



Australian Government

Department of Education, Employment and Workplace Relations

RIIRAI605A Establish and maintain an underground mine mechanical plant management system

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers C mechanical plant management systems in underground coal mines. It includes: identifying, analysing and evaluating hazards and risks associated with the use of mechanical equipment in an underground coal mine; identifying, analysing and evaluating hazards and risk control options and measures; establishing the mine mechanical plant management system; implementing the mechanical plant management system; and auditing and reviewing the system.

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. Identify, analyse and evaluate hazards and risks associated with the use of mechanical equipment in an underground coal mine	1.1. Access, interpret and apply compliance documentation relevant to establishing and maintaining underground mine mechanical plant management systems 1.2. Identify, evaluate and clarify mine conditions which contribute to explosive atmospheres 1.3. Identify, evaluate and clarify conditions which contribute to flammable environments 1.4. Identify, evaluate and clarify hazards caused by disruption to the mine ventilation system 1.5. Identify, analyse and evaluate hazards and risks relating to mechanical plant
2. Identify, analyse and evaluate hazards and risk control options and measures	2.1. Identify, analyse and evaluate explosion protection control techniques for mechanical equipment 2.2. Identify, analyse and evaluate fire protection and prevention methods and systems on mechanical equipment 2.3. Identify, analyse and evaluate methods and systems to control engine pollutants from mechanical equipment 2.4. Identify, analyse and evaluate methods and systems to control hazardous substances initiated from or used by mechanical equipment 2.5. Develop systems to maintain the integrity of safety critical functions of mechanical equipment 2.6. Develop systems to control hazards for energy dissipation and isolation systems on mechanical equipment 2.7. Develop systems to control hazards in lifting and towing systems for mechanical equipment 2.8. Develop systems to protect people in their interrelationship with mechanical equipment in the underground environment 2.9. Develop systems to prevent failure of winding and personnel transport equipment 2.10. Evaluate the uses of mine

	monitoring and information systems to control hazards and risks on mechanical equipment
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3. Establish the mine mechanical plant management system	3.1. Access, interpret and clarify the legislative and site requirements related to mechanical plant and equipment 3.2. Establish mechanical plant objectives, systems, descriptions and responsibilities and incorporate into the mechanical plant management system 3.3. Consult with relevant stakeholders in the development of the mechanical plant management system 3.4. Design mechanical plant management systems to satisfy the operational systems and conditions of the mine 3.5. Incorporate maintenance and inspections systems to ensure the equipment is safe to operate 3.6. Incorporate systems to monitor and test the performance of safety critical functions on mechanical plant and equipment 3.7. Incorporate systems to control noise, dust, other emissions and other hazardous substances 3.8. Incorporate systems to develop safe work procedures 3.9. Incorporate systems for the management of mechanical contractors 3.10. Develop and establish mechanical engineering standards 3.11. Develop and establish mechanical equipment information recording and reporting procedures, including defect reporting and rectification 3.12. Establish a program, including systems and procedures, to satisfy mechanical equipment training requirements 3.13. Incorporate audit and review requirements and update procedures into the mine mechanical plant management system.
4. Implement the mechanical plant management system	4.1. Identify, forecast, obtain and allocate/schedule resources required for the implementation of the mechanical plant management system 4.2. Communicate to all personnel, including contractors, roles and responsibilities, as specified in the mechanical plant

	management system 4.3. Implement the mechanical plant training program 4.4. Consult with relevant stakeholders and implement changes to mechanical plant management system
5. Audit and review the mechanical plant management system	5.1. Audit mine mechanical engineering standards for compliance with statutory and mine site requirements 5.2. Audit mine mechanical equipment monitoring systems operations for compliance with statutory and mine site requirements 5.3. Audit the maintenance program and procedures for compliance with the Mechanical Plant Management System and statutory requirements 5.4. Audit recording and reporting systems for compliance with the Mechanical Plant Management System 5.5. Audit mechanical plant management training program for currency, relevance and compliance with the requirements of the Mechanical Plant Management System 5.6. Establish procedures for non-compliances revealed by audit and modify the management plan where appropriate 5.7. Review the Mechanical Plant Management System

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 an underground mine mechanical plant management system:

- 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 manufacturer instructions
- apply effective communication techniques
- access, evaluate and apply data from monitoring systems and equipment

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 an underground mine mechanical plant management system:

- legislative and statutory requirements for mechanical plant and equipment
- the emergency response and disaster planning processes and techniques
- audit review processes and techniques
- mechanical engineering standards
- safety critical function of mechanical equipment
- mine operating procedures for mechanical plant and equipment
- mine design relating to mechanical plant and equipment
- options to prevent failure of winding and personnel transport equipment
- options to control hazards and risks relating to mine mechanical plant and equipment, including explosion protection, fire protection and prevention, lifting and towing systems, hazardous substances and the interrelationship between people and mechanical equipment
- energy sources, including protection and reticulation systems for electrical, hydraulic, compressed air, diesel

- mine fires; the types, sources of ignition and possible impacts on plant and equipment
- a basic knowledge of computer based systems relating to the monitoring, and operation of mine mechanical plant and equipment
- fire fighting systems
- specification for mine plant and equipment

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 establishing and maintenance of an underground mine mechanical plant management system • implementation of procedures and techniques for the safe, effective and efficient completion of the establishing and maintenance of an underground mine mechanical plant management system • 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 an underground mine mechanical plant management system • consistent and timely establishing and maintenance of an underground mine mechanical plant management system
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 an underground mine mechanical plant management system • consistent and timely gaining of approval of an underground mine mechanical plant management system • provision of clear, timely required support and advice on the implementation of an underground mine mechanical plant management system
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
Mechanical plant management system establishes procedures for maintaining safe equipment including:	• hazard identification and quantification • risk management • consultation • authority and responsibility • controls established to manage identified risks • reporting and communication • document control • audit and review
Flammable environment may include but is not limited to:	• coal storage bins • reclaim tunnels • confined spaces • gases • dust • restricted work area • flammable environments, i.e. those related to heat sources, fuel sources and ignition sources
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
Hazards and risks to be identified, analysed and clarified in the MPMS include:	• explosion initiated from mechanical equipment • fire initiated and/or supported by mechanical equipment

	• hazardous substances used for mechanical equipment • toxic substances generated by mechanical equipment • the release of uncontrolled kinetic energy (unplanned movements) on mechanical equipment • the interaction and/or failure of transport and production equipment • the use and storage of high pressure fluids • moving and rotating parts on mechanical equipment • fluid injection incidents • dangerous goods e.g. LPG, flammable liquids • strata failure
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Interrelationship with mechanical equipment in the underground environment may include:	• access systems • guarding • remote and/or automatic control • restricted working areas • safe standings/operating zones • ergonomics and vibrations • vision • manual handling • working at heights • emergency egress systems
Hazards associated with transport equipment and other plant may include:	• tyre and rim failure • interaction between vehicles • restricted vision and clearance • power reticulation
Operational systems and conditions may include but are not limited to:	• methods of mining (e.g. longwall, place change, bord and pillar) • weather • grades • water • drilling and explosives • road and rail design • dredging and pumping • electrical reticulation • productivity • environmental considerations • coal preparation and handling • methane drainage
Safe work procedure will include, but is not limited to:	• cutting and welding in underground coal mines • energy isolation and dissipation • confined spaces
Engineering standards may include but are not limited to:	• mechanical plant maintenance procedures • system for the modification and rectification of mechanical equipment • systems for erection of plant
Training applies to:	• mine workers • tradespeople • permanent employees • contractors • mine officials • other special requirements

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
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Unit Sector(s)

Resources and Infrastructure

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.