



Australian Government

Department of Education, Employment and Workplace Relations

ICTTC096D Conduct field tests of radio and wireless networks

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the requirements for a person to make field tests on mobile and radio telephony systems to assist in optimising system operation. Could include Packet based information transfer supporting a wide range of services Utilising end to end Quality of Service (QoS) capability as described by the ITU-T Next Generation Networking (NGN) Study group 13 definition.

This unit applies to both cellular and trunked radio systems.

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

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Application of the Unit

Not applicable.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Nil

Nil

Employability Skills Information

This unit contains employability skills.

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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where **bold italicised** text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

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Element	Performance Criteria
1 Plan tests	<p>1.1 Need for tests and the particular types of tests to be undertaken are identified</p> <p>1.2 Area to be tested is clearly identified</p> <p>1.3 Location and number of tests are determined</p> <p>1.4 A pre determined route is established</p> <p>1.5 Current data is obtained from a print out from the switch(es)</p>
2 Obtain tools	<p>2.1 Appropriate tools/test equipment are identified and obtained</p> <p>2.2 Tools and test equipment are checked for accuracy and calibration organised where required</p> <p>2.3 Checks are conducted to ensure that built in tests associated with particular test equipment have run and action taken in accordance with manufacturers specifications in the event of failure</p>
3 Conduct tests	<p>3.1 Tests specific to equipment, area and test purpose are conducted in accordance with specification</p> <p>3.2 Sufficient test calls are made to achieve an adequate statistical sample</p> <p>3.3 Validity of tests is ensured by comparison with</p>

- current and previous data as required
- 3.4 Work is conducted in a manner which is safe to self, fellow workers and the public at large
- 4 **Analyse test results**
 - 4.1 Test results are analysed against specified standards
 - 4.2 Variations to standards are investigated and reasons identified
 - 4.3 Faults are diagnosed and either repaired or escalated in accordance with enterprise policy
 - 4.4 Design faults are documented and recommendations for change are submitted to the appropriate enterprise area
 - 4.5 Service degradation is noted and action initiated to optimise or reconfigure equipment in accordance with specifications and/or enterprise directions
- 5 **Undertake administrative tasks**
 - 5.1 Test results are recorded on the appropriate proforma and/or data base
 - 5.2 Results are distributed in accordance with enterprise policy
 - 5.3 Tools and test equipment is checked and returned for recalibration or stored in accordance with enterprise policy
 - 5.4 Transporting of tools and test equipment in suitable protective casing is organised where appropriate

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Select from the following list to suit the learning and assessment context

Codes refer to the Skills and Knowledge Register in Volume 3 of this Training Package that has detailed content guidelines for each code outlined.

CI410 Communication 4

CO410 Computer Skills 4

CS410 Customer Relations 4

DI410 Digital Theory 4

DI430 Digital Radio 4

EN420 Enterprise Information Systems 4

EN430 Enterprise Organisational Policy 4

ET420 Amplifiers 4

IN410 Interpersonal Relationships 4

IN420 Teamwork 4

MA410 Basic Mathematics 4

NT410 Emerging Network Technologies

OH410 Occupational Health and Safety 4

PE320 Remote Work

PS410 Plans and Specifications 4

PS420 Basic Building Trades 4

RA410 Antennas 4

RA420 Radio Frequency Theory and Hazards 4

TE460 Pager Operation 4

TE480 CMTS 4

TF420 Test Analysis and Diagnosis 4

TO410 Use of Tools 4

TO420 Anti-static Procedures 4

TR430 Modulation Theory 4

TR460 Spectrum Management 4

Required knowledge

The relevant required knowledge is articulated in the above guidelines contained in the Skills and Knowledge Register included in this Training Package.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the following is essential:

Mentor/assessor observes candidate - and candidate delivers at least three oral reports to mentor/assessor - planning relevant tests, including:

Driving and navigation capability

Identification of tests required and likely outcomes

Interaction with enterprise staff, customers and contractors.

Mentor/assessor observes candidate obtaining and using test tools, including GPS system, lap top computer, test software and hand held phone.

Mentor/assessor observes candidate:

Complying with all related occupational health and safety requirements and work practices

Reading, interpreting and using equipment/system manuals and specifications and relevant enterprise policy and documentation.

Candidate submits hard copy of at least three test result analyses and reports detailing outcomes with recommendations as to action to be taken.

Mentor/assessor observes candidate's customer focus and consideration of customer needs.

Candidate submits at least three sets of hard copy test results, recorded on the appropriate proforma and/or database.

Context of and specific resources for assessment

Assessment must ensure:

A workplace conducting the operations covered by this competency unit, equipment and resources relevant to the context of the work (See Range Statement) and support from a competent supervisor or mentor.

OR

A simulated environment with similar provisions which conforms to the Assessment Guidelines.

Guidance information for assessment

Access must be provided to appropriate learning and assessment support when required.

Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed.

In all cases where practical assessment is used it will be combined with targeted questioning to assess underpinning knowledge.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. **Bold italicised** wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Traditional network technology boundaries	Are now being crossed with technologies such as Asynchronous Transfer Mode (ATM), Digital European Cordless Telephone (DECT), ISDN, and intelligent networks and other emerging network technologies
Network systems and products	Vary considerably across the specific technologies and are usually unique to a particular vendor
Technologies	Can be described in broad terms as: switching, transmission, radio (fixed and mobile), video and satellite. Services could fall within the general heading of Next Generation Networks delivering services such as Voice over IP, Multimedia, data transfer, video etc.
Transmission medium	May be: copper cable, coaxial cable, optic fibre cable, radio, video, satellite
Network Architecture	Can be described as: Analogue (to be phased out by 2000), PDH (plesiochrynous digital hierarchy), SDH (synchronous digital hierarchy), ATM
Network hierarchy	Can be described as backbone, transport, broadband, data, HLS, CLS

Tools and test equipment	May include: GPS System, lap top computer, motor vehicle, in vehicle and hand held phone, test software, fixed antenna on vehicle, frequency plans, geographic maps
Test equipment calibration	Test equipment self calibrates, but primary/secondary calibration is undertaken by appropriate specialists
Types of tests undertaken	Include: integration, quality of signal, comparison with other carriers, optimisation, coverage
Tests	Are undertaken in accordance with specification and/or enterprise policy but can be varied to suit the conditions and the uncertainty surrounding validity of results
Reason for tests	May include: validation e.g. base station, optimisation, comparison, coverage confirmation, signal level
Relevant legislation, codes, regulations and standards include:	International Standards ISO 9000 and 9001 ACMA Standards TS 14 ITU recommendations Occupational Health and Safety Privacy Act Private property law Spectrum management

Unit Sector(s)

Not applicable.