



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN6036A Undertake qualification testing of new or enhanced equipment and systems

Release: 1

ICTTEN6036A Undertake qualification testing of new or enhanced equipment and systems

Modification History

Not Applicable

Unit Descriptor

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| Unit descriptor | <p>This unit describes the performance outcomes, skills and knowledge required to inspect and test internal telecommunications network equipment not previously installed in an Australian network. It involves assessing its suitability and compliance with local regulations and conditions for the carrier or asset owner.</p> <p>It involves processes for checking specifications, complex testing procedures and administrative tasks.</p> <p>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.</p> |
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Application of the Unit

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| Application of the unit | <p>Field officers, technicians or technical supervisors from carriers, contractors or other service providers apply the skills and knowledge in this unit to verify the compliance of new equipment or systems to Australian standards.</p> <p>This unit applies to installation of both new, additional and replacement equipment. It may apply to switching, transmission, broadband, internet protocol (IP) networks, optical and radio networks.</p> |
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

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| Prerequisite units | | |
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Employability Skills Information

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| Employability skills | This unit contains employability skills. |
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Elements and Performance Criteria Pre-Content

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| 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

| ELEMENT | PERFORMANCE CRITERIA |
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| 1. Ensure conformity of international design to Australian standards | 1.1. Assess original international design to verify compliance with Australian relevant legislation, codes, regulations and standards 1.2. Reconfigure international design in consultation with customer 1.3. Rewrite design specifications to include configuration amendments |
| 2. Plan and establish test regime | 2.1. Plan type and number of tests to ensure full trial of new or enhanced design and greatest coverage for minimal tests 2.2. Plan and establish test environment to ensure total validity of chosen tests 2.3. Design test regime of proposed system to test impact on existing systems 2.4. Confirm test regime in consultation with planners and verify that test equipment meets required standards |
| 3. Undertake tests | 3.1. Conduct and document tests including live system tests in logical and sequential order to planned test regime 3.2. Negotiate problems experienced during the test with system experts or designers to plan contingency activity according to enterprise policy 3.3. Prepare and submit trouble reports according to enterprise policy |
| 4. Analyse test results | 4.1. Analyse test results against design specifications and planned outcomes 4.2. Prepare a report referring major deficiencies to designers with recommendations for design change 4.3. Analyse minor variances, plan solutions and document changes to specifications |
| 5. Retest design changes | 5.1. Implement design and specification changes and conduct further tests as required 5.2. Analyse test results to verify compliance with updated design specifications 5.3. Document results of tests according to enterprise policy |

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- analytical skills to:
 - assess compatibility and interoperability with existing system
 - interpret test equipment settings and readings
- communication skills to liaise with internal personnel, technical staff, manufacturers and vendor engineers on technical, operational and business related matters
- literacy skills to:
 - interpret technical specifications and related documentation
 - write reports and recommendations
- numeracy skills to make calculations and necessary calibration changes
- planning and organisational skills to plan, prioritise and monitor own work
- technical skills to:
 - interpret engineering specifications
 - perform high level and complex testing
 - test and evaluate new technologies

Required knowledge

- Australian standards applicable to system and equipment compliance
- connections to carrier infrastructure or equipment
- design criteria
- network and equipment tests for compliance
- network architectures
- relevant international standards

Evidence Guide

| EVIDENCE GUIDE | |
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| <p>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.</p> | |
| Overview of assessment | |
| Critical aspects for assessment and evidence required to demonstrate competency in this unit | <p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • apply Australian standards to international designs • negotiate with equipment vendor and identify specific requirements • configure and set up test regimes • identify and conduct tests including live system tests and interpret and analyse results • approach problem diagnosis systematically, eliminating causes • retest design changes • prepare report, including deficiencies, analysis and recommendations. |
| Context of and specific resources for assessment | <p>Assessment must ensure:</p> <ul style="list-style-type: none"> • test site where qualification testing of equipment and systems may be conducted • equipment currently used in industry • relevant Australian and international standards, codes, design specifications, manuals and reference materials. |
| Method of assessment | <p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> • oral report and direct observation of the candidate establishing a test regime • direct observation of the candidate undertaking tests including live system test on equipment and systems • review of reports completed by the candidate for different equipment types, test results and situations, analysing results with recommendations and supporting reasons • oral or written questioning of the candidate to assess knowledge of qualification and testing procedures, types of systems and tests. |
| Guidance information for | Holistic assessment with other units relevant to the |

EVIDENCE GUIDE**assessment**

industry sector, workplace and job role is recommended, for example with:

- ICTNPL6046A Undertake network performance analysis.

Aboriginal people and other people from a non-English speaking background may have second language issues.

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 required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.

Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement**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.

Relevant legislation, codes, regulations and standards may include:

- Australian Communications and Media Authority (ACMA) standards TS 14
- Australian electrical standards
- International Standards ISO 9000 and ISO 9001
- International Telecommunications Union (ITU)

| RANGE STATEMENT | |
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| | recommendations <ul style="list-style-type: none">• occupational health and safety (OHS)• Telecommunications Act and associated codes. |

| RANGE STATEMENT | |
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| <i>Reconfigure international design</i> may involve: | <ul style="list-style-type: none"> • conforming to: <ul style="list-style-type: none"> • Australian regulation, codes and standards • international standards. |
| <i>Tests</i> may include: | <ul style="list-style-type: none"> • network tests: <ul style="list-style-type: none"> • bandwidth • latency • packet loss rate • quality of service (QoS) • redundancy • uploads and downloads rate • switching tests: <ul style="list-style-type: none"> • blocking • call rate • congestion • drop out rate • functionality • QoS • recovery rate • transmission tests: <ul style="list-style-type: none"> • distortion • interference • optical transmission • radio transmission • signal to noise ratio • transmitted power measurements. |
| <i>Test environment</i> may involve: | <ul style="list-style-type: none"> • laboratory situation with simulated test conditions • trialling in a model network with actual test conditions. |
| <i>Test equipment</i> may include: | <ul style="list-style-type: none"> • communication system analysers • global system for mobiles (GSM) spectrum frequency synthesizer • laser source • microwave link analyser • modulator tester • network analyser • optical fibre power meters • optical time domain reflectometer (OTDR) |

| RANGE STATEMENT | |
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| | <ul style="list-style-type: none"> • pattern generators • power meters • protocol analyser • radio frequency (RF) band noise meter • RF microwave test sets • RF sweep tester • spectrum analysers • sweep test coaxial and wave guide antenna systems. |
| <i>Contingency activity</i> may refer to: | <ul style="list-style-type: none"> • P1 blocking: <ul style="list-style-type: none"> • referred to experts or trouble report issued • submitted to designers • P2 customer perception problems: <ul style="list-style-type: none"> • test continues • trouble report sent to designers • P3 identifiable problem: <ul style="list-style-type: none"> • work around problem or make minor changes • P4 minor: <ul style="list-style-type: none"> • usually specification error • change and document. |

Unit Sector(s)

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| Unit sector | Telecommunications |
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Co-requisite units

| Co-requisite units | | |
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Competency field

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| Competency field | Telecommunications networks engineering |
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