



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN3056A Install telecommunications network equipment

Release: 1

ICTTEN3056A Install telecommunications network equipment

Modification History

Not Applicable

Unit Descriptor

<p>Unit descriptor</p>	<p>This unit describes the performance outcomes, skills and knowledge required to effectively install and test telecommunications network equipment. It includes processes for checking plans, obtaining and proper handling of equipment and supplies.</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

<p>Application of the unit</p>	<p>Field officers, technicians or technical supervisors employed by carriers, contractors or other service providers apply the skills and knowledge in this unit.</p> <p>This unit may apply to switching, transmission and radio networks and various transmission paths, including cable, optical fibre, radio, microwave and satellite. The unit applies to installation of new, additional and replacement equipment.</p>
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	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

ELEMENT	PERFORMANCE CRITERIA
1. Plan for installation of telecommunications network equipment	1.1. Prepare for given work according to relevant occupational health and safety (OHS) and environmental requirements 1.2. Notify customer to arrange site access if necessary 1.3. Assess existing and potential site hazards 1.4. Verify location of proposed network equipment installation according to the appropriate plans obtained from authorised personnel 1.5. Develop installation plans to ensure minimal disruption to the workplace and according to relevant legislation, codes, regulations and standards 1.6. Obtain tools and test equipment required for safe work practice 1.7. Notify affected parties of possible network outage if required
2. Install network hardware and cabling	2.1. Install network equipment according to the plan and manufacturer's instructions using safe industry practices 2.2. Insert equipment cards and modules 2.3. Install all interconnecting cables to specification 2.4. Confirm service interruption is within limits agreed with the customer 2.5. Document all installation drawings for the customer
3. Install equipment accessories	3.1. Install alarms according to instruction manuals and to specification 3.2. Install operations administration and maintenance system according to specification 3.3. Install communication facilities for operational staff according to specification, taking into account any special needs of the site and the operational staff 3.4. Install operator communication facilities according to needs and to specification
4. Configure and test the system	4.1. Install software and configuration instructions according to system specifications if required 4.2. Test to verify the system performance according to customer requirements

ELEMENT	PERFORMANCE CRITERIA
	4.3.Recommend any possible changes and confirm with customer 4.4.Record all test results
5. Clean up worksite and complete documentation	5.1.Remove and dispose of installation waste and debris from worksite according to environmental requirements 5.2.Restore changes made to the work area during installation to the customer's satisfaction 5.3.Complete all installation documents and present to the customer 5.4.Declare asset ready for commissioning and integration 5.5.Notify the customer and obtain signoff

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- analytical skills to:
 - interpret test equipment settings and readings
 - interpret design specifications including:
 - circuit diagrams
 - plans
 - specifications
- communication skills to liaise with customers to ensure requirements are known and can be met within timeframes
- literacy skills to interpret technical specifications and related documentation
- numeracy skills to make calculations and necessary calibration changes
- planning and organisation skills to make site access and equipment delivery arrangements
- problem solving to account for unexpected faults or equipment incompatibilities
- technical skills to:
 - apply antistatic techniques for material and equipment handling
 - correctly handle, connect and calibrate test equipment
 - install cables including:

REQUIRED SKILLS AND KNOWLEDGE

- appropriate cable separation
- minimum bending radii
- provision of spare length
- terminate cables including:
 - stripping
 - conductor identification and fanning
 - cleaning of optical fibres connectors
 - provision of spare length
- use hand tools for mounting and securing equipment

Required knowledge

- cabling types, connectors and cabling structures
- connections to carrier infrastructure or equipment
- electrical and or optical properties to be measured
- overview knowledge of network and transmission equipment
- power requirements and electrical safety
- typical performance parameters and faults that may be encountered in customer equipment and related connection and transmission media
- various test equipment types suitable for tests to be made
- waste handling and environmental compliances in its disposal

Evidence Guide

EVIDENCE GUIDE	
<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"> • plan and install network hardware and cabling according to equipment/system manuals and specifications • configure and test installation • verify cable continuity • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	<p>Assessment must ensure:</p> <ul style="list-style-type: none"> • sites where installation of telecommunications network equipment may be conducted • use of network testing equipment currently used in industry • relevant regulatory and equipment documentation that impact on telecommunications network equipment installation activities.
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"> • direct observation of the candidate installing telecommunications network equipment • review of reports completed by the candidate for different scenarios and situations • oral or written questioning to assess knowledge of planning, types of systems.
Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:</p> <ul style="list-style-type: none"> • ICTSUS4184A Install and test power saving hardware • ICTTEN4051A Install configuration programs on PC based customer equipment • ICTTEN4198A Install, configure and test an internet

EVIDENCE GUIDE

	<p>protocol (IP) network</p> <ul style="list-style-type: none"> • ICTTEN4199A Install, configure and test a router. <p>Aboriginal people and other people from a non-English speaking background may have second language issues.</p> <p>Access must be provided to appropriate learning and assessment support when required.</p> <p>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.</p> <p>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.</p> <p>Where applicable, physical resources should include equipment modified for people with special needs.</p>
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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 OHS and environmental requirements may relate to:

- identifying other services including power and gas
- need for decommissioning and isolate worksite and lines prior to commencement

RANGE STATEMENT	
	<ul style="list-style-type: none"> • personal protective clothing: <ul style="list-style-type: none"> • earmuffs • gloves: <ul style="list-style-type: none"> • plastic • rubber • leather • head protection • kneepads • masks • protective suits • safety boots • safety glasses • safety equipment: <ul style="list-style-type: none"> • flashing lights • gas and other hazard detection equipment • safety barriers • trench guards • warning signs and tapes • witches hats • safe working practices, such as the safe use and handling of: <ul style="list-style-type: none"> • asbestos • chemicals • materials • tools and equipment • work platforms • special access requirements • suitable light and ventilation • environmental considerations: <ul style="list-style-type: none"> • clean-up protection • stormwater protection • waste management.
Hazards may include:	<ul style="list-style-type: none"> • building debris • earth potential rise (EPR) • glass fibre • live power lines • manual handling • mud and water

RANGE STATEMENT	
	<ul style="list-style-type: none"> • natural and other gas build up • needle stick injury • optical cable • radio frequency (RF) equipment emitting radiation • remote power feeding services • vermin.
<i>Network equipment</i> may include:	<ul style="list-style-type: none"> • customer premises equipment (CPE) equipment: <ul style="list-style-type: none"> • cable/Pay TV • closed circuit TV (CCTV) • free to air TV • intercom • office equipment • security equipment • computer network: <ul style="list-style-type: none"> • gateways • network managers • router • servers • switches • voice over internet protocol (VoIP) • wireless LAN • multiplexing and radio: <ul style="list-style-type: none"> • fixed • mobile • optical equipment • RF • switching • transmission • voice switching units.
<i>Authorised personnel</i> may include:	<ul style="list-style-type: none"> • consultant • contractor • network administrator • project manager.
<i>Relevant legislation, codes, regulations and standards</i> may include:	<ul style="list-style-type: none"> • Australian Communications and Media Authority (ACMA) regulations relating to functional earthing • ACMA standards TS 14

RANGE STATEMENT	
	<ul style="list-style-type: none"> • AS Communications Cabling Manual (CCM) Volume 1 • AS/NZS 3000:2007 • AS/NZS 3080:2003 • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS IEC 61935.1:2006 • AS/NZS IEC 61935.2:2006 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • Australian Construction Industry Forum (ACIF) standards and codes • Australian standards applying to radiation hazards • AS/NZS/ISO 9001:2000 • cabling security codes and regulations • environmental protection acts • heritage legislation • International Telecommunications Union (ITU) recommendations • OHS Acts • State/Territory and Federal environment Acts • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.
Tools may include:	<ul style="list-style-type: none"> • anti-static testers • cable strippers • cable testers • cable tie tensioners • crimpers • hammers • humidity and temperature testers • insulation displacement tools • jigsaws • level • load testers • mechanical lifts/hoists • pliers • power tools • screwdrivers • soldering irons

RANGE STATEMENT	
	<ul style="list-style-type: none"> • spanners • tape measures • tension wrenches • termination tools • trolleys • wire strippers.
<i>Test equipment</i> may include:	<ul style="list-style-type: none"> • adaptors • analog transmission measuring sets • communication system analysers • digital analysers • error meter • frequency measurer • global system for mobile communication (GSM) spectrum frequency synthesiser • lap top computer • laser source • level meter • light meter • microwave link analyser • modulator tester • multimeters • optical attenuators • optical fibre power meters • oscillator • oscilloscopes • optical time domain reflectometer (OTDR) • pattern generators • power meters • RF band noise measurer • RF microwave test sets • RF sweep tester • spectrum analysers • sweep test coaxial and wave guide antenna systems • standing wave ratio (SWR) meters • transmitter/receiver filter combiner equipment • video tester.
<i>Interconnecting cables</i> may include:	<ul style="list-style-type: none"> • communications cables: <ul style="list-style-type: none"> • Category 5 or 6 • coaxial cable

RANGE STATEMENT	
	<ul style="list-style-type: none"> • data cables • jumper cables • optical patch cords • control cables • power cables • signal cables.
<i>Test</i> may include:	<ul style="list-style-type: none"> • bit error rate (BER) • continuity • end to end • frequency response • functionality test • gain and attenuation • loop back • signal to noise ratio • speed.

Unit Sector(s)

Unit sector	Telecommunications
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Telecommunications networks engineering
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