



Australian Government

Assessment Requirements for UEERS0012

Install and maintain trackside signal and train protection equipment

Release: 1

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Modification History

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

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 include:

- interpreting specifications and circuit diagrams correctly
- using appropriate fault-finding techniques
- installing/maintaining trackside signal and train protection equipment to operational requirements
- organising work to minimise traffic disruptions
- using tools and test equipment correctly
- following relevant codes of practice and environmental protection procedures and requirements
- completing relevant technical reports and documentation
- dealing with unplanned events
- applying rail safe working practices and relevant industry standards, codes and rail safety regulations
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - implementing workplace procedures and practices
 - using risk control measures
- applying sustainable energy principles and practices
- completing installation/maintenance of trackside signal and train protection equipment.

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:

- trackside signal and train protection equipment installation/maintenance, safe working practices and relevant standards, codes and regulations, including:
 - rail signalling principles - electrical
 - overview of electrical rail signalling encompassing:
 - types of rail signalling/safe working systems including computer-based interlocking (CBI), automatic, controlled and interlocked signalling

- advantages of electrical over mechanical signalling
- advantages of CBI over electrical signalling systems
- effects of overhead traction systems on electrical signalling systems (where applicable)
- purpose of elements of an electrical rail signalling system, including signals and aspect systems, train protection systems, point actuating systems, mechanical locking, relay interlocking, CBI, train detection systems, control input devices, indicators, diagrams and monitors, and safe working systems
- rail signalling principles - mechanical
- overview of mechanical rail signalling encompassing:
 - types of mechanical rail signalling systems for different rail traffic, including passenger train, freight train, maintenance vehicles and heritage/tourism train
 - deficiencies of mechanical signalling systems, including automatic, controlled and interlocked signalling
 - effects of overhead traction systems on mechanical signalling systems (where applicable)
 - effects of external factors on the mechanical rail signalling system, including rail overhead, gradients/terrain, environmental and civil configuration
- purpose of elements of a mechanical rail signalling system encompassing:
 - signals, point actuating systems, locking and train detection systems, control input devices, indicators, diagrams and monitors, mechanical interlocking frames, safe working systems and electro-mechanical interfaces
 - rail signalling and signal equipment
- equipment and their components encompassing:
 - incandescent lamps
 - light-emitting diode (LED) lamps
 - electro-mechanical
 - mechanical
 - interfacing to different interlocking systems, e.g. relay and CBI
- operating principles and parameters encompassing:
 - automatic signal control circuits
 - controlled signal control circuits
 - approach control circuits
 - bi-directional block control circuits
 - lamp proving circuits
 - failure mode
 - interpreting circuits diagrams to evaluate correct operation and relationship to other signalling circuits
 - correct operation in accordance with control and locking tables
- servicing procedures encompassing:
 - maintenance documentation

- coordination/planning sequence
- operational test procedures
- scheduled/corrective maintenance
- unscheduled/preventative maintenance
- certifying signal equipment (commission and de-commission)
- certifying procedures applicable for compliance with rail operator/enterprise standards
- rail signalling, train protection equipment
- equipment and their components encompassing:
 - electro-mechanical (e.g. train-stops)
 - electro-magnetic (e.g. automatic warning system (AWS))
 - electronic (e.g. train protection warning system (TPWS))
 - automatic train protection (ATP) system - Balise/beacon based (e.g. ETCS level 1, and Westect)
- operating principles encompassing:
 - permissive operation
 - restrictive operation
 - failure modes
 - interpreting circuits diagrams to evaluate correct operation and relationship to other signalling circuits
 - correct operation in accordance with control and locking tables
- safe working practices and relevant standards, codes and regulations
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace policies and procedures.

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 installing/maintaining trackside signal and protection equipment
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

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