



Australian Government

UEERS0027 Maintain computer-based interlocking rail systems

Release: 1

UEERS0027 Maintain computer-based interlocking rail systems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

This unit replaces and is equivalent to UEERS0006 Install and maintain computer based interlocking rail systems.

Modifications this release include:

- Title changed.
- Application updated to reflect title change.
- Element titles and performance criteria amended to reflect title change.
- Performance criteria 1.6, 2.2, 3.2 and 3.3 added.
- Performance and Knowledge Evidence updated for clarity.
- Knowledge Evidence items added.

Application

This unit involves the skills and knowledge required to maintain computer-based interlocking equipment for rail network signalling system.

It includes preparing, maintaining and recertifying computer-based interlocking (CBI) equipment. It also includes completing maintenance of CBI systems and replacing faulty equipment requirements.

Persons achieving competence in this unit will need to fulfil the applicable state/territory legislated rail safety requirements and comply with relevant codes of practice, rules and/or guidelines.

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

Pre-requisite Unit

UEERS0025 Maintain active level crossing equipment

UEERS0030 Maintain power-operated point actuating devices

UEERS0032 Maintain trackside signal and train protection equipment

Competency Field

Rail Signalling

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Prepare to maintain CBI rail equipment

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for a given work area are identified, obtained and clarified
- 1.2** Hazards are identified, WHS/OHS risks assessed, and control measures and workplace procedures are implemented in preparation for work
- 1.3** Scope of maintenance work is determined from job specifications, drawings and regulatory requirements
- 1.4** The version of the signalling data and executive software of the CBI is identified by reference to the engineering records
- 1.5** Materials needed for the maintenance work are obtained in accordance with workplace procedures and checked against job specifications
- 1.6** Tools, equipment and testing devices needed for maintenance work are obtained in accordance with workplace procedures and checked for correct operation and safety
- 1.7** Authorisation to take temporarily out of service or disable systems is obtained in accordance with workplace procedures

2 Maintain CBI rail system

- 2.1** WHS/OHS risk control measures and workplace procedures for carrying out the work are followed
- 2.2** On-track safe working requirements are identified and applied in accordance with workplace procedures and safety management system
- 2.3** Reports or fault logs are identified and accessed

- 2.4** Fault correction activities are prioritised by reviewing the fault reports and previous corrective actions
- 2.5** Records of previously corrective actioned faults are managed
- 2.6** Source of the fault is identified
- 2.7** Corrective action required is determined and implemented
- 2.8** Checking that the CBI has the correct version of the signalling data and software is completed
- 2.9** System is checked for the correct version of signalling data and software if applicable part of the CBI equipment is replaced
- 2.10** Appropriate mechanisms for the safe and efficient rectification of the fault are determined
- 2.11** Methods for dealing with unplanned situations are determined on the basis of safety and specified work outcomes
- 2.12** Rail system monitoring is conducted efficiently, without waste of materials or damage to apparatus, the surrounding environment or services using sustainable energy practices
- 2.13** Replacement equipment is obtained from spare stock as required to comply with identified fault repair requirements
- 2.14** Faulty component/equipment is identified and removed as required in accordance with organisation practices and procedures
- 2.15** Replacement component/equipment is installed and connected to power in accordance with manufacturer specifications
- 2.16** Correct test procedures are identified and implemented to confirm all operations are within specifications
- 2.17** Equipment operations are monitored to ensure system integrity
- 2.18** Signal and voltage levels are monitored, checked and adjusted, as required, in accordance with operational

requirements

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|---|-------------|--|
| | 2.19 | Completed records and equipment/operational management information are accurately recorded and maintained to support ongoing monitoring of systems and equipment performance |
| 3 Complete CBI rail system maintenance | 3.1 | WHS/OHS risk control work completion measures and workplace procedures are followed |
| | 3.2 | Confirmation that system is functional and that no alarms are present or indicated |
| | 3.3 | On-track safe working requirements are removed in accordance with workplace procedures and safety management system |
| | 3.4 | Non-conforming equipment is identified and tagged for repair type and extent of fault is identified and recorded, as required |
| | 3.5 | Faulty equipment requiring repair is segregated as required and appropriate records are completed in preparation for despatching to repairer |
| | 3.6 | Spare equipment stocks are reviewed to ensure adequate availability |
| | 3.7 | Priority for repair and/or replacement of equipment is determined in consultation with authorised person by evaluation of stock levels and fault logs |
| | 3.8 | Work completion is documented and appropriate person/s notified of repair and replacement priorities in accordance with workplace procedures and relevant reports produced |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package

Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEERS0006 Install and maintain computer based interlocking rail systems.

Links

Companion Volume Implementation Guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEERS0027 Maintain computer-based interlocking rail systems

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- Knowledge Evidence items added.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least one occasion and includes:

- following relevant codes of practice, work health and safety (WHS)/occupational health and safety (OHS) and environmental protection procedures requirements
- implementing workplace procedures and practices
- applying rail safe working practices and relevant industry standards, codes and rail safety regulations
- applying sustainable energy principles and practices
- interpreting specifications and plans correctly
- using appropriate testing and fault-finding techniques
- maintaining computer-based interlocking equipment to operational requirements, plans and specifications
- rectifying faults with minimal disruption to rail traffic and services
- using tools and test equipment correctly
- completing maintenance of computer-based interlocking (CBI) system
- maintaining CBI system
- dealing with unplanned events
- completing relevant technical reports, records and documentation.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of

the requirements of the elements and performance criteria and include knowledge of:

- interlocking operating principles and parameters including:
 - normal mode operation
 - route selection logic
 - signal approach logic and timers
 - point release logic and timers
 - panel displays and logic
 - wrong-side protection mode
 - alarm mode
 - use of control tables
 - relay interfaces
 - emergency operation
 - correct operation in accordance with control and locking tables
- electronic communications, principles including:
 - requirements of a basic communications system
 - simple transmitter and receiver circuits (block diagram level)
 - optical communications principles
- rail signalling - electronic equipment including:
 - equipment and their components
 - operating principles and parameters
 - servicing procedures
- rail signalling - CBI including:
 - equipment and their components
 - operating principles and parameters
 - servicing procedures
- rail signalling - computer applications including:
 - types of software and their scope - interrogator software for loggers, monitors and CBI and database
 - setting up and use
- serial communications
- importance of cyber security for the signalling asset
- internet protocol including:
 - set an IP address
 - visual diagnostics
 - web interface diagnostics
 - upgrading/downgrading firmware
 - uploading/downloading configuration file
- signaller controls/indications
- servicing procedures including:
 - maintenance documentation

- coordination/planning sequence
- operational test procedures
- scheduled/preventative maintenance
- unscheduled/corrective maintenance
- certifying interlocking equipment
- rail signalling, drawings and diagrams
- drawing types and applications encompassing:
 - drawing layouts and conventions
 - drawing symbols
 - cable and equipment schedules
- certifying procedures applicable for compliance with rail operator and/or enterprise standards
- relevant manufacturer specifications and manuals.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in suitable simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, facilities, equipment and personal protective equipment (PPE) currently used in industry
- resources that reflect current industry practices in relation to maintaining computer-based and SSI systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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