



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN4081A Locate, diagnose and rectify faults

Release: 1

ICTTEN4081A Locate, diagnose and rectify faults

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	<p>This unit describes the performance outcomes, skills and knowledge required to locate, diagnose and rectify faults in telecommunications networks. Telecommunications 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.</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

Application of the unit	<p>Telecommunications officers, communications cablers, installers of customer premises equipment, optical and radio frequency (RF) equipment, multimedia and IP networks apply the skills and knowledge in this unit.</p>
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

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 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 to locate and rectify a fault	1.1. Prepare for given work according to relevant legislation, occupational health and safety (OHS), codes, regulations and standards and identified hazards 1.2. Arrange access to the site according to required procedure 1.3. Obtain information on the nature of fault from the customer 1.4. Obtain suitable testing tools and equipment and specify personal protective equipment 1.5. Conduct fault finding using methodical and safe practices suitable for system and problem type
2. Locate and diagnose the fault	2.1. Conduct appropriate test to identify type of fault 2.2. Isolate the fault progressively to remove likely variables from assessment 2.3. Locate the fault without undue interruptions to the customer activity in the shortest possible time 2.4. Notify the customer of the findings
3. Rectify the fault	3.1. Determine the options to rectify the fault and present them to the customer 3.2. Advise the customer of costs of any repair not covered by service agreement 3.3. Rectify the fault if in agreement with the client 3.4. Conduct the work in a manner which is safe to the repairer and the customer 3.5. Refer any unresolved faults to other parties for resolution or escalation if required
4. Complete documentation and clean up worksite	4.1. Advise the customer of successful fault clearance and secure sign off 4.2. Complete all records 4.3. Complete reports to justify the fault diagnosis and rectification methodology if required 4.4. Remove all waste and debris from worksite and dispose them according to environmental requirements 4.5. Restore any changes made to the worksite during fault repair to the client's satisfaction

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 clients on technical and operational matters and raise OHS issues
- literacy skills to interpret technical documentation and standards and incorporate technical language into written tasks including report on recommendation to rectify fault
- 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
 - 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-finding techniques and test equipment
- safety requirements and standards
- various client's workplace environment and practices
- various types of networks and equipment
- various types of networks and equipment faults and rectification

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"> • identify different faults • establish context and background information and determine and rank likely causes of fault • obtain suitable tools and equipment and apply simple checks, tests and fault-finding methodology • apply recommended means to rectify fault • 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"> • site where fault identification and resolution may be conducted • use of test and related equipment currently used in industry • relevant technical specifications and requirements for telecommunications networks • regulatory and site-related documentation.
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 locating and rectifying faults following OHS requirements • oral or written questioning to assess knowledge of types of faults and implications • evaluation of written reports prepared by the candidate, outlining test result interpretation, fault rectification and recommendations.
Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example:</p> <ul style="list-style-type: none"> • ICTOPN4115A Install and test a dense wavelength division multiplexer system • ICTTEN4051A Install configuration programs on PC

EVIDENCE GUIDE

	<p>based customer equipment</p> <ul style="list-style-type: none"> • ICTTEN4198A Install, configure and test an internet protocol network • 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 legislation, OHS, codes, regulations and standards

- Australian Communications Industry Forum (ACIF) standards and codes
- AS Communications Cabling Manual (CCM)

RANGE STATEMENT

may include:

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
- cabling security codes and regulations
- contract law
- National Association of Testing Authorities (NATA) requirements
- 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
- Trade Practices Act
- OHS including specific OHS and environmental requirements:
 - decommissioning and isolating work site and lines prior to commencement
 - environmental considerations include:
 - clean-up protection
 - stormwater protection
 - waste management
 - noise, dust and clean-up management
 - identifying other services including power and gas
 - safety equipment:
 - 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

RANGE STATEMENT	
	<p>and handling of:</p> <ul style="list-style-type: none"> • asbestos • chemicals • materials • tools and equipment • work platforms • special access requirements • suitable light and ventilation.
Hazards may include:	<ul style="list-style-type: none"> • building debris • earth potential rise (EPR): <ul style="list-style-type: none"> • event at a site, such as an electrical distribution substation may expose telecommunications personnel, users or plant to hazardous voltages • glass fibre • live power lines • manual handling • mud and water • 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) • vermin.
Nature of fault may include:	<ul style="list-style-type: none"> • cable fault • distortion • excessive latency • interference • intermittent • low signal level • network fault • no transmission • poor grade of service • poor signal quality.
Customer may include:	<ul style="list-style-type: none"> • fault centre • individual reporting the fault • network manager

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	<ul style="list-style-type: none"> • network administrator • network operations centre staff • site manager.
<i>Testing tools and equipment</i> may include:	<ul style="list-style-type: none"> • cable locator • cable test set • LAN Cat tester • network management system • optical fault locator • optical time domain reflectometer (OTDR) • protocol analyser • pulse echo test set • sniffer • spectrum analyser.
<i>Personal protective equipment</i> may include:	<ul style="list-style-type: none"> • electrical isolators • gas detectors • personal protective clothing: <ul style="list-style-type: none"> • earmuffs • gloves: <ul style="list-style-type: none"> • leather • plastic • rubber • head protection • kneepads • masks • protective suits • safety boots • safety glasses.
<i>Appropriate test</i> may include:	<ul style="list-style-type: none"> • bit error rate test (BERT) • cable tests • distortion • frequency measurement • insertion loss • packet sniffing • ping • protocol analysis • return loss • route test • signal loss: <ul style="list-style-type: none"> • optical

RANGE STATEMENT	
	<ul style="list-style-type: none"> • RF.
<i>Type of fault</i> may include:	<ul style="list-style-type: none"> • cable fault: <ul style="list-style-type: none"> • attenuation • cracked fibre • crossed wires • crosstalk • damaged coax • faulty splice • incorrect terminations • moisture ingress • open circuit • short circuit • network fault: <ul style="list-style-type: none"> • customer equipment • drop out • latency • loss of addressing • packet loss • poor wireless connection • routing problems.

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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