



Australian Government

ICTRFN801 Produce a radio link budget

Release: 1

ICTRFN801 Produce a radio link budget

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to analyse technical performance of fixed and mobile radio systems, and plan and calculate link budgets.

It applies to individuals working as telecommunications engineers who take responsibility for establishing layout of a digital radio system to minimise transmission loss and optimise system performance.

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

Unit Sector

Radio Frequency Networks

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Critically analyse suitability of radio systems	1.1 Critically analyse spectral efficiency of functional elements of mobile radio systems for determining optimal frequency utilisation 1.2 Critically analyse features of radio systems to evaluate effectiveness of a particular application 1.3 Compare features and specifications of antennas used in radio systems to assist with radio link budget 1.4 Report on suitability of radio systems, including recommendations to improve network performance
2. Calculate a radio link	2.1 Calculate path loss using variables in appropriate propagation

ELEMENT	PERFORMANCE CRITERIA
budget	models for a power link budget 2.2 Evaluate power link budget against allowable power margin specifications 2.3 Evaluate modulation types and spectral efficiency 2.4 Confirm radio power link budget achieves specified reliability
3. Complete evaluation and planning documentations	3.1 Complete an evaluation report on performance of radio systems with recommendations on system improvements 3.2 Document processes used to determine optimal power link budget for a radio system

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Writing	1.4, 3.1, 3.2	Uses clear, specific and industry-related terminology to complete and update specific workplace documentation and when presenting recommendations to relevant personnel
Oral Communication	1.4	Liaises with personnel about technical, operational and commercial matters using specific and relevant language, using listening and questioning techniques to confirm understanding
Numeracy	2.1, 2.2, 2.4	Analyses, synthesises and performs calculations using highly embedded mathematical information in a broad range of tasks and texts
Get the work done	1.1-1.3, 2.1-2.3	- Determines job priorities and works logically and systematically to undertake clearly defined and familiar tasks - Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world and understands potential of new technology - Uses systematic, analytical processes in complex situations, gathering relevant information and identifying and evaluating options against predetermined criteria

		Diagnoses faults in different situations, adapts procedures and modifies activities depending on operational contingencies, risk situations and environments
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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTRFN801 Produce a radio link budget	ICTRFN7182B Produce a radio link budget	Updated to meet Standards for Training Packages. Recoded and minor changes to PC's to meet AQF requirements.	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTRFN801 Produce a radio link budget

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Performance Evidence

Evidence of the ability to:

- analyse signal degradation characteristics of radio paths and calculate power budgets for various distances and antenna heights versus transmitted power
- research constraints imposed by mobile phone frequency allocations and simulate carrier to interference radiation patterns around a cell site
- create evaluation report on radio system performance
- document processes used to determine power link budget.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain high frequency (HF), very high frequency (VHF), ultra high frequency (UHF) and microwave receiving techniques
- summarise modulation methods:
 - AM
 - FM
 - digital
- outline multiplexing systems
- summarise operation of transmitters and receivers
- explain organisational policies and procedures
- summarise personal safety issues
- explain propagation methods
- summarise radio communications systems
- weigh factors affecting radio frequency (RF) path loss
- summarise RF technologies.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Radio Frequency Networks industry and include access to:

- a telecommunications operations site
- mobile telephony devices and equipment
- networked computers and relevant software.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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