



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN6045A Implement planned network changes with minimal impact to the customer

Release: 1

ICTTEN6045A Implement planned network changes with minimal impact to the customer

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to effectively upgrade network equipment, increase network capacity, install new network elements and change existing network elements with minimal impact to the customer. It involves the control of planned routine maintenance activities on the network. 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 service providers, asset owners and contractors who upgrade or reconfigure new and existing equipment apply the skills and knowledge in this unit. This unit applies to specialist staff with high level technical skills and appropriate authority to coordinate the activities of maintenance personnel. It addresses compliance issues associated with service level agreements.
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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 network changes plan	1.1. Obtain relevant legislation, codes, regulations and standards for compliance when conducting work 1.2. Evaluate work order with relevant personnel and identify the likely effects on the network and impact on customers of the planned changes 1.3. Develop network engineering strategies including management of outages with involvement of the network operations centre (NOC) 1.4. Prepare and produce a network changes plan for approval according to enterprise practice
2. Implement and test network changes prior to customer utilisation	2.1. Implement network changes according to network engineering strategies following occupational health and safety (OHS) and environmental requirements with minimal impact to customer traffic 2.2. Conduct integration testing of newly installed equipment to ensure interoperability with existing equipment and network 2.3. Conduct performance test to assess the network changes as stated in manufacturer's specifications and enterprise acceptance testing procedures 2.4. Analyse test results and rectify problems or escalate according to enterprise procedures 2.5. Initiate quality assurance procedures to ensure confidence in quality of processes according to enterprise policy 2.6. Prepare reports for the appropriate area within the enterprise
3. Enable functionality of network changes to customer	3.1. Monitor network stability prior to connecting customer traffic and take action to rectify any problems 3.2. Enable full functionality of network changes to customer according to the network changes plan and monitor network to ensure continued stability 3.3. Prepare appropriate documentation according to enterprise requirements
4. Assess and report on implementation of network changes	4.1. Use monitoring data to evaluate the performance of the network changes and impact to customers according to network engineering strategies and customer requirements 4.2. Document the implementation of the planned network changes and recommend any further improvements as part of the enterprise's quality assurance system

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- analytical skills to assess network changes and make recommendations
- communication skills to interact with enterprise personnel, customers and other contractors keeping a customer focus and consideration of customer needs
- literacy skills to read, interpret and use equipment and system manuals and specifications and relevant enterprise policy and documentation
- planning and organisational skills to coordinate all work groups associated with network change
- PC skills to load software and hardware
- problem solving skills to account for unexpected faults or equipment incompatibilities
- research skills to gain and maintain relevant and current technical product knowledge
- safety awareness skills to adhere to all related OHS requirements and work practices
- technical skills to:
 - conduct performance testing
 - correctly handle, connect and calibrate test equipment
 - interpret test results, diagnose and rectify faults
 - perform integration testing

Required knowledge

- compatibility and interoperability of system types
- factors affecting network stability
- hardware
- internet protocol (IP) based networks
- legislation and licensing relevant to work activity
- optical networks
- quality assurance procedures
- software
- test equipment types suitable for tests to be made
- types of customer networks

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: • evaluate planned network changes, including impact on customer • develop network engineering strategies to manage outages • implement network changes • conduct integration testing, analyse results and rectify faults • enable full functionality of network changes.
Context of and specific resources for assessment	Assessment must ensure: • sites where network changes may be conducted • use of testing equipment currently used in industry • systems manuals, specifications and enterprise policy.
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 implementing network changes • review of network changes plan prepared by the candidate outlining network engineering strategies to manage outages • review of test results and 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: • ICTTEN6044A Coordinate fault rectification and restoration of service following network outages. Aboriginal people and other people from a non-English

EVIDENCE GUIDE

	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 relate to:

- Australian Communications Industry Forum (ACIF) standards and codes
- 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

RANGE STATEMENT	
	• 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 • technical standards AS/ACIF S008:2006 and AS/ACIF S009:2006 • Trade Practices Act.

RANGE STATEMENT	
Work order may include:	• authority to proceed with change to the network • list of activities to be undertaken • schedule of activities.
Relevant personnel may include:	• carrier or service provider staff • electrical contractor • equipment manufacturer • equipment supplier • external customer • on site operation staff.
Likely effects may include:	• congestion • drop out • excessive latency • limited coverage • loss of coverage • loss of service • poor grade of service (GoS) • poor signal quality • routing problems.
Network may include:	• cellular mobile networks • data and voice • IP network • national wide area networks (WAN) • optical dense wavelength division multiplexing (DWDM) networks • public switched telephone network (PSTN).
Impact may include:	• disruption of service to residential customers • intermittent performance • loss of service and revenue to an enterprise.
Customers may include:	• building owner • communications consultant • contractor to a major supplier • end users • equipment owner • householder • operations staff.
Network engineering strategies may include:	• provision of redundant path • rerouting of traffic • supply of temporary equipment to maintain

RANGE STATEMENT	
	minimal services.

RANGE STATEMENT	
Outages may include:	• loss of service to customers due to a network disruption • planned outage in the case of network upgrade • unplanned outage in relation to fault.
Network Operations Centre may include:	• engineering unit within a carrier responsible for: • controlling the network • coordinating repairs or changes to the network • monitoring the network • performing diagnostic tests.
Enterprise practice may include:	• procedures for implementing installation • procedures for implementing maintenance • reporting tasks.
OHS and environmental requirements may relate to:	• decommissioning and isolating worksite and lines prior to commencement • gas and other hazard detection equipment • 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.

RANGE STATEMENT	
<i>Customer traffic</i> may include:	• analog or digital forms of: • data • image • voice.
<i>Integration testing</i> may include:	• compatibility • interface units • interoperability.
<i>Performance test</i> may include:	• bandwidth • blocking • call rate • congestion • distortion • drop out rate • functionality • interference • latency • network tests • optical transmission tests • packet loss rate • quality of service (QoS) • radio transmission test • recovery rate • redundancy • signal to noise ratio • switching tests • transmission tests • transmission tests • transmitted power measurements • upload and download rate.
<i>Manufacturer's specifications</i> may include:	• electrical • environmental parameters • mechanical • regulatory.
<i>Acceptance testing</i> may include:	• testing equipment following major upgrade • testing newly installed equipment.
<i>Escalate</i> may include:	• greater involvement from the NOC specialist personnel • requesting vendor specialist technical support.

RANGE STATEMENT	
Quality assurance may include:	• acting on logs, reports and other data to guide ongoing quality improvements • reporting on installation or maintenance activities • updating logs.
Network stability may include:	• alarm monitoring • congestion activity report • fault incidence report • network management report • traffic flow measurements.

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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