



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN4102A Repair telecommunication system faults

Release: 1

ICTTEN4102A Repair telecommunication system faults

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to diagnose and repair faults in telecommunications systems from a customer report or a maintenance schedule. Hardware and software system faults may be in optical, computer, radio, satellite, security and radio frequency identification (RFID) systems found in customer and service provider Access Networks. 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.
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Application of the Unit

Application of the unit	Field officers, technicians or technical supervisors from carriers, contractors, other service providers and employees working in small to medium enterprises apply the skills and knowledge in this unit.
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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. Prepare for equipment repairs	1.1. Obtain relevant legislation, codes, regulations and standards for compliance when conducting work 1.2. Identify hazards, make work site safe according to relevant safety legislation and company work practices and use personal protective equipment 1.3. Notify customer and other appropriate personnel of work and arrange for site access and security where required 1.4. Obtain fault details to determine type of system fault 1.5. Determine the type of repair required according to enterprise guidelines, site requirements and type of equipment, and arrange for additional technical support as appropriate 1.6. Confirm if warranties and service agreements covering identified repairs exist 1.7. Obtain tools and necessary hardware and ensure that replacement parts and material is delivered to the worksite at the required time
2. Repair fault	2.1. Follow occupational health and safety (OHS) and environmental requirements when carrying out repair or replacement tasks 2.2. Notify appropriate personnel of service disruption and remove network equipment from service 2.3. Diagnose the fault and carry out repair work on equipment according to manufacturer's or enterprise procedures 2.4. Test equipment to manufacturer's specifications following repairs and return to live operation for testing overall performance
3. Complete repair work documentation and administrative tasks	3.1. Notify customer and other appropriate personnel of completion of repair work according to enterprise guidelines 3.2. Record any changes to equipment and store according to enterprise guidelines 3.3. Dispose of waste and debris from worksite according to environmental requirements and enterprise guidelines 3.4. Complete administrative tasks and make recommendations for improvements under quality assurance system

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication skills to liaise with customers on technical and operational matters and raise OHS issues
- literacy skills to:
 - incorporate technical language into written tasks to prepare report on recommendations to rectify faults
 - interpret technical documentation and standards
- numeracy skills to interpret technical data, such as equipment specifications
- problem solving skills to diagnose faults
- research skills to access technical information and sources to assist in fault identification
- safety awareness skills to:
 - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
 - select and use required personal protective equipment conforming to industry and OHS standards
 - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
 - select and use appropriate methods for fault identification and rectification
 - use hand tools

Required knowledge

- anti static procedures
- enterprise policies and procedures
- fault diagnosis techniques
- general fault-finding techniques and test equipment
- OHS
- product knowledge
- safety requirements and standards
- telecommunications network and equipment fault types and rectification
- telecommunications network and equipment types
- test equipment

Evidence Guide

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.

Overview of assessment

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

Evidence of the ability to:

- diagnose and identify faults methodically using fault history and recognition of likely causes
- repair telecommunication equipment according to manufacturer's or enterprise procedures applying related OHS requirements and work practices
- test the equipment following repairs and put back into commission.

Context of and specific resources for assessment

Assessment must ensure:

- sites on which diagnosis and repair of communication equipment may be conducted
- use of test equipment currently used in industry
- manufacturer's technical documentation.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct observation of the candidate diagnosing faults in communications equipment, ranging from common to complex
- review of documentation completed by the candidate
- oral or written questioning to assess required knowledge.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICTTEN4081A Locate, diagnose and rectify faults
- ICTTEN4086A Undertake routine maintenance of the telecommunications network.

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

EVIDENCE GUIDE

	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.
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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 legislation, codes, regulations and standards may include:

- Australian Communications Industry Forum (ACIF) standards and codes AS/ACIF S008:2006, and AS/ACIF S009:2006
- 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

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	• AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • Australian building codes and regulations • cabling security codes and regulations • compliance with appropriate Australian Communications and Media Authority (ACMA) technical standard requirements for underground, aerial, Category 5, 6, 6A, 7 or 7A and unshielded twisted pairs (UTP) • Environmental Protection Acts • fire regulations • noise abatement and heritage legislation • OHS • relevant international standards • Trade Practices Act.
Hazards may include:	• building debris • earth potential rise (EPR) • glass fibres • live power lines • manual handling • natural gas and other gas build up • needle stick injury • optical fibre cable may contain hazardous light • radio frequency (RF) equipment emitting radiation • remote power feeding services which operate at above telecommunications network voltage (TNV).
Personal protective equipment may include:	• electrical isolators • gas detectors • personal protective clothing: • earmuffs • face masks • gloves • head protection • kneepads • safety boots • safety glasses.
Appropriate personnel may	• asset manager

RANGE STATEMENT	
include:	• network operations centre (NOC) • on site technical staff • project manager • specialist technical support staff.
<i>System fault</i> may include:	• hardware • internet protocol (IP) network • optical system • radio system • software • switching • transmission.
<i>Type of repair</i> may include:	• calibration • hardware adjustment: • alignment • clock oscillator • gain • hardware replacement: • component • module • sub-assembly • reconfiguration: • hardware • software • system reconfiguration • system reload.
<i>Tools</i> may include:	• anti-static work mat • anti-static wrist strap • crimping tools • PC board or subrack removal tool • pliers • screwdrivers • sockets • soldering iron • spanners • terminating tools • testing tools.
<i>OHS and environmental requirements</i> may relate to:	• decommissioning and isolating worksite and lines prior to commencement • gas and other hazard detection equipment

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	- identifying other services, including power and gas - safety equipment: - flashing lights - safety barriers - trench guards - warning signs and tapes - witches hats - safe working practices, such as the safe use and handling of: - asbestos - chemicals - materials - tools and equipment - work platforms - special access requirements - suitable light and ventilation - environmental considerations: - clean-up protection - noise, dust and clean-up management - stormwater protection - waste management.
Test may include:	- bit error ratio (BER) - electrical - equipment self diagnostics - optical power level - ping - protocol analysis - remote test - return loss - RF power level - signal level - signal to noise ratio - software diagnostic - testing function of: - complete system - individual equipment sections - transmission path - test on network equipment functions

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	optical time domain reflectometer (OTDR).
Administrative tasks may relate to:	- checking correct labelling of all equipment and amending where required - completing job orders and submitting to appropriate enterprise organisational unit - completing test sheets according to specification and logging test instrument usage - following quality control procedures - handing over installation briefs, documents and equipment manuals to operational staff - recording test results and updating appropriate data bases - updating design specifications and returning to design area as required by enterprise requirements.
Quality assurance may include:	- acting on logs, reports and other data to guide ongoing quality improvements - updating logs and reporting on installation or maintenance activities.

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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