



Australian Government

UEEEEC0037 Fault find and repair telecommunication apparatus and systems

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to fault find and repair telecommunication apparatus and systems.

It includes preparing to find and repair faults, finding and repairing faults, and completing and reporting on fault-finding and repair activities.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, skills and knowledge described in this unit require a relevant contract of training, such as an Australian Apprenticeship.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Permits may also be required for some work environments, such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

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

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEEEEC0060 Repairs basic electronic apparatus faults by replacement of components

UEEEEC0075 Troubleshoot single phase input d.c power supplies

UEEEEC0069 Troubleshoot digital sub-systems

UEEEEC0066 Troubleshoot amplifiers in an electronic apparatus

UEEEEC0019 Develop software solutions for microcontroller-based systems

UEEEEC0028 Fault find and repair complex power supplies

and

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

and

UEEEEC0074 Troubleshoot resonance circuits in an electronic apparatus

UEEEEC0065 Solve problems in basic electronic circuits

or

UEEEL0019 Solve problems in direct current (d.c.) machines

UEEEL0021 Solve problems in magnetic and electromagnetic devices

UEEEL0020 Solve problems in low voltage a.c. circuits

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to find and repair fault

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1** WHS/OHS requirements and workplace procedures for relevant work area are identified, obtained and applied
- 1.2** Risk control measures are applied in accordance with workplace procedures prior to commencing work
- 1.3** Risks/hazards are identified, assessed and reported to relevant person/s and control measures implemented
- 1.4** Extent of faults is determined from reports, other relevant documentation and discussions with relevant person/s
- 1.5** Relevant person/s is consulted to ensure the work is

coordinated effectively with others

- 1.6** Tools, equipment and testing devices required to diagnose faults are obtained in accordance with workplace procedures and checked for correct operation and safety

2 Find and repair fault

- 2.1** Workplace risk control measures and procedures are applied
- 2.2** Need to test and measure live work is determined in accordance with WHS/OHS requirements and workplace procedures
- 2.3** Circuits/machines/plant are checked and isolated, as required, in accordance with WHS/OHS requirements and workplace procedures
- 2.4** Logical diagnostic methods are applied to diagnose telecommunication apparatus and system faults employing measurements and estimations of system operating parameters referenced to system operational requirements in accordance with workplace procedures and relevant industry standards
- 2.5** Suspected fault scenarios are tested in accordance with workplace procedures and relevant industry standards
- 2.6** Source of the fault is identified and relevant person/s engaged to rectify the fault in accordance with workplace procedures and relevant industry standards
- 2.7** Faults in electronic components are rectified to raise telecommunication apparatus and system to its operation standard
- 2.8** System is tested to verify that the system operates as intended and to specified requirements
- 2.9** Decisions for dealing with unplanned situations are made based on job specifications, work requirements and discussions with relevant person/s
- 2.10** Methods for dealing with unplanned situations are selected on the basis of safety and specified work outcomes
- 2.11** Diagnosis and rectification activities are carried out efficiently without waste of materials, damage to apparatus, the surrounding environment or services

- applying sustainable energy practices
- 3 Complete and report fault-finding and repair activities**
- 3.1** WHS/OHS work completion risk control measures and workplace procedures are followed
- 3.2** Worksite is made safe in accordance with workplace procedures
- 3.3** Rectification of faults is reported in accordance with workplace procedures
- 3.4** Relevant person/s is notified that the system faults have been rectified in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Fault finding and repairing faults in electronic telecommunication apparatus and systems must include at least the following:

- two system faults

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH133A Fault find and repair telecommunication apparatus and systems.

Links

Companion Volume implementation guides are found in VETNet - -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEC0037 Fault find and repair telecommunication apparatus and systems

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- applying logical diagnostic methods
- using fault scenarios to test the source of system faults
- identifying faults and competency needed to rectify them
- rectifying faults in system electronics
- verifying that the system operates correctly
- documenting fault rectification
- dealing with unplanned events
- applying relevant risk identification, assessment, reporting and control requirements
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including the use of risk control measures
- applying sustainable energy principles and practices
- coordinating work with relevant person/s
- determining live testing/measurement requirements
- determining scope of work
- identifying and accessing materials, tools, apparatus and testing devices
- isolating circuits/machines/systems.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- telecommunication apparatus and system fault finding and repair, safe working practices and relevant standards, codes and regulations, including:
 - telephone system fundamentals:
 - the transmission of sound in a telephone system encompassing:
 - function of telephone transmitters and receivers
 - components and functions of the telephone

- purpose of earthing and protection in a telephone system
- customer switching systems encompassing:
 - basic function
 - difference between a key system and a private automatic branch exchange (PABX)
 - advanced features
- basic operations of system distribution frames (SDF)/test point frames (TPF), power fail and line interface requirements (e.g. indial, rotary groups, ISDN, extension and tie-line circuits)
- types, purpose, use, and requirements of metering devices
- metering and installation arrangements of public/pay phones
- installation methods and requirements encompassing:
 - customer switching systems (CSS)
 - interfacing equipment
 - termination of CSS equipment
- requirements for programming of CSS
- hazard associated the electronic components of CSS encompassing:
 - static discharge
 - chemical damage
 - mechanical damage
 - electromagnetic Interference
- telephone network facilities:
 - network subsystems (i.e. functional blocks) components and operating parameters
 - switches within the network
 - customer accesses infrastructure
 - system security
- telecommunication earthing and protection:
 - telecommunication overvoltage protection system:
 - operating principles
 - overvoltage and surge/spike suppression protection techniques
 - overvoltage protection devices
 - installation of overvoltage protection systems
 - earthing protection system encompassing:
 - components and arrangement of the multiple earth network (MEN) system
 - TELEX functional earth system
 - telecommunication system earthing single and multi-storey
 - communication earth system
 - protective earth barriers for segregation, cable tray, duct and metal equipment enclosures
 - electrical interference encompassing:
 - types – radio frequency interference (RFI) and electro-magnetic interference

(EMI)

- sources of interference
- techniques in reducing interference
- earthing cable shields
- earth testing instruments and procedures
- safety issues to be considered with earthing and bonding
- PABX fundamentals:
 - programming methods
 - configuration options
 - programming options
- switches, hubs and routers:
 - purpose and function
 - circuit configurations
 - connection arrangements
 - system protocols
- decoders:
 - purpose and function
 - circuit configurations
 - connection arrangements
 - system protocols
- fault finding and repair:
 - typical faults, their symptoms and cause
 - fault diagnosis procedures and testing
 - component replacement
 - system adjustments
- relevant manufacturer specifications
- relevant safe work method statements (SWMS)/job safety assessments or risk mitigation processes
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment

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

operational situations that replicate workplace conditions.

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

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- resources that reflect current industry practices in relation to diagnosing and rectifying faults in telecommunication apparatus and systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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