

1. Module details

Module name

Rail Signalling Control Systems

Module duration

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36–40 hours.

Module code

NUE 606

Discipline code

0703110

2. Module purpose

This module provides students with the fundamental principles and overview of mechanical and power signalling for a loop or junction station. It also focuses on the interconnection of signalling and level crossing principles.

3. Prerequisites

NUE 604.1 Rail signalling systems concepts

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from ElectroComms & Energy Utilities Qualifications Standards Body of Australia Ltd.(EESQBA).

5. Content

Signalling and Interlocking principles-mechanical

- Standard symbols
- Signalling requirements
- Signal types
- Signal aspects, numbering and positioning
- Route identification
- Route holding
- Interlocking relationships

Signalling and Interlocking principles-electrical

- Standard symbols
- Electrical signalling requirements
- Electrical signal numbering
- Route identification
- Route holding
- Track and approach locking
- Flank protection
- Overlap locking
- Stencil indicators
- Interlocking relationships
- Control table

Level crossing protection principles

- Standard symbols
- Components
- Level crossing types and operation
- Focusing
- Special controls

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Learning and assessment will take place in an environment that is conducive to a learner's development.

7. Learning outcome details

Learning outcome 1

Explain the principles and concepts of mechanical Interlocking for a simple loop or junction station.

Assessment criteria

- 1.1 Identify common mechanical signal symbols and drawings.
- 1.2 State the signalling requirements for the safe operation of a simple loop station.
- 1.3 Describe the different mechanical signal types.
- 1.4 State the standards for the correct positioning and numbering of mechanical signals.
- 1.5 Explain the purpose of route indication.
- 1.6 Explain the purpose of route holding and describe the sequence of events needed to provide it.
- 1.7 State the interlocking relationships of signals and points.

Learning outcome 2

Explain the principles and concepts of electrical Interlocking for a simple loop or junction station.

Assessment criteria

- 2.1 Identify common electrical signal symbols and drawings.
- 2.2 State the electrical signalling requirements for the safe operation of a simple loop station.
- 2.3 State the method used to number signals.

	<p>2.4 Describe route identification and holding</p> <p>2.5 Describe the principles for track locking and approach locking.</p> <p>2.6 Describe the general concepts of flank protection and overlap locking</p> <p>2.7 Describe the purpose of stencil indicators</p> <p>2.8 Explain the interlocking relationships of signals and points for a simple loop station.</p> <p>2.9 Draw a standard “control table” for a simple loop station.</p>
Learning outcome 3	Explain the operating principles and concepts of level crossing protection equipment.
Assessment criteria	<p>3.1 Identify common level crossing equipment symbols and drawings.</p> <p>3.2 Identify protection components at level crossings.</p> <p>3.3 Describe the operation of different equipment types.</p> <p>3.4 Sketch a diagram that relates to train position within control block sections covering single and multiple line boom barrier locations.</p> <p>3.5 Describe basic level crossing types and their operation</p> <p>3.6 Explain the purpose for focusing flashing lights at a level crossing.</p> <p>3.7 State the application for special controls for level crossings</p>
8. Delivery of the module	
Delivery strategy	<p>Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require learning outcome sequence other than that indicated in the module.</p>

Resource requirements

Resources should be sufficient for students to carry out learning activities on an individual basis.

Suggested Learning Resource:

- Include relevant equipment
- Include manuals or other relevant materials
- Relevant codes, standards and/or regulations

Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EEQSBA1 *User Guides* (*these outline in detail what training and work performance the Learner is required to undertake for the program*).

Occupational health and safety requirements

A safe and healthy environment will be provided for students and teachers as well as the particular safety procedures followed as part of the learning / teaching activity and content.