

<b>Title</b>	<b>Demonstrate basic knowledge of AC electric overhead traction systems</b>		
<b>Level</b>	<b>2</b>	<b>Credits</b>	<b>2</b>

<b>Purpose</b>	People credited with this unit standard are able to demonstrate: basic knowledge of the location and workings of AC traction; and knowledge of safety requirements when working around AC traction.
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<b>Classification</b>	Rail Transport > Rail Core Skills
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Assessment against this unit standard must be carried out within the context of an organisation operating under a current, valid Rail Licence issued in accordance with the provisions of the Railways Act 2005. The organisation's operating rules, codes, and instructions, referred to in this unit standard, are those the organisation has in place to meet the requirements of the Rail Licence.
- 2 Legislation relevant to this unit standard includes:  
Health and Safety at Work Act 2015.  
Railways Act 2005 and subsequent amendments.
- 3 This unit standard covers AC overhead rail traction systems operating in New Zealand. It is an introductory unit standard in terms of general knowledge and vital safety considerations. The unit standard is designed for employees of rail operators working in areas supplied with AC traction, as well as contractors engaged by the rail operator to perform on-track work. Knowledge relating to DC traction is covered in Unit 27554, *Demonstrate basic knowledge of DC electric overhead traction systems*.
- 4 Definitions  
AC refers to alternating current.  
DC refers to direct current.  
MAD refers to minimum approach distance.  
Organisational procedures refer to documents that include: operating rules, codes, instructions, and practices; equipment operating instructions; documented quality management systems; and health and safety requirements.  
RMAD refers to reduced minimum approach distance.  
RV refers to rail vehicle including rolling stock such as locomotive, multiple unit, passenger carriage, freight wagons, inspection and maintenance vehicles.
- 5 Assessment information  
All activities and evidence must be in accordance with organisational procedures.

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## Outcomes and performance criteria

### Outcome 1

Demonstrate basic knowledge of the location and workings of AC traction.

#### Performance criteria

- 1.1 AC networks are identified in terms of routes, distance, and voltage.
- 1.2 Components of AC traction systems are identified.
- Range may include but is not limited to – contact wire, catenary wire, droppers, pantograph, track bonds.
- 1.3 Basic knowledge of electricity as it relates to AC traction is described.
- Range may include but is not limited to – current, conductors, insulation, arcing, earthing, isolated circuit, live circuit, all wires treated as live, automated circuit breaks (number and duration between re - sets), manual circuit breaks.
- 1.4 Signs of problems with AC traction systems are identified.
- Range may include but is not limited to – arcing, damaged or broken insulators, loose or hanging parts, vegetation in contact with overhead, broken pantograph, defective track bonds.

### Outcome 2

Demonstrate knowledge of safety requirements when working around AC traction.

#### Performance criteria

- 2.1 Working proximity rules relating to AC traction are described.
- Range may include but is not limited to – without permit (minimum approach distance), with permit (reduced minimum approach distance), personnel, plant, use of safety observer, limited access to top of RVs.
- 2.2 Risks associated with making contact with electrified lines are identified.
- 2.3 Equipment use in AC traction areas are described in terms of restrictions specified in organisational procedures.
- Range may include but is not limited to – ladders, measuring tapes, water blasters, high pressure hoses.

2.4 Managing RV derailments in AC electrified areas is described.

Range risks, treat as live, exiting RVs (including use of ladders), all RVs in a consist (possible current return path).

2.5 Fire extinguisher types approved for use with AC traction systems are identified.

2.6 Steps to isolate power in an emergency are described.

Range may include but is not limited to – scoping and defining the problem, contacting train control, locating and interpreting marker plates, clear explanation of who/what is affected.

<b>Planned review date</b>	31 December 2025
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#### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 August 2011	31 December 2022
Review	2	29 April 2021	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

#### Comments on this unit standard

Please contact the Competenz [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.