



Australian Government

UEEEEC0016 Develop engineering solutions to RF amplifier problems

Release: 1

UEEEEC0016 Develop engineering solutions to RF amplifier problems

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 develop engineering solutions to resolve problems with radio frequency (RF) amplifiers.

It includes developing engineering solutions to resolve problems with RF amplifiers. It also includes working safely, gathering and analysing data, applying problem-solving techniques, and developing and documenting solutions and alternatives.

Typical RF amplifier electronic problems are those encountered in meeting performance requirements and compliance standards, revising a RF amplifier electronic operating parameter and dealing with RF amplifier electronic malfunctions.

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

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to develop engineering solution for RF amplifier electronic problems

PERFORMANCE CRITERIA

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

1.1 WHS/OHS requirements and workplace procedures are identified and applied

1.2 WHS/OHS risk control measures and workplace procedures are followed

1.3 Extent of the RF amplifier problem is determined from performance specifications, situation reports and in consultation with relevant person/s

1.4 Activities are planned to meet scheduled timelines in consultation with person/s involved in the work

1.5 Effective strategies are formed to ensure solution development and implementation are carried out efficiently

2 Develop engineering solution for RF amplifier electronic problems

2.1 WHS/OHS risk control measures and workplace procedures for carrying out the work are followed

2.2 RF amplifier circuit device operation characteristics and applications are applied to developing engineering solutions to RF amplifier problems

2.3 Parameters, specifications and performance requirements in relation to RF amplifier problems are obtained in accordance with workplace procedures

2.4 Engineering approaches to resolving RF amplifier problems are analysed to provide most effective solutions

2.5 Unplanned situations are responded to in accordance with regulatory requirements and workplace procedures in a manner that minimises risk to personnel and

		equipment
	2.6	Quality of work is monitored against performance agreement and/or workplace procedures or industry standards
3	Test, document and implement engineering solution for RF amplifier electronic problems	
	3.1	Engineering solutions to RF amplifier problems are tested to determine their effectiveness and modified, as required
	3.2	Adopted engineering solution is documented, including instructions for implementation, that incorporates risk control measures to be followed
	3.3	Competent person/s required to implement solutions to RF amplifier problems is coordinated in accordance with regulatory requirements and workplace policies
	3.4	Justification for engineering solution used to solve RF amplifier problems is documented for inclusion in work/project development records in accordance with industry standards and 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.

Developing solutions to RF amplifier problems must include at least the following:

- four RF amplifier electronic problems

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH182A Develop engineering solutions to RF amplifiers problems.

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 UEEEC0016 Develop engineering solutions to RF amplifier problems

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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:

- understanding the extent of the radio frequency (RF) amplifiers electronic problems
- forming effective strategies for solution development and implementation
- obtaining RF amplifiers electronic parameters, specifications and performance requirements appropriate to each problem
- testing and solutions to RF amplifiers electronic problems
- documenting instruction for implementation of solutions that incorporate risk control measure to be followed
- documenting justification of solutions implemented in accordance with professional standards
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices.

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:

- RF amplifiers problems, including:
 - RF amplifiers:
 - selection of RF components
 - frequency response of amplifiers
 - gain levelling techniques
 - tuned amplifiers
 - techniques for impedance matching capacitive and transformer coupling
 - double-tuned circuits
 - tapped C and L circuits for Z-matching (use of S parameters and Smith charts)

- small signal RF amplifiers
- RF power amplifiers class A,B,C,D - low power (1W)/high power (kW) - typical circuits
- power combiners
- strip line circuit techniques
- transmission lines and antennas:
 - reflectometry minimum and maximum voltage and current values on a transmission line carrying an RF signal
 - transmission line loss measured in decibels
 - E field directions in relation to antenna elements
 - WHS/OHS standards, codes and regulations of Australian Communications and Media Authority (ACMA) for power, frequency and antenna gain
- engineering principles
- relevant industry standards
- relevant job safety assessments or risk mitigation processes
- 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 developing solutions to RF amplifiers problems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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