



Australian Government

UEENEEN110A Install and maintain non-vital telemetry systems

Release: 2

UEENEEN110A Install and maintain non-vital telemetry systems

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers installation and maintenance of non-vital telemetry equipment and systems in a rail network. It encompasses safe working, regulatory requirements and following installation and work procedures performing scheduled maintenance, finding and repairing faults, testing telemetry equipment, certifying and reporting.

Application of the Unit

Application of the Unit 2)

This unit shall apply to qualifications in installation and maintenance of rail signalling electrical power and control systems.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit may only be practised in the workplace under regulations related to electrical work, the codes of practice and regulations of the State/Territory in 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.

UEENEEE101 Apply Occupational Health and Safety regulations, codes and practices in the workplace
A

And

Relevant work place requirements in 'Work site protection' have been acquired.

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 4 Writing 4 Numeracy 4

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 to install and maintain non-vital telemetry systems	<p>1.1 OHS procedures for a given work area are identified, obtained and understood.</p> <p>1.2 Established OHS risk control measures and procedures are followed in preparation for the work.</p> <p>1.3 Safety hazards that have not previously been identified are noted, and established risk control measures are implemented</p> <p>1.4 The normal function of the equipment is established through reference to operating manuals, systems, specifications and operators interface.</p> <p>1.5 Materials needed to install and maintain non-vital telemetry systems are obtained in accordance with system specifications and established procedures.</p> <p>1.6 Tools, equipment and testing devices needed to install and maintain non-vital telemetry systems and diagnose the fault are obtained in accordance with established procedures and checked for correct operation and safety.</p>
2 Install and maintain non-vital telemetry systems	<p>2.1 OHS risk control measures and procedures for carrying out the work are followed.</p> <p>2.2 Installation and maintenance work are carried out to manufacturer specifications using procedures consistent with delegated authority</p>

ELEMENT**PERFORMANCE CRITERIA**

- 2.3 Normal function and operating parameters are confirmed using appropriate manuals, specifications and the operators interface.
- 2.4 Fault finding and diagnostic techniques are completed using circuit diagrams and manufacturer specifications to verify system/faults.
- 2.5 Faulty, damaged or insecure components are replaced, repaired or secured in accordance with manufacturer specifications and organisation procedures.
- 2.6 Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes.
- 2.7 Installation and maintenance work is carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
- 2.8 Faults are diagnosed efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
- 2.9 The fault is isolated and assessed to determine the most appropriate repair method, tools, and test and measurement instruments to be used.
- 2.10 Faulty, damaged or insecure components are replaced, repaired, or secured to manufacturer/technical specifications and the equipment is returned to service.
- 2.11 Parts/components requiring repairs beyond the repair capacity of the service centre are dispatched for external repairs or disposed of in accordance with the organisation procedures.
- 2.12 Parts/components identified as suitable for replacement are replaced from available parts/component resources.
- 2.13 Faults are rectified efficiently without waste of

ELEMENT**PERFORMANCE CRITERIA**

- materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
- 2.14 Repaired/replaced equipment is tested using approved test equipment in accordance with appropriate test procedures to ensure equipment is fully operational.
- 2.15 All test equipment used is checked to ensure it is within calibration standards.
- 2.16 All appropriate adjustments and calibrations are carried out to the specified settings and values.
- 3 Complete the installation and maintenance of non-vital telemetry systems
- 3.1 OHS work completion risk control measures and procedures are followed.

Required documentation is completed, including confirmation that equipment has been repaired to manufacturer specifications and relevant reports produced.

Arrangements are made for the safe return of equipment to the customer and in accordance with workplace procedures.

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 the installation and maintenance of non-vital telemetry systems.

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

KS01-EN110A Non-vital telemetry systems installation and maintenance

Evidence shall show an understanding of non-vital telemetry systems installation and maintenance, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

Electronic switching encompassing:

Devices and used for electronic switching and their switching characteristic

Circuit configuration and switch-on, switch-off conditions

Faults in electronic switching devices/circuits

Typical applications of electronic switching

Using supervisory control and data acquisition systems encompassing:

SCADA system features and applications:

Industries in which SCADA systems are used and

Associate benefits of the package.

Features and facilities of different SCADA packages.

Hardware requirements

Transmission protocols encompassing:

Carriers

multidrop configuration

Time division multiplexing

relay and CBI interfaces

data structure

Note: Elements include: addressing, parity, cyclic redundancy check, direction control data, indication data.

Reading mimics and animated graphics

REQUIRED SKILLS AND KNOWLEDGE

Trending:

Analysis of process to select data,

Viewing data and graphical representation of selected information

Trend graphs and data matching

Alarm logging:

Analysing select data,

Corrective action of alarm status

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/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 time frames 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:
 - Install and maintain non-vital telemetry systems as described in 8) and including:
 - a. Interpreting plans and specifications correctly,
 - b. Installing, maintaining and testing of non-vital telemetry equipment in accordance with workplace procedures
 - c. Using effective and efficient diagnostic fault finding techniques,
 - d. Using resources efficiently,
 - e. Repairing equipment in accordance with workplace procedures,
 - f. Ensuring repaired equipment conforms to manufacturers specifications,
 - g. Calibrating and using test equipment and tools correctly,
 - h. Following relevant codes of practice, environmental protection procedures and requirements, and
 - i. Following correct liaison procedures
 - j. Completing relevant technical reports records and documentation, and
 - k. 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 maintaining electronic signalling and communication equipment.

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)

For optimisation of training and assessment effort, competency development in this unit may be arranged in combination with other competencies required by a given enterprise installation, maintenance and repair functions.

Concurrent assessment may include:

UEENEEN118A Find and repair rail signal system faults

UEENEEN114A Install and maintain computer based interlocking systems

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.
- Equipment relevant to a particular rail network.
- Code of practice for the defined interstate rail network.

Activities may include: procedures for maintenance of electronic signalling and communication equipment and may also include; the use of plans and drawings, manufacturer's / enterprise specifications and manuals.

Maintenance activities may include: repairing faults in electronic signalling and communications systems in a rail network and may also incorporate safe working, diagnosing and rectifying system faults, repair and replacing faulty equipment and following work procedures. It may also include calibrating and testing as well as reporting work activities.

Electronic equipment may include: computers and associated peripherals, network switches, modems, control systems, including electronic cards, software and firmware, cabling and associated connectors, including fibre optical, coaxial, and shielded/screened and CAT 5, input/output interfacing devices and surge protection.

Test equipment may include: laptop computer and peripherals and multimeter.

Technical report may include: incident report, data log report

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

