



Australian Government

TLIK0006 Identify new and emerging technologies in the rail industry

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Modification History

Release	Comments
1	This unit of competency was first released in TLI Transport and Logistics Training Package Release 18.0.

Application

This unit describes the performance outcomes, skills and knowledge required to investigate and report on new and emerging technologies in the rail industry.

It requires the ability to investigate and interpret information on the benefits of key technological advancements in rolling stock design and maintenance, digital control systems and rail operation energy efficiency. It also includes the ability to investigate other new and emerging rail technologies to improve rail operations and passenger safety.

The unit applies to those who wish to prepare for entry level employment and/or further study in the rail transport industry. It does not provide competence to undertake rail safety work or operate rail systems.

Licensing/Regulatory Information

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

Pre-requisite unit(s)

Not applicable.

Competency field(s)

N/A

Unit sector(s)

Rail Sector.

Elements and Performance Criteria

Elements	Performance criteria
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Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Identify technologies supporting safe rail operations	1.1	Identify technologies used to support safe rail operations across the globe
		1.2	Describe the purpose of these technologies in improving the safe management and movement of rail services.
		1.3	Identify examples of technologies used currently in the Australian rail context.
		1.4	Describe the benefits of these technologies to Australian rail operators and customers
		1.5	Identify technologies that improve passenger safety and accessibility.
		1.6	Describe how technologies supporting monitoring, communication and control reduce operational risk
2	Identify technologies supporting sustainability	2.1	Identify technologies that improve energy efficiency of rolling stock and mobile assets
		2.2	Identify technologies supporting decarbonisation
		2.3	Identify technology innovations supporting sustainable infrastructure
		2.4	Describe environmental benefits associated with emerging technologies
3	Identify emerging rail technologies	3.1	Identify examples of emerging technologies in domestic and international rail contexts
		3.2	Describe potential applications of one emerging technology in the Australian context
		3.3	Describe potential benefits and challenges associated with emerging technologies
		3.4	Identify technologies supporting future workforce capability
4	Report on new and emerging rail technologies	4.1	Collate information and prepare draft report

		4.2	Review draft report to identify areas requiring further information or improvement
		4.3	Amend draft report and finalise for submission

Foundation Skills

Foundation Skills essential to successful completion of this unit are mapped to the Australian Core Skills Framework (ACSF) and the European Digital Competence Framework (DigComp 3.0). Further information is available in the TLI Training Package Foundation Skills Companion Volume.

Assessment Requirements for TLIK0006 Identify new and emerging technologies in the rail industry

Performance Evidence

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

Evidence must demonstrate the ability to:

- identify technologies that support the safe and efficient operation of rail networks
- identify technologies that improve:
 - rail operations
 - operational and passenger safety
 - energy efficiency and sustainability
 - customer experience
 - workforce capability
- describe the purpose and potential benefits of at least **three (3)** technologies currently used within Australian rail networks
- investigate and describe at least **two (2)** emerging technologies that have the potential to influence future rail operations, including their potential applications, benefits and challenges
- identify the contribution of technology to improving one or more of the following:
 - operational efficiency
 - network capacity
 - safety
 - environmental sustainability
 - accessibility
 - customer service
- research, organise and document information using appropriate sources
- prepare a report that:
 - accurately describes current and emerging rail technologies
 - uses appropriate rail industry terminology
 - explains how technology supports the future development of the rail industry
 - incorporates feedback or self-review before final submission

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:

- basic function of a communication-based train control (CBTC) system
- CBTC interconnection with other advanced technologies such as:
 - computer based interlocking (CBI)
 - high-capacity signalling (HCS)
- benefits of CBTC to rail network operators and passengers
- the application of technologies to improve railway transport energy efficiency and sustainability such as:
 - alternate material for rail sleepers
 - sustainable rail stations
 - hybridisation of conventional diesel/diesel-electric locomotive propulsion
 - alternate fuels
 - regenerative braking
- innovations in light rail technology:
 - trackless trams
 - wireless power supply
 - energy optimisation
 - mechatronic switches
 - active pantographs
 - drivers assist and collision avoidance systems
- innovations in heavy rail technology:
 - autonomous trains
 - use of Artificial Intelligence (AI)
 - Internet of Trains (IoT)
 - magnetic levitation (Maglev trains)
- advantages and disadvantages of high-speed rail (HSR)
- application of technology (simulator) for train/tram driver training
- typical components of a report template
- purpose and benefits of a document review process
- types of document review processes such as:
 - peer review
 - self-review
 - trainer review
 - spell check
- basic on-line research techniques

Assessment Conditions

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

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

Resources for assessment include:

Both practical skills and knowledge must be assessed in a simulated assessment environment. Students must have access to:

- suitable learning environment such as a classroom equipped with data projector and screen
- computer hardware/software with access to the internet
- relevant template to document report information
- personal protective equipment (PPE) for on-site visits

Unit Mapping Information

Links

Companion volumes, including implementation guides, are found on the national training register - <https://training.gov.au/training/details/TLI>.