



Australian Government

RIIRAI609D Establish and maintain electrical installations, reticulation and protection system

Release: 3

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Modification History

Release	Comment
1	This unit replaces RIIQAI609A Establish and maintain electrical installations, reticulation and protection system
2	Plan and Prepare element added.
3	Required frequency and volume of evidence amended in Performance evidence. Substantial amendments made in Assessment Conditions field, including: references to Industry Sectors, assessor and subject matter expert experience requirements, how assessment should be conducted and what it should confirm.

Application

This unit develops a participant's skills and knowledge required to establish and maintain electrical installations, reticulation and protection systems in Coal mining.

This unit is appropriate for those working in management or technical specialist roles.

No licensing, legislative or certification requirements apply to this unit at the time of publication

Unit Sector

Coal mining

Elements and Performance Criteria

1. Plan and prepare for electrical installations, reticulation and protection	1.1 Access, interpret and apply electrical installations, reticulation and protection system documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work requirements 1.3 Identify and address potential risks, hazards and environmental issues and implement control measures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Identify design/selection specifications and critical aspects of
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	the systems from a comprehensive analysis of operating requirements 1.6 Identify systems options from an analysis of all relevant technical, operational and financial information 1.7 Select the preferred systems options on the basis of performance against specification requirements
2. Provide power supply systems for the mine site	2.1 Install, maintain, review and modify mine power supply systems 2.2 Undertake processes and procedures and ensure reliability and quality of supply taking into account transients, harmonics, over-voltages, voltage regulation, lightning and stray currents 2.3 Plan and install alternative power supply associated with mine site conditions and safety needs 2.4 Undertake processes and procedures to protect high energy sources (sub stations and transformers) through the selection and installation of switchgear and protective devices 2.5 Provide mine illumination systems and equipment 2.6 Plan and install battery and associated charging equipment 2.7 Review, audit, report and maintain all power supply systems
3. Provide electrical protection system for mine sites	3.1 Access, interpret and apply the compliance documentation requirements related to mine electrical protection system 3.2 Install and maintain the electrical protection system 3.3 Identify, isolate, rectify faults in electrical installations and verify ability of the system through recognised decision-making processes, including the use of fault level calculations, discrimination and component ratings 3.4 Apply management decision-making processes for the maintenance, examination and testing of electrical protection systems relative to mine site and safety needs 3.5 Review, modify, audit and maintain all electrical protection systems and devices
4. Provide cables from power source to point of usage	4.1 Access, interpret, apply and implement the compliance documentation requirements related to provision and use of mine cables 4.2 Identify, select and install mine cables 4.3 Identify, report and rectify mine cable faults and hazards in accordance with mine site and hazard control requirements 4.4 Inspect mine cables for their integrity, usage, consequence of fault/damage and previous repairs

	4.5 Carry out management, inspection, application, testing, fault finding and repair
5. Provide mobile machinery and electrical apparatus	5.1 Access, interpret, clarify and apply the compliance documentation requirements related to provision and use of mobile machinery and electrical apparatus 5.2 Identify, select and install mobile machinery and electrical apparatus 5.3 Inspect, monitor, report and rectify mobile machinery and electrical apparatus faults and hazards 5.4 Carry out testing
6. Provide overall electrical services that apply to production systems	6.1 Access, interpret, clarify and apply the compliance documentation requirements related to overall electrical services that apply to production systems 6.2 Select, install, monitor and maintain mine communication systems 6.3 Select, install, monitor, modify and maintain the electrical components of the gas monitoring and detection systems 6.4 Select, install, monitor, modify and maintain control systems 6.5 Control, monitor and rectify electromagnetic interference that may affect the safe use of electrical systems and other mining equipment 6.6 Select, install, monitor, modify and maintain remote control systems on mining equipment 6.7 Select, install, monitor, modify and maintain welding equipment and energy delivery sources, including pre and post operations 6.8 Identify, control and manage hazards from electrostatic charges
7. Provide safe electrical work procedures	7.1 Access, interpret, clarify and implement the compliance documentation requirements related to safe electrical work procedures 7.2 Monitor and audit safe electrical work procedures 7.3 Determine and implement training needs

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

Unit Mapping Information

No equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272>

Assessment Requirements for RIIRAI609D Establish and maintain electrical installations, reticulation and protection system

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Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant legislation, documentation, policies and procedures
- implements procedures and techniques for the safe, effective and efficient completion of the establishing and maintenance of mine electrical installations, reticulation and protection systems including:
 - accessing, interpreting and applying legislative, organisation and site requirements and procedures
 - accessing, interpreting and applying:
 - technical information
 - records and reports
 - applying the principles of electrical installations, reticulation, control and protection system theory
 - applying procedures for the evaluation of designs and installations of electrical installations, reticulation, control and protection systems at a mine in terms of safety requirements
 - applying risk management processes for the risks associated with and consequences of failure of electrical installations, reticulation, control and protection systems at a mine

- applying risk management processes for the risks associated with and consequences of changes to electrical installations, reticulation, control and protection systems at a mine
- applying development procedures, for the management, operation, testing and maintenance of the mines electrical installations, reticulation, control and protection systems
- applying procedures for the planning, coordination and documentation of work on the mines electrical installations, reticulation, control and protection systems
- applying training needs analysis
- works effectively with others to establish and maintain mine electrical installations, reticulation and protection systems including:
 - managing people and processes
 - resolving conflict
 - coordinating human, financial and physical resources
 - developing, initiating and administering work plans
 - interpreting and applying operational performance data
 - engaging internal and external stakeholders
- demonstrates completion of the establishing and maintenance of mine electrical installations, reticulation and protection systems that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
 - identifying the relevant information and scope of the work
 - identifying the full range of specification requirements
 - identifying all aspects of mine power supply systems
 - identifying options for power supply systems, electrical protection systems, and cables from power source to point of usage

Knowledge Evidence

The candidate must demonstrate knowledge of the in establishing and maintaining electrical installations, reticulation and protection systems through:

- legislative, organisation and site requirements and procedures for;
 - inspections and reporting
 - hazards associated with high energy systems in mining
- electrical protection theory, including earthing systems, coordination and fault level calculations, step and touch potential management
- fault discrimination and fault clearance characteristics of equipment
- mining electrical protection systems, including earth continuity monitoring, earth leakage protection, earth fault current limitation and relevant standards
- typical low and high voltage switching and distribution systems on mines
- transient over-voltages, harmonics and lightning theory, hazards and protection schemes

- mining cables, faults and consequences, cable protection systems, standards and cable repair
- classification of hazardous areas and explosion-protected electrical equipment principles, general requirements, verification, testing and standards
- automatic control system hazards, protection schemes and standards
- electromagnetic interference hazards, protection schemes and standards
- management and control of processes for change to software and hard wired based systems
- electromagnetic interference hazards, protection schemes and standards
- radio remote control systems hazards, protection schemes and standards
- safety protective devices associated with welding machines such as Voltage Reducing Devices
- the principles of electrical installations, reticulation, control and protection system theory
- the risks associated with and consequences of failure of electrical installations, reticulation, control and protection systems at a mine
- the risks associated with and consequences of changes to electrical installations, reticulation, control and protection systems at a mine

Assessment Conditions

- An assessor of this unit must satisfy the requirements of the NVR/AQTF or their successors; and Industry regulations for certification and licensing; and,
- this unit must be assessed in the context of this sector's work environment; and,
- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other Units of Competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this Unit of Competency, and through the minimum years of current* work experience specified below in an Industry sector relevant to the outcomes of the unit; or,
- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an Industry subject matter expert. The Industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An Industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the Industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and Industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or Industry Sector as follows:

Industry sector	AQF** Level	Required assessor or Industry subject matter expert experience
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years
Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 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.	

*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 frequent site assessments across various locations.

**Where a unit is being delivered outside of a Qualification the first numeric character in the Unit code should be considered to indicate the AQF level

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