



Australian Government

UEERS0020 Apply rail signalling principles

Release: 1

UEERS0020 Apply rail signalling principles

Modification History

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

Application

This unit involves the skills and knowledge required to interpret and apply rail signalling principles.

It includes identifying signalling equipment, explaining signalling terminology and conventions and explaining railway signalling principles. It also includes the interpretation of key signalling design documents as well as applying health and safety legislative requirements to different signalling work.

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

Not applicable

Competency Field

Rail Signalling

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Identify health and safety

PERFORMANCE CRITERIA

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

1.1 Basic roles, responsibilities and rights of rail signalling

legislative requirements of different signalling works		work are identified and explained according to jurisdictional health and safety legislative requirements
	1.2	Duty of care requirements are identified
	1.3	Onsite rail signalling safe work practices are identified and explained
2 Identify types of signalling equipment	2.1	Principal components of the signalling system and their purpose are identified
	2.2	Different types of signalling interlocking systems are identified
3 Identify key information in signalling design documents	3.1	The major design document types/categories and their purpose are identified
	3.2	Signalling arrangement plans/track plans are interpreted and equipment and structures are identified when inspecting a rail signalling works/site
	3.3	Key information is located in a track insulation/bonding plan when inspecting a rail signalling works/site
	3.4	The structure of a circuit book is interpreted, and key information is located
4 Apply basic signalling terminology and conventions	4.1	Basic terminology for signalling infrastructure, systems and operation is applied
	4.2	Naming and numbering conventions are applied to a range of signalling designs
	4.3	Relevant signalling standards are accessed and interpreted
	4.4	Fail safe, right side and wrong side failures are identified
5 Apply rail signalling principles	5.1	Methods of ensuring safe distances are maintained between rail vehicles are identified
	5.2	The difference between controlled and automatic signalling is identified
	5.3	Workplace procedures for maintaining independence when conducting checking or verifying actions are interpreted and applied

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 is a new unit.

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 UEERS0020 Apply rail signalling principles

Modification History

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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 two separate occasions and include:

- reading and interpreting relevant railway signalling standards and procedures
- reading a signal arrangement plan and identifying the signal equipment and its location on the rail network
- reading a signalling circuit drawing and identifying the equipment type
- using relevant standard nomenclature to identify basic signalling functions associated with signals, track circuits and point machines
- identifying the relevant technical records and documentation for construction and maintenance activities
- applying rail safe working practices and relevant industry standards, codes and rail safety regulations
- identifying relevant requirements for maintenance and construction signalling activities, including:
 - work health and safety (WHS)/occupational health and safety (OHS)
 - signalling safety practices and principles when working on signalling circuits
 - workplace procedures and practices
 - risk control measures.

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:

- relevant industry standards for railway signalling and where they can be accessed
- purpose and importance of signalling standards
- the scope of AS7711 Signalling Principles
- the role of the rail regulator and investigation organisations
- rail safety legislative requirements
- train dynamics including:
 - types of rail vehicles, including suburban/country passenger, freight, maintenance

- vehicles and heritage/tourism
- braking distance
- gradients/terrain
- sighting distance
- essentials of safe movement of trains including:
 - the role of the signalling system in enabling safe and efficient movement of trains
 - standard operating conditions as per operating timetable/schedule
- purpose of rail signalling including:
 - safe distances between rail vehicles
 - safe movement of rail vehicles
 - conflicting movement between rail vehicles
 - how the signalling system provides driver information
 - how the driver interprets the information to safely control a train
 - restrictions on the signaller and driver following an operation error, including signals passed at stop, driver exceeding speed requirement and signaller setting incorrect route
- railway signalling principles, including:
 - maintaining a safe distance between trains on the same track to prevent a collision with a preceding train
 - preventing conflicting signal movements including vehicles entering a single line from opposing directions
 - safeguarding the movement of trains at points and crossings and ensuring no conflicting movements at junctions
 - maintaining the route set during the passage of a train
 - regulating the passage of trains according to the service density and speed required
- identification and purpose of signalling equipment including:
 - signals, point machines, interlockings, train detection, level crossings, power supplies, signal control panels, non-vital telemetry, wayside protection systems
 - signal plans and nomenclature
- railway signalling practice principles:
 - the purposes and role of independence when changing the configuration of signalling
 - that only signalling design documentation that has been approved can be used
 - the purpose of applying standards and procedures for all work
 - the purpose of recording the results of work activities
 - the purpose of railway signalling documentation version control
 - the signalling equipment is tested to ensure it performs to the design
- signalling systems design safety characteristics including:
 - a failure of an item of equipment will only result in a safe state for the rail system (Failsafe)
 - design of the equipment and the circuits protects against a single failure and ensures a safe state.

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 and documentation currently used in industry
- resources that reflect current industry practices in relation to the application of signalling principles
- applicable documentation, including workplace procedures, standards and signalling designs.

Links

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