



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN5083A Locate, diagnose and rectify complex faults

Release: 1

ICTTEN5083A Locate, diagnose and rectify complex faults

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to locate, diagnose and rectify complex faults in telecommunications networks and equipment. It includes identification of faults in upstream or downstream services that may require involvement of third party providers. 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	Telecommunications officers, installers, maintenance staff and manufacturer or equipment specialists apply the skills and knowledge in this unit. It may be applied by those in advisory roles and technical rectification roles. Networks include cabling, customer premises equipment (CPE), Access, telephony, broadband deployment, local area networks (LAN), wide area networks (WAN) and internet protocol (IP) networks for enterprise and customer systems and installations.
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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 to locate and rectify complex faults	1.1. Prepare for given work according to relevant legislation, codes, regulations and standards 1.2. Notify client to arrange access to site 1.3. Obtain report of any action taken by first fault repairer and subsequent result 1.4. Obtain fault history to establish any fault patterns 1.5. Obtain all available data on the system equipment to assist with fault diagnosis 1.6. Develop strategies for identification and repair in discussion with other engineering and technical personnel 1.7. Obtain tools and test equipment relevant to the identified system type and fault 1.8. Set up equipment according to manufacturer's specifications and reconfigure as required
2. Locate and diagnose faults	2.1. Use methodical work practice suitable for system and problem type to identify system fault 2.2. Isolate and test fault progressively to remove likely variables from assessment and record test results 2.3. Refer faults that may involve third party services if required 2.4. Diagnose fault in the shortest time possible with minimum inconvenience to other client activity 2.5. Provide regular progress reports to client 2.6. Raise fault identification to a national support level within a specified timeframe if required 2.7. Undertake guidance from national support in fault diagnosis as required 2.8. Negotiate any necessary system downtime with the client
3. Rectify fault	3.1. Determine options to rectify fault including any system downtime and present to client for decision 3.2. Rectify fault totally, partially or provide temporary solution 3.3. Replace or repair faulty parts or equipment according to service agreement 3.4. Reprogram equipment as required 3.5. Dismantle and remove any temporary service in a safe and efficient manner where appropriate

ELEMENT	PERFORMANCE CRITERIA
	3.6. Perform repair under national support guidance as required 3.7. Perform routine checks to identify likelihood of further or likely problems 3.8. Rectify any further problems identified or bring to the attention of the customer for decision on further action necessary
4. Clean up worksite and complete records	4.1. Produce a report on fault diagnosis and rectification 4.2. Remove and dispose of waste and debris from worksite according to environmental requirements 4.3. Ensure changes made to the work area during fault repair are restored to the client's satisfaction 4.4. Complete all records , explain and justify faults and rectification action taken

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication skills to:
 - listen and liaise with clients on technical and operational matters
 - negotiate with other repairers and support staff
 - raise occupational health and safety (OHS) matters
- literacy skills to:
 - explain and justify faults and rectification actions
 - incorporate technical language into written tasks such as records and reports
 - interpret technical documentation and standards
- numeracy skills to interpret technical data, such as specifications of equipment operations
- problem solving skills to apply methodology in fault diagnosis
- research skills to access technical information and sources to assist fault identification
- safety awareness skills to:
 - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities

REQUIRED SKILLS AND KNOWLEDGE

- 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

Required knowledge

- fault escalation procedures
- fault finding techniques and of test equipment
- fault types and rectification
- safety requirements and standards
- service agreements
- types of networks and equipment:
 - Access
 - broadband deployment
 - cabling
 - CPE
 - IP networks for enterprise and customer systems and installations
 - LAN
 - telephony
 - WANs
- workplace environment and practices

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:

- methodically analyse fault details and diagnose potential faults
- conduct advanced tests to determine complex network fault
- isolate and locate the fault logically
- rectify faults using appropriate organisational procedures and OHS requirements
- comply with all related OHS requirements and work practices.

Context of and specific resources for assessment

Assessment of this unit requires:

- sites on which fault diagnostics may be conducted
- use of testing equipment currently used in industry
- relevant regulatory and equipment documentation that impact on complex fault repairs.

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 applying safety aspects to the locating and rectifying the faults
- oral or written questioning of the candidate to assess knowledge of types of faults and implications
- evaluation of report prepared by the candidate including test result interpretation
- written reports prepared by the candidate outlining fault rectification methodologies and recommendations.

Guidance information for assessment

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

- ICTTEN5058A Acceptance test new systems and equipment
- ICTTEN5059A Commission telecommunications

EVIDENCE GUIDE

	network equipment • ICTTEN5092A Undertake planned outage management. 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.
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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 Communications Cabling Manual (CCM) Volume 1

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	• AS/NZS 3000:2007 • AS/NZS 3080:2003 - Telecommunications Installations - Generic cabling for commercial premises, clause 10.3.2 includes: • colour codes used to identify the various types of fibre • signals these cables would normally carry • AS/NZS 3084:2003 • AS/NZS 3085.1:2004 • AS/NZS ISO/IEC 14763.3:2007 • AS/NZS ISO/IEC 15018:2005 • AS/NZS ISO/IEC 24702:2007 • cabling security codes and regulations. • OHS • regulated or industry codes of practice including appropriate Australian Communications and Media Authority (ACMA) technical standards • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006.
Client may include:	• enterprise personnel • fault centre • network operations centre staff • reporter of fault • site manager.
System equipment may include	• asynchronous transfer mode (ATM) or frame relay (FR) switch • carrier network • CPE network • gateways • multiplexing • optical transmission • radio network equipment • routers • servers • transmission paths: • cable • microwave • optic fibre • radio

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	• satellite • wireless broadband.
<i>Other engineering or technical personnel</i> may include:	• carrier or service provider staff • electrical contractor • equipment manufacturer • equipment supplier • external customer • on site operation staff.
<i>Tools</i> may include:	• adaptors • laser source • light meter • optical attenuators • transmitter or receiver filter combiner.
<i>Test equipment</i> may include:	• analogue transmission measuring sets • cable tester • digital analysers • error meter • frequency measurer • global system for mobiles (GSM) spectrum frequency synthesiser • microwave link analyser • modulator tester • multimeters • network management set • optical fibre power meters • optical time domain reflectometer (OTDR) • pattern generators • portable computer • power meters • protocol analysers • radio frequency (RF) band noise measurer • RF microwave test sets • RF sweep tester • spectrum analysers • sweep tester for coaxial • standing wave ratio (SWR) meters • time domain reflectometer (TDR) • video tester.
<i>System fault</i> may include:	• 'out of specification' faults • dynamic loops

RANGE STATEMENT	
	• intermittent performance problems • latency • network dropout • severe cable or transmission path damage • system configuration problems • system equipment failure or partial failure • traffic congestion.
Test may include:	• bit error rate • equipment self diagnostics • protocol analysis • return loss • signal level: • electrical • optical • RF • signal to noise • TDR • test data (ping) • testing functionality of: • individual equipment • system • transmission paths, including egress or ingress via third party provider services.
Services may include:	• ATM interface • fibre to premises equipment • hybrid fibre coaxial (HFC) cable and modem • ISDN (PRA) interface unit • microwave equipment • satellite receiver • synchronous digital hierarchy (SDH) interface • telephone line • wireless modem • wireless transceiver equipment.
Environmental requirements include:	• clean-up management • dust • noise • waste management.
Records may include:	• service agreement • trouble ticket

RANGE STATEMENT

	• work order • written site log.
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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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