



**Australian Government**

# **UEENEEH105A Verify functionality and compliance of custom electronic installations**

Release 2

# **UEENEEH105A Verify functionality and compliance of custom electronic installations**

## **Modification History**

Not applicable.

## **Unit Descriptor**

### **Unit Descriptor**

#### **1) Scope:**

##### **1.1) Descriptor**

This unit covers testing and visual inspection for verifying that a custom electronic system and components are safe and comply with requirements and functions as intended. It encompasses working safely, conducting compliance tests, conducting visual inspections, identifying non-compliance defects and mandatory reporting requirements.

## **Application of the Unit**

### **Application of the Unit 2)**

This unit is intended to augment previously acquired competencies. It is suitable for employment-based programs under an approved contract of training.

## **Licensing/Regulatory Information**

### **License to practice 3)**

The skills and knowledge described in this unit require a license to practice in the workplace where plant and equipment operate at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some States/Territories subject to regulations related to electrical work.

Where the components of the custom electronic system

## License to practice

3)

are connected to the public telephone system facility practice in the workplace is also subject to ACMA regulations to undertake cabling work.

Note:

Units UEENEEF101A and UEENEEF102A provide the required skill and knowledge for registration in accordance with ACMA regulations for undertaking cabling work.

Practice in the workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

## 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

UEENEEE1 02A Fabricate, dismantle, assemble of utilities industry components

UEENEEE1 05A Fix and secure electrotechnology equipment

UEENEEE1 07A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEE1 08A Lay wiring/cabling and terminate accessories for extra-low voltage (ELV) circuits

UEENEEH1 06A Assemble and set up fixed video/audio components and systems in buildings and premises

**Prerequisite Unit(s) 4)**

For the full prerequisite chain details for this unit please refer to Table 2 in Volume 1, Part 2

**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 verify custom electronic installations.	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, which have not previously been identified, are noted and established risk control measures are implemented.
	1.4 Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved on the work site.
	1.5 Location of system components is determined from specifications and diagrams.
	1.6 Inspection and tests are appropriately sequenced in accordance with job schedule.
	1.7 Materials needed for the tests and verification are obtained in accordance with established procedures and checked against job requirements.
	1.8 Tools, equipment and testing devices needed to verify compliance are obtained in accordance with established procedures and checked for correct operation and safety.
2 Visually inspect the installation.	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3 Cabling is checked for appropriate type and size.
	2.4 Cabling, accessories and components are validated as being suitably located, securely fixed and suitably protected from damage or corrosion.

**ELEMENT**

**PERFORMANCE CRITERIA**

- 2.5 Accessories and components are validated as being appropriately rated and meeting functional requirements.
- 2.6 Evidence that equipment complies with safety and functional requirements is cited.
- 2.7 Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
- 2.8 Unexpected situations are dealt with safely and with the approval of an authorised person.
- 2.9 Inspection is carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
- 3 Conduct tests.
  - 3.1 OHS risk control measures and procedures for carrying out the work are followed.
  - 3.2 Testing or measuring on a live and operating system in strict accordance with OHS requirements and within established safety procedures.
  - 3.3 Circuits/machines/plant are checked as being isolated in strict accordance OHS requirements and procedures.
  - 3.4 Tests are conducted to verify that the cabling is safe and meets specified standards and any applicable regulatory requirements.
  - 3.5 Custom electronic apparatus and devices are tested to ensure the installation is safe and functions as intended.
  - 3.6 Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
  - 3.7 Unexpected situations are dealt with safely

**ELEMENT**

**PERFORMANCE CRITERIA**

- and with the approval of an authorised person.
- 3.8 Testing is carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
- 4 Report inspection and verification findings.
- 4.1 OHS work completion risk control measures and procedures are followed.
- 4.2 Work site and equipment is cleaned and made safe in accordance with established procedures.
- 4.3 Non-compliance defects are identified and reported in accordance with established procedures.
- 4.4 Recommendations for rectifying defects are made in accordance with established procedures.
- 4.5 Work completion is documented and an appropriate person(s) notified in accordance with established 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 verifying compliance and functionality of custom electronic installations.

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

#### **KS01-EH105A Custom electronic installations, testing and verification methods**

Evidence shall show an understanding of custom electronic installations, testing and verification methods, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

##### T1 Sound reproduction fundamentals

- Sound wave propagation
- Timbre of sound
- Effects of other medium of sound waves
- Characteristics of the human ear
- Difference between mono and stereo
- Surround sound principles

##### T2 Audio reproduction, electronic components

- Preamplifiers amplifier encompassing:
  - Function in the reproduction chain
  - Typical circuit arrangements
- Power and integrated amplifiers encompassing:
  - Function in the reproduction chain
  - Typical circuit arrangements
- Graphic equalizers encompassing:
  - Function in the reproduction chain
  - Typical circuit arrangements
- Component installation and interconnections

##### T3 Audio reproduction, speaker fundamentals

- Types of speaker drives and their operating mechanism
- Speaker cabinet characteristics
- Purpose and circuit arrangement of typical cross-over networks
- Speaker installation and connections

##### T4 Audio/video recording and replay components repair basics

- Sub-system components (i.e. functional blocks) and their operating parameters



## REQUIRED SKILLS AND KNOWLEDGE

- Common faults, their symptoms and cause.
- Fault location procedures and testing points
- Device adjustments - audio/video recording and replay components are audio cassette player/recorders, compact disk players, video cassette player/recorder, digital versatile disk and super audio compact players.

### T5 Audio/video control equipment

- Types of control devices and their operating principles
- Control equipment arrangement in an audio/video system

### T6 Video systems installation

- Installation and set-up of digital TV reception equipment
- Installation and set-up of DVD machines
- Operating requirements of remote control units

### T7 Electronic safe working practices

- Risk management and assessment of risk encompassing:
  - Principle and purpose of risk management, and
  - Processes for conducting a risk assessment
- Hazards associated with low-voltage, extra-low voltage and high-currents encompassing:
  - Parts of an electronic systems and equipment that operate at low-voltage and extra-low voltage,
  - Parts of an electronic systems and equipment where high-currents are likely.
- Risks and control measures associated with high-voltage encompassing:
  - Parts of an electronic systems and equipment that operate at high-voltage,
  - The terms used - 'touch voltage', 'step voltage', 'induced voltage' and 'creepage' as they relate to the hazards of high-voltage, and
  - Control measures used for dealing with the hazards of high-voltage.
- Risks and control measures associated with low voltage encompassing:
  - Risks associated with installation, fault finding, maintenance and repair.
  - Control measures before, while and after working on electronic systems or equipment
  - Isolation and tagging-off procedures.
  - Risks and restrictions in working live.
  - Control measures for working live.
- Safety, selection, use, maintenance and care of test equipment encompassing:
  - Safety characteristics of electrical testing devices,
  - Chemical cleaning solvents, glues and joining wastes used in electronics,
  - Safe use of electrical testing device, and
  - Checks and storage methods for maintaining the safety of testing devices.

## 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 parts of the 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. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord 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 nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. 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 shall 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:
  - Verify compliance and functionality of custom electronic installations as described in 8) and including:
    - A Identifying visual defects.
    - B Conducting all tests safely and correctly.
    - C Identifying non-compliant defects from test results.

- D Recommending appropriate corrective actions.
- E Acting within regulatory limits.
- F Reporting legibly and accurately.
- G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a 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 part of 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 verifying compliance and functionality of custom electronic installations.

**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 that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended 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 verifying compliance and functionality of custom electronic installations with at least two different new or existing custom electronic installations. One installation shall include a basic integrated system.

Verification shall include the following:

- Visual inspection of cabling, accessories and apparatus and controls
- Conducting all safety and compliance tests

Note:

1. Testing includes isolation testing; insulation resistance; cable tests to specified standard (e.g. Category 5 standard); polarity tests; continuity of earthing; correct connections performance tests.

2. Electrical testing may be limited by the scope permitted under restricted electrical work

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, Part 2.1.

## **Unit Sector(s)**

Not applicable.

## **Competency Field**

**Competency Field**            11)  
    Electronics