



Australian Government

Department of Education, Employment and Workplace Relations

UEENEEH102A Repairs basic electronic apparatus faults by replacement of components

Release: 1

UEENEEH102A Repairs basic electronic apparatus faults by replacement of components

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit deals the replacement of electronic components, cabling and sub systems of electronic apparatus. It encompasses safe working practices, following written and oral instruction and procedures, basic testing and techniques, dismantling and assembling apparatus and disconnecting and reconnecting components.

Application of the Unit

Application of the Unit 2)

This unit may apply to persons entering work in electro technology and may be used in school based vocational programs.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not require a license to practice in the workplace provided equipment is not connected to installation wiring at voltage above 50 V a.c. or 120 V d.c. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant,

License to practice

3)

machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment and the like. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures

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

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 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 to repair electronic apparatus.	<p>1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.</p> <p>1.2 Established OHS risk control measures and procedures are followed in preparation for the work.</p> <p>1.3 The nature of the repair is obtained from documentation or from work supervisor to establish the scope of work to be undertaken.</p> <p>1.4 Advice is sought from the work supervisor to ensure the work is co-ordinated effectively with others.</p> <p>1.5 Sources of materials that may be required for the work are established in accordance with established routines and procedures.</p> <p>1.6 Tools, apparatus and testing devices needed to carry out the work are obtained and</p>

ELEMENT	PERFORMANCE CRITERIA
	checked for correct operation and safety.
2 Repair electronic apparatus.	<p data-bbox="523 365 1219 470">2.1 Established OHS risk control measures and procedures for carrying out the work are followed.</p> <p data-bbox="523 504 1219 654">2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.</p> <p data-bbox="523 687 1219 792">2.3 Circuits/apparatus are checked as being isolated where necessary in strict accordance OHS requirements and procedures.</p> <p data-bbox="523 826 1219 931">2.4 Apparatus is dismantled in accordance with manufacturer's guide and supervisor's instructions.</p> <p data-bbox="523 965 1219 1115">2.5 Component parts are tagged during the dismantling to help ensure correct and efficient reassembly and stored to protect them against loss or damage.</p> <p data-bbox="523 1149 1219 1254">2.6 Repairs are affected efficiently without damage to other components, apparatus or circuits.</p> <p data-bbox="523 1288 1219 1438">2.7 Apparatus is assembled in an appropriate sequence with all components parts placed, secured and connected in accordance with manufacturer's guide or industry practice.</p> <p data-bbox="523 1471 1219 1576">2.8 Procedures for referring non-routine events to immediate supervisor for directions are followed.</p> <p data-bbox="523 1610 1219 1758">2.9 Repairs are carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.</p>
3 Complete and report repair work activities.	<p data-bbox="523 1792 1219 1861">3.1 OHS work completion risk control measures and procedures are followed.</p> <p data-bbox="523 1895 1219 1966">3.2 Repaired apparatus is prepared and forwarded to appropriate person(s) for</p>

ELEMENT

PERFORMANCE CRITERIA

testing.

- 3.3 Work area is cleaned and made safe in accordance with established procedures.
- 3.4 Work supervisor is notified of the completion of the repair work 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 carrying out basic repairs to electronic apparatus by replacement of components. All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EH102A Component replacement to repair basic electronic apparatus faults

Evidence shall show an understanding of component replacement to repair basic electronic apparatus faults, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1. Electronic soldering equipment and techniques

- Workshop hazards and safety associated with soldering
- Quality concepts
- Electronic soldering equipment
- The soldering process
- Lead free solder

T2. Printed circuit board soldering techniques

- Electronic component mounting
- Solder rework of printed circuit boards.
- Faulty solder joints

T3. Soldering electronic cables

- Soldering multi-strand, ribbon and coaxial cables
- Effects and prevention of electrostatic discharge (ESD)

T4. Electronic component basics

- Types of components
- The physical features and primary characteristic of components
- Marking and codes on components
- Handling static sensitive components

T5. Electronic cable overview and coaxial cable

- Coaxial cables types and characteristics
- Coaxial cable termination

T6. Performance copper cables

- Twisted pair voice and data cables
- Insulation displacement (IDC) termination
- Colour codes
- Terminating performance cables

REQUIRED SKILLS AND KNOWLEDGE

- Harness wiring

T7. Electronic apparatus components

- Fault finding
- Testing
- Replacement

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:

- Carry out basic repairs to electronic apparatus by replacement of components as described in 8) and including:

- A Following manufacturer service instructions for access to components.
- B Removing at least three different types of components specified in the work instructions.
- C Replacing components to manufacturer requirements.
- D Terminating correctly electronic cables using solderless termination techniques
- E De-soldering and soldering to a high reliability standard and without damage to components.
- F Reassembling the apparatus correctly.
- G Testing apparatus operation.
- H 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 carrying out basic repairs to electronic apparatus by replacement of components.

**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)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEE10 Fabricate, dismantle, assemble of utilities industry
2A components

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 carrying out basic repairs electronic apparatus limited to replacement or repair of components, including sub systems in which the fault has been previously established.

At least two of the repairs shall require soldering and desoldering and at least two of the repairs shall require a cable to be correctly terminated using a solderless termination technique.

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