



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **ICTTEN3104A Maintain an electronic system**

**Release: 1**

## **ICTTEN3104A Maintain an electronic system**

### **Modification History**

Not Applicable

## Unit Descriptor

<p><b>Unit descriptor</b></p>	<p>This unit describes the performance outcomes, skills and knowledge required to perform periodic maintenance and testing of electronic systems and equipment on site and from remote locations, ensuring that electronic systems remain safe and fit for purpose.</p> <p>This unit does not include the major servicing of equipment or repair due to breakdowns.</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><b>Application of the unit</b></p>	<p>Technical staff who maintain an electronic system on site and from remote locations apply the skills and knowledge in this unit.</p> <p>On site routine maintenance involves inspection of critical parts, replacement of disposable items and confirmation that performance is within specification and operating levels are normal.</p> <p>Remote monitoring may be implemented from a Network Management Centre or Help Desk via dedicated communications services or by web-based services. Performance monitoring, investigation of alarms and updating of software, firmware and security systems are all able to be managed remotely.</p> <p>This unit applies to all telecommunications applications including telephony, data, and video and multimedia.</p>
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## Licensing/Regulatory Information

Refer to Unit Descriptor

## Pre-Requisites

<b>Prerequisite units</b>		

## Employability Skills Information

<b>Employability skills</b>	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 maintain system	1.1. <b>Consult with customer</b> or property owner to arrange for site access if required 1.2. Plan a <b>schedule</b> of routine preventive <b>maintenance</b> for the electronic system based on recommended maintenance periods from manufacturer's handbooks and specifications 1.3. Report to <b>appropriate person</b> the impact of proposed maintenance activities on customer's service delivery 1.4. Confirm <b>equipment</b> is accessible and correctly set up for on site preventive maintenance activities and for <b>remote interrogation</b> if required 1.5. Confirm that alarms are functioning according to manufacturer's specifications and enterprise guidelines 1.6. Take corrective action if anomalies or faults are detected, according to enterprise guidelines and manufacturer's specifications
2. Undertake preventive maintenance routines on site and remotely	2.1. Conduct preventive maintenance according to planned schedule 2.2. Report to appropriate person any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule 2.3. Verify equipment is functioning against expected operational parameters to confirm operational status 2.4. Take <b>corrective action</b> if faults are detected, according to enterprise guidelines and manufacturer's specifications 2.5. Escalate to the next level of support when required where preventive maintenance activity falls outside own level of expertise 2.6. Dispose of on site waste materials according to safe working practices and approved procedures
3. Make recommendations and update records	3.1. Record results of routine tests and make recommendations 3.2. Store records according to enterprise guidelines

## 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 internal and external personnel on technical and operational matters
- literacy skills to interpret technical documentation, such as equipment manuals and specifications
- numeracy skills to record and process measurements
- planning and organisational skills to organise and maintain equipment
- problem solving skills to solve equipment and logistics problems
- task management skills to work systematically with required attention to detail and adherence to all safety requirements
- technical skills to:
  - read and interpret results from testing routines
  - use electronic test equipment
  - use remote maintenance software to:
    - monitor and control a remote system
    - perform maintenance tasks
    - upload and download files

#### Required knowledge

- features and operating requirements of electronic equipment
- legislation, codes of practice and other formal agreements that impact on the work activity
- manufacturer's requirements for safe operation of equipment
- specific occupational health and safety (OHS) requirements relating to the activity and site conditions
- testing methods and performance requirements
- troubleshooting and repair procedures
- typical issues and challenges that occur on site and when conducting remote maintenance

## Evidence Guide

<b>EVIDENCE GUIDE</b>	
<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>	
<b>Overview of assessment</b>	
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• identify maintenance required</li> <li>• communicate maintenance details to customers and work associates</li> <li>• undertake preventive maintenance routines on site and remotely</li> <li>• conduct and interpret tests</li> <li>• complete documentation.</li> </ul>
<b>Context of, and specific resources for assessment</b>	<p>Assessment must ensure:</p> <ul style="list-style-type: none"> <li>• suitable site for maintenance of a range of equipment</li> <li>• use of test equipment currently used in industry</li> <li>• relevant regulatory and equipment documentation that impact on work activities.</li> </ul>
<b>Methods of assessment</b>	<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"> <li>• review of an oral and written report prepared by the candidate including test results and recommendations</li> <li>• direct observation of the candidate maintaining an electronic system on site and remotely</li> <li>• oral or written questioning of required knowledge.</li> </ul>
<b>Guidance information for assessment</b>	<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"> <li>• ICTTEN3077A Commission an electronic unit</li> <li>• ICTTEN3089A Repair and replace telecommunications network hardware.</li> </ul> <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</p>

**EVIDENCE GUIDE**

	<p>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.

***Consult with customer*** may include:

- access arrangements
- duration
- location
- nature of works
- time.

***Schedule*** may be:

- hourly
- daily
- weekly
- monthly
- annually
- according to maintenance schedule
- initiated by:



<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>• alarms</li> <li>• elapsed time</li> <li>• error messages.</li> </ul>
<b>Maintenance</b> may include:	<ul style="list-style-type: none"> <li>• adjusting carrier frequency</li> <li>• blowing dust out of power supply</li> <li>• changing air filter</li> <li>• checking low voltage (LV) circuit breaker</li> <li>• infrared scan</li> <li>• measuring transmission line pressurisation</li> <li>• mechanical inspection</li> <li>• monitoring transmitter forward radio frequency (RF) power level</li> <li>• monitoring transmitter reflected RF power level</li> <li>• testing coolant system</li> <li>• testing over-current trip settings</li> <li>• visual inspection.</li> </ul>
<b>Appropriate person</b> may include:	<ul style="list-style-type: none"> <li>• customer</li> <li>• help desk operations manager</li> <li>• network management centre manager</li> <li>• project manager</li> <li>• supervisor.</li> </ul>
<b>Equipment</b> may include:	<ul style="list-style-type: none"> <li>• battery backup</li> <li>• biometrics</li> <li>• broadband cable network</li> <li>• broadcast transmitter</li> <li>• closed circuit TV (CCTV)</li> <li>• multiplexer: <ul style="list-style-type: none"> <li>• synchronous digital hierarchy(SDH)/synchronous optical network (SONET)</li> <li>• statistical</li> </ul> </li> <li>• radio frequency identification (RFID)</li> <li>• solar panel power supply</li> <li>• supervisory control and data acquisition (SCADA)</li> <li>• transmission system</li> <li>• voice over internet protocol (VoIP).</li> </ul>
<b>Remote interrogation</b> may include:	<ul style="list-style-type: none"> <li>• dedicated virtual private network (VPN)</li> <li>• local area network (LAN)</li> <li>• SCADA system:</li> </ul>

<b>RANGE STATEMENT</b>	
	<ul style="list-style-type: none"> <li>• cellular telemetry</li> <li>• integrated dispatch enhanced network (IDEN) SCADA</li> <li>• web-based SCADA</li> <li>• wireless SCADA</li> <li>• transaction language 1 (TL1) interface</li> <li>• wide area network (WAN)</li> <li>• web server and simple network management protocol (SNMP) agent.</li> </ul>
<i>Corrective action</i> may include:	<ul style="list-style-type: none"> <li>• checking warranties and service agreements to establish if repair or alteration is covered</li> <li>• electronic adjustment</li> <li>• organising warranty replacement from manufacturer</li> <li>• physical adjustment</li> <li>• repair or replacement of parts or equipment.</li> </ul>

### Unit Sector(s)

<b>Unit sector</b>	Telecommunications
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### Co-requisite units

<b>Co-requisite units</b>		

## Competency field

<b>Competency field</b>	Telecommunications networks engineering
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