3. Identify and clarify the effects of changes in the <i>mine atmosphere</i> on the risks of <i>spontaneous combustion</i> 1.4. Identify the impact of mine design and <i>ventilation</i> on the risks of <i>spontaneous combustion</i> 1.5. Identify and clarify the impact of water accumulation on the risks of <i>spontaneous combustion</i> 1.6. Identify <i>spontaneous combustion</i> risks associated with the planned and unplanned coal accumulation 1.7. Identify <i>spontaneous combustion</i> risks associated with transport of coal
2. Identify and clarify spontaneous combustion control systems and procedures	2.1. Identify and evaluate the method, purpose and procedures for installation and use of mine monitoring systems with regard to <i>spontaneous combustion</i> 2.2. Identify and evaluate the method, purpose and procedures for mine design and <i>ventilation</i> systems with regard to <i>spontaneous combustion</i> 2.3. Identify and evaluate the methods and purposes of natural and induced <i>inertisation</i> in the goaf and waste workings, in relation to <i>spontaneous combustion</i> 2.4. Identify and clarify the scope and impact of gas management on <i>spontaneous combustion</i> 2.5. Identify and clarify the scope, impact and uses of water management, including water infusion on <i>spontaneous combustion</i> 2.6. Identify and clarify seal design requirements in terms of <i>geological structures</i> , construction, location and use of correct materials for the <i>spontaneous combustion</i> risks
3. Design and develop the	3.1. Access, interpret and apply <i>compliance</i>

spontaneous combustion management plan	documentation relevant to the work activity 3.2. Identify, clarify and apply the principles of mine design with respect to spontaneous combustion 3.3. Review the effectiveness of mine design process in contributing to the minimisation of the risk of spontaneous combustion and amend the processes as required 3.4. Incorporate ventilation systems and controls to minimise the risk of spontaneous combustion into the development of the management system 3.5. Evaluate inertisation options that are applicable to the mine and incorporate into the development of the system 3.6. Incorporate mine monitoring systems into the management system to minimise the risk of spontaneous combustion 3.7. Develop and incorporate control methods into contingency plans to mitigate the effect of a spontaneous combustion occurrence
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4. Establish the spontaneous combustion management plan	4.1. Establish and incorporate into the management plan spontaneous combustion management objectives, processes, descriptions, responsibilities and review procedures 4.2. Identify, develop and establish hazard control procedures associated with spontaneous combustion 4.3. Develop and establish spontaneous combustion management monitoring system installation, operation and maintenance procedures 4.4. Develop and establish ventilation control device installation, operation and maintenance procedures 4.5. Develop and establish inertisation procedures 4.6. Develop and establish spontaneous combustion management systems maintenance procedures 4.7. Develop and establish spontaneous combustion system information recording and reporting procedures 4.8. Establish and review trigger levels and responses to minimise the hazards of spontaneous combustion 4.9. Establish a program including systems and procedures, to satisfy identified spontaneous combustion management training requirements 4.10. Incorporate audit, review and updating procedures into the spontaneous combustion management plan
5. Plan and prepare for the implementation of the spontaneous combustion management plan	5.1. Identify and interpret the legislative and site requirements related to the spontaneous combustion management plan 5.2. Access, interpret and clarify the spontaneous combustion management plan 5.3. Identify, clarify and communicate to all personnel roles and responsibilities, as specified in the spontaneous combustion management plan 5.4. Identify, forecast, obtain and allocate/schedule resources required for the implementation of the spontaneous combustion management plan 5.5. Implement the spontaneous combustion

	training program 5.6. Encourage, receive, review and, where appropriate, implement suggestions and recommendations for changes to the spontaneous combustion management implementation procedures
6. Audit and review the spontaneous combustion management plan	6.1. Audit the operation of spontaneous combustion monitoring systems for compliance with legislative and gas management plan standards 6.2. Audit mine ventilation control devices for compliance with Audit legislative and mine site requirements 6.3. recording systems for compliance with the gas management plan 6.4. Audit the maintenance program and procedures for compliance with the spontaneous combustion management plan 6.5. Audit spontaneous combustion training program for currency, relevance and compliance with the requirements of spontaneous combustion management plan 6.6. Identify and correct non-compliance or other discrepancies/deficiencies revealed by audit

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 establish and maintain the spontaneous combustion management plan:

- apply legislative, organisation and site requirements and procedures for establishing and maintaining the spontaneous combustion management plan
- access, interpret and apply:
 - technical information
 - site/legislative requirements
 - records and reports
 - briefings and handover details
- 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
- 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 establish and maintain the spontaneous combustion management plan:

- causes and effects of spontaneous combustion
- the effects of coal seam characteristics on spontaneous combustion
- legislative and site requirements and instructions
- mine operation procedures
- geological data
- strata control
- mine design relating to spontaneous combustion
- spontaneous combustion management 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
- seal design and sealing procedures
- spontaneous combustion indicators and ratios
- site environmental monitoring requirements
- risk management procedures
- site legislative inspection requirements
- mine reporting 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 establishing and maintaining the spontaneous combustion management plan • implementation of procedures and techniques for the safe, effective and efficient establishment and maintenance 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 techniques that best meet the required outcomes • working with other to undertake and complete the establishment and maintenance of the spontaneous combustion management plan • consistent successful establishment and maintenance 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.
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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 establishment and maintenance 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 techniques 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 establishment and maintenance of the spontaneous combustion management plan • provision of clear and timely required support and advice on the establishment and maintenance 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
Coal seam characteristics may include inherent factors such as:	• rank • petrology • moisture • particle size • seam gas • Pyrites • depositional factors such as: • seam thickness • multi seams • seam dip • depth of cover
Mine atmosphere refers to all areas in the general mine ventilation district and beyond into waste working and goafs/gobs in the mine.	
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.	
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.	
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Principles of mine design may include:	• recovery • reserve optimisation • mining direction • geological structures • ventilation • strata control • mining method • productivity • environmental considerations and access • depth of cover • location of adjacent seams • location of adjacent workings
Control methods are processes for the mitigation of spontaneous combustion and may include:	• quenching • grouting • smothering • excavating • ventilation control by pressure balancing • sealing • water injection
Hazards may include:	• irrespirable atmosphere • noxious atmosphere • flammable or explosive mixtures
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
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</i>	

<i>objectives</i> (AS/NZS 4804: 2001).	
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Mine gases may include gases such as:	• methane • carbon dioxide • hydrogen sulphide • normal atmosphere gases • other gases produced from the processes of heating coal
Ventilation control devices 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
Mine atmosphere monitoring may include:	• continuous monitoring • portable (hand held) monitoring • collection of bag samples • gas chromatography • differential pressure measurements across stoppings, seals, solid coal (intake to return) • ventilation measurements from all areas of the mine including sealed areas, waste workings • thermographic monitoring
Sensory spontaneous combustion indicators may include:	• smoke • haze • sweating • smell • heat
Gaseous spontaneous combustion indicators may include increased production of:	• carbon monoxide • carbon dioxide • methane • hydrogen • hydrocarbons or the use of indicator ratios such as: • CO make • Graham's ratio

	• Tricketts • Morris' Oxides of Carbon ratio • other ratios as determined suitable
Defects to ventilation structures may include:	• deterioration of materials • quality of construction • effects of surrounding strata • physical damage • water damage
Control measures may include:	• removal of coal accumulation • modification of 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

Unit Sector(s)

Coal Mining (Underground)

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.