



Australian Government

**Assessment Requirements for UEEEC0061
Set up and adjust commercial radio
frequency (RF) transmission and reception
systems**

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Modification History

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

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 two separate occasions and include:

- 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
- dealing effectively with unplanned events
- demonstrating signal testing and signal analysis
- demonstrating the making of relevant adjustments
- determining live testing/measurement requirements
- identifying and accessing materials, tools, apparatus and testing devices
- identifying measurement parameters
- isolating circuits/machines/systems
- recording adjustment settings in accordance with workplace procedures
- selecting and terminating correct connectors to coaxial cable
- selecting and using appropriate test equipment to make measurements
- setting up and adjusting in accordance with transmission/reception requirements and manufacturer instructions
- using measurement results to inform system adjustments.

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:

- advanced electronic radio frequency (RF) testing and measuring devices and techniques
- antenna fundamentals, including selection and location of receiving and transmitting antennas, and test techniques

- antenna system measurements, including standing wave ratio (SWR), return loss and reflection coefficient
- antenna types, features and characteristics, including reciprocity, impedance matching, polarisation, gain, directivity and bandwidth
- calculation of path loss and received power
- electronic communications fundamentals
- fundamentals of cavity filters, ferrite isolators and their application to multiple-transmitter or multiple-receiver systems
- fundamentals of half-wave dipole and quarter-wave ground plane antennas
- impedance calculations, including the use of Smith charts
- impedance matching techniques, including the use of resonant lines, including $\frac{1}{4}$ wave stubs
- notion of decibel ratio (dB), including relative measurements (dBr), dB referenced to power (dBm) and voltage (dBuV) measurements
- radio wave propagation characteristics and modes of propagation in free space, including multiple-path effects
- relevant industry standards, codes and regulations
- 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
- RF connector fundamentals and common types
- RF measurement techniques, including time and frequency domain measurements
- transmission line fundamentals, including characteristic impedance (Z_0) line velocity, impedance matching, loss characteristics, line and waveguide types and line test/measurement techniques.

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 suitable simulated 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 commissioning commercial RF transmission and reception systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>