



Australian Government

Department of Education, Employment and Workplace Relations

RIIRAI604A Establish and maintain mine services and infrastructure systems

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers establishing and maintaining mine services and infrastructure systems in underground coal mines. It includes: designing mine services and infrastructure systems; selecting plant, equipment or services; establishing installation and commissioning systems and procedures; establishing management systems for the operation and maintenance of plant, equipment or services; planning and preparing for the implementation of mine services and infrastructure; and establishing management systems to audit and review mine services and infrastructure systems.

Application of the Unit

This unit is appropriate for those working in a management role or as a technical specialist, 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. Design mine services and infrastructure systems	1.1. Access, interpret and apply compliance documentation relevant to establishing and maintaining mine services and infrastructure systems 1.2. Identify the requirements for and purpose of mine services and infrastructure systems in accordance with legislative requirements and the system of mining 1.3. Establish specifications for the mine services and infrastructure systems from a comprehensive analysis of operating requirements 1.4. Identify options from an analysis of all relevant technical, operational and financial information 1.5. Select the preferred systems options on the basis of performance against specification requirements 1.6. Assess potential locations for mine services and infrastructure by site inspection, locate on mine plan and confirm location
2. Select plant, equipment or services	2.1. Identify the requirements for, and purpose of plant, equipment and services against systems requirements 2.2. Conduct a detailed scoping of the operational requirement and develop key selection criteria, including hazard identification and risk analysis 2.3. Establish specifications for the required plant, equipment and services 2.4. Select the preferred plant, equipment and services options on the basis of performance against specification requirements
3. Establish installation and commissioning systems and procedures	3.1. Establish a system to identify hazards and analyse and evaluate risks associated with the installation of plant, equipment and services 3.2. Plan and prepare for integration of new and existing systems and procedures to achieve optimum performance 3.3. Establish procedures for installing and commissioning plant, equipment and

	services 3.4. Establish systems and procedures to satisfy identified training requirements
4. Establish management systems for the operation and maintenance of plant, equipment or services	4.1. Establish operational procedures for plant, equipment and services from site and legislative requirements and incorporate into site documentation 4.2. Establish maintenance procedures for plant, equipment and services from site and legislative requirements and incorporate into site documentation 4.3. Establish procedures for reviewing and modifying work processes 4.4. Establish the maintenance of emergency response and evacuation plant, equipment and services in accordance with site requirements 4.5. Establish the system for recording and reporting of plant, equipment and services information
5. Plan and prepare for the implementation of mine services and infrastructure	5.1. Identify and interpret the legislative and site requirements related to the implementation of mine services and infrastructure systems 5.2. Identify, clarify and communicate to all personnel roles and responsibilities, related to the implementation of mine services and infrastructure systems 5.3. Identify, forecast, obtain and allocate/schedule resources required for the implementation of mine services and infrastructure systems 5.4. Implement mine services and infrastructure systems training program 5.5. Encourage, receive, review and, where appropriate, implement suggestions and recommendations for changes to mine services and infrastructure systems and implementation procedures
6. Establish management systems to audit and review mine services and infrastructure systems	6.1. Establish procedures to audit and review equipment compliance in accordance with legislative and site requirements 6.2. Identify and assess future plant, equipment and services requirements into the planning processes 6.3. Establish procedures to audit and review the currency and compliance of operation

	and maintenance systems relating to plant, equipment and services 6.4. Establish procedures to audit the training programs for currency and relevance 6.5. Establish procedures for incorporating feedback into the audit/review system 6.6. Establish procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit
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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 in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to establish and maintain mine services and infrastructure systems:

- apply legislative, organisation and site requirements and procedures
- access, interpret and apply:
 - technical information
 - site / legislative requirements
 - records and reports
 - briefings and handover details
- apply the principles of mine design
- apply hazard identification and risk management processes
- apply work planning and coordination procedures
- apply training needs analysis
- interpret and apply manufacturers' instructions

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following, as required to establish and maintain mine services and infrastructure systems:

- legislative and site-specific requirements for mine services and infrastructure
- emergency response and disaster planning processes and techniques
- audit review process and techniques
- mine operating procedures for mine services and infrastructure
- mine design relating to mine services and infrastructure
- energy sources including protection and reticulation systems for electrical, hydraulic, compressed air, diesel
- safety design features of mine services and infrastructure
- a basic knowledge of computer based systems related to the monitoring and operation of mine services and infrastructure
- training programs
- fire fighting systems
- safety design features for maintenance of mine services and infrastructure
- stores systems
- specifications for fixed plant and infrastructure

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 mine services and infrastructure systems • implementation of procedures and techniques for the safe, effective and efficient establishing and maintaining of mine services and infrastructure systems • the identification of the relevant information and scope of the work required to meet the required outcomes • the identification of viable program options and the selection of programs that best meet the required outcomes • working with others to establish and maintain mine services and infrastructure systems • consistent and timely completion of the establishing and maintenance of mine services and infrastructure systems
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. • 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. • Assessment of this competency requires typical resources normally used in a civil works environment. Selection and use of resources for particular worksites may differ due to site circumstances. • 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 • observed, documented and/or first hand testimonial evidence of the candidate's: • implementation of appropriate procedures and techniques for the safe, effective and efficient achievement of the required outcomes • identification of the relevant information and scope of the work required • identification of viable options and the selection of options that best meet the required outcomes • consistently achieving the required outcomes • first hand testimonial and documentary evidence of the candidate's: • working with others to establish and maintain mine services and infrastructure systems • consistent and timely gaining of approval of mine services and infrastructure systems • provision of clear, timely required support and advice on the implementation of mine services and infrastructure systems
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, organisation and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • code of practice • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
Mine services may include, but not be limited to:	• water • wastewater • compressed air • fire fighting • gas drainage • fuel • electrical reticulation • waste disposal • condition monitoring • communication • stone dust handling systems • mine refrigeration systems • sewerage handling systems
Infrastructure refers to fixed plant and equipment which may include:	• fabrication and construction areas • servicing areas • re-fuelling points • workshops • dams • explosives magazines • training facility • bathrooms • HV switch rooms • lamp cabin • laboratory • storehouses

	• equipment storage areas • on site residential housing • site access (road, rail, air) • battery rooms • water treatment plant • sewerage treatment plant • offices • emergency facilities (First Aid, fire) • coal preparation plant • stockpile and coal load out • lathes • presses • gantry cranes • drills • grinders • service bays • testing rooms • process treatment plant • conveyor systems • pumps and stations • pipelines • ventilation fans • compressors • winders • haulage winches • battery chargers • air conditioning • generators • electrical switching/control/distribution equipment • gas plant
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Specifications may include, but are not limited to:	• performance requirements • costs • dimensions • capacity • OHS requirements • training requirements • key selection criteria
Hazard is defined as:	• a source of potential harm or a situation with a potential to cause loss
Risk is defined as:	• the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood
Systems and procedures may include:	• design • development • establishment • installation • operations • protection • maintenance • monitoring • recording • reporting process
Standard operating procedures (SOP) are:	• also known as safe working procedures, safe operating procedures and standard working procedures
Site documentation and training policy may include, but not be limited to:	• legislative requirements • management plans and procedures
Maintenance may be divided into:	• predictive • preventative • breakdown
Recording and reporting systems include site requirements and consist of:	• phones • radios • computer systems • verbal and written
Site requirements may contain:	• legislation, including, but not limited to • mine plans, electric rules, gas drainage, compressed air, electrical / mechanical equipment, inspection requirement, environmental management, explosion barriers, communication, emergency procedures, risk management, recording and reporting, mines

	rescue, OHS, manufacturer instructions, standard work procedures, training and fire fighting, handling and storage of dangerous goods, local government and power authority requirements • relevant Australian standards • safety management plans • OHS policy • code of practice • industry guidelines • approved standards • manufacturer instructions • standard operating procedures (or equivalent) • industry guidelines
Safety systems may include, but are not limited to:	• legislation (legal requirements) • location of components in protection system • specific hazard management (e.g. spontaneous combustion, gas, noise, water, heat, dust) • protection systems (guarding, fire protection and suppression, electricity, lighting arresters, ventilation in explosives magazines and earthing)
Audit is defined as:	• 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

Unit Sector(s)

Resources and Infrastructure

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.