



Australian Government

UEENEEN101A Maintain mechanical rail signalling equipment and infrastructure

Release: 2

UEENEEN101A Maintain mechanical rail signalling equipment and infrastructure

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers maintenance of mechanical signalling and infrastructure, connected to electro mechanical equipment. It encompasses safe working, regulatory requirements, following maintenance procedures, checking operation and functionality of signalling equipment and infrastructure, and reporting.

Application of the Unit

Application of the Unit 2)

This unit shall apply to qualifications in installation and maintenance of rail signalling.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit may only be practised in the workplace under the codes of practice and regulations of the State/Territory for which the work is carried out. This includes codes of practice such as the 'Code of Practice for the Defined Interstate Rail Network' for work carried out on that network.

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills 5)

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit
Performance Criteria describe the required performance needed to demonstrate achievement of the element.
Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare maintain mechanical signalling equipment and infrastructure	1.1 OHS procedures for a given work area are identified, obtained and understood. 1.2 Established OHS risk control measures and procedures are followed in preparation for the work. 1.3 Safety hazards that have not previously been identified are noted, and established risk control measures are implemented. 1.4 Maintenance is appropriately sequenced in accordance with job schedule 1.5 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site 1.6 Location of equipment to be maintained is determined from job specifications and diagrams 1.7 Materials needed for maintenance are obtained in accordance with established procedures and checked against job requirements 1.8 Tools, equipment and testing devices needed to conduct maintenance work are obtained in accordance with established procedures and checked for correct operation and safety

ELEMENT	PERFORMANCE CRITERIA
2 Carry out the maintenance of mechanical signalling equipment and infrastructure	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 All chemicals, lubricants and consumables are used and disposed of in compliance with material safety sheets and OHS codes and practices.
	2.3 All rubbish, weeds and obstructions are removed from equipment and housings.
	2.4 Initial visual check of operational equipment is performed to identify any equipment faults.
	2.5 External surfaces are prepared/painted to organisation standards to protect the equipment.
	2.6 All internal surfaces and operational components are cleaned and lubricated to ensure operational effectiveness.
	2.7 Maintenance is carried out in accordance with relevant standards and requirements and established routines.
	2.8 Established methods for dealing with unexpected situations are discussed with appropriate person(s) and documented.
	2.9 Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.10 Maintenance is carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
3 Complete the maintenance of mechanical signalling equipment and infrastructure	3.1 OHS work completion risk control measures and procedures are followed.
	3.2 Approval to conduct a check of equipment

ELEMENT**PERFORMANCE CRITERIA**

- operation is obtained in accordance with relevant operational rules and procedures.
- 3.3 Track clearance check is made before conducting equipment operation check to ensure safe train movement.
- 3.4 Authorised equipment check is carried out in accordance with operating procedures to identify any equipment faults.
- 3.5 Operational effectiveness of equipment is confirmed through observation during train movements if required.
- 3.6 Equipments faults are correctly identified; recorded and appropriate corrective action is taken.
- 3.7 Equipment is locked and secured to prevent unauthorised access.
- 3.8 Work completion is documented and appropriate person(s) notified in accordance with established procedures, and relevant reports produced.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and servicing mechanical rail signalling equipment and infrastructure.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EN101A Mechanical rail signalling equipment and infrastructure maintenance requirements and techniques

Evidence shall show an understanding of mechanical rail signaling equipment and infrastructure maintenance requirements and techniques, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

Basic rail operations encompassing:

Rail terminology

Train dynamics

Essentials of safe movement of trains

Purpose of rail signaling

Rail signaling, regulations and codes encompassing:

Codes philosophy and format

How to read and apply a code

Codes that apply to rail signaling - relevant to a particular rail network.

Technical manuals and catalogues encompassing:

Typical format

How to read and apply information

Environmental and heritage awareness encompassing:

Purpose of environmental and heritage regulation

Typical issues affecting electrotechnology services and systems

Meeting requirements

Enterprise work activities records encompassing:

REQUIRED SKILLS AND KNOWLEDGE

Purpose and extent of maintaining work activities records in an enterprise

Types of records for maintaining work activities in an enterprise

Methods for recording and maintaining work records

Work records required by regulation requirements

Electrical safe working practices encompassing:

Risk management and assessment of risk:

Principle and purpose of risk management, and

Processes for conducting a risk assessment

Hazards associated with low-voltage, extra-low voltage and high-currents;

Arrangement of power distribution and circuits in an electrical installations

Parts of an electrical system and equipment that operate at low-voltage and extra-low voltage,

Parts of an electrical system and equipment where high-currents are likely.

Safety, selection, use, maintenance and care of test equipment:

Safety characteristics of electrical testing devices,

Safe use of electrical testing device, and

Checks and storage methods for maintaining the safety of testing devices.

Rail safe working practices encompassing:

Rail enterprise safety standard and procedures

Rail safe working requirements

Possessions protection and management

Rail signaling, drawings and diagrams encompassing:

Drawing types and applications encompassing:

Drawing layouts and conventions.

Drawing symbols

Cable and equipment schedules

Rail signaling principles, mechanical encompassing:

Overview of mechanical rail signaling

Purpose of elements of a mechanical rail signaling systems - signals, point actuating

REQUIRED SKILLS AND KNOWLEDGE

systems, locking and train detection systems, control input devices, indicators, diagrams and monitors, interlocking, and safe working systems.

Rail signaling, mechanical equipment encompassing:

Equipment and their components

Operating principles

Servicing procedures.

Rail signaling, point actuating devices encompassing:

Equipment and their components - point machines, detectors, claw/clamp locks, swing nose mechanisms, in-bearer mechanisms

Operating principles

Servicing procedures

Rail signaling, interlocking systems, mechanical encompassing:

Equipment and their components

Operating principles and parameters

Servicing procedures

Rail signaling, electro-pneumatic equipment encompassing:

Equipment and their components - compressors, air lines, control valves

Operating principles and parameters

Servicing procedures.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all components parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it must include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this

Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit** 9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
 - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
 - Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Service mechanical signalling equipment and infrastructure as described in 8) and including:
 - a. Interpreting specifications correctly
 - b. Maintaining equipment in accordance with workplace procedures
 - c. Using chemicals and tools safely
 - d. Testing that equipment is fully functional after maintenance

- e. Checking that technical/operational specifications are met and that equipment is in compliance with work orders
- f. Applying effective fault diagnosis techniques,
- g. Ensuring safe trained movement through work area,
- h. Following relevant codes of practice, OHS and environmental protection procedures and requirements
- i. Completing relevant technical reports, records and documentation, and
- j. Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

**Context of and
specific
resources for
assessment** **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to servicing mechanical signalling equipment and infrastructure.

**Method of
assessment****9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

**Concurrent
assessment and
relationship with
other units****9.5)**

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to:

- The relevant State/Territory codes of practice and safe working requirements.
- Code of practice for the defined interstate rail network.

Equipment relevant to a particular rail network may include the following:

- Mechanical signalling equipment may include points, derails, signals, rodding & cranks, signal leads, annett locks, and ground frames.
- Infrastructure may include foundations, signal structures, housings and platforms.
- Electromechanical equipment may include lever locks, releasing switches, point detectors/controllers, circuit controllers, indication & repeating devices.
- Test equipment may include mechanical measurement devices, to specified tolerance. (e.g. steel rule, gauges), multimeter

Activities may include: maintenance, cleaning, and lubricating of equipment using work procedures, location: & circuit plans and locking sketches.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Section 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Rail Signalling