



Australian Government

ICTBWN309 Perform tests on optical communication system and components

Release: 1

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Modification History

Release	Comments
Release 1	This version released with ICT Information and Communications Technology Training Package Version 5.0.

Application

This unit describes the skills and knowledge required to test optical communication systems and components in the field using portable test instruments.

It applies to installation contractors, technical staff and field officers from telecommunications service providers or other private and public organisations or regulatory authorities.

These workers combine technical skills with organisational and administrative skills when working on broadband passive optical networks (PON), fibre to the x (FTTx) networks, hybrid fibre coaxial (HFC) networks and dense wavelength division multiplexing (DWDM) systems during installation, maintenance, commissioning and troubleshooting phases.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications – Broadband and Wireless Networks

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to use optical measuring instruments	1.1 Notify client about site access, security arrangements and location details for optical system and test purpose 1.2 Identify site hazards and notify appropriate personnel to make site safe according to enterprise requirements 1.3 Devise and implement risk control and safety measures when using high power laser test instruments and optical time-domain reflectometer

	(OTDR) associated with launch fibres, patch cords or enclosure adaptors 1.4 Prepare testing plan in consultation with client, indicating type of measurement at nominated wavelength, based on equipment specifications 1.5 Select appropriate tools and test instruments according to required measurement and enterprise practice
2. Conduct optical measurements	2.1 Set up test instrument according to manufacturer instructions, work health and safety (WHS) and environmental requirements 2.2 Test patch cords and/or launch/receive fibres are functional 2.3 Inspect and clean optical connectors 2.4 Use appropriate testing techniques to assess performance of optical system or component 2.5 Record test results and compare with standard test specifications according to manufacturer and enterprise guidelines 2.6 Evaluate test results and report on functionality of optical component or equipment, and performance of optical system
3. Complete optical measurement process	3.1 Make recommendations, based on test result interpretations, about optimising component and system performance 3.2 Clean work site and make safe according to enterprise requirements and customer satisfaction 3.3 Notify appropriate personnel of job completion for sign off and present test documentation, according to enterprise requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance, but not explicit in the performance criteria.

Skill	Description
Reading	Interprets information from relevant sources to plan and identify all job requirements
Writing	Accurately completes relevant reports and documentation using clear and technically specific language
Oral Communication	- Uses listening and questioning skills to confirm understanding of requirements, and participates in a verbal exchange of ideas and solutions - Uses appropriate, detailed and clear language to address key personnel and clients

Numeracy	Performs mathematical calculations to check, interpret and confirm results of system tests
Navigate the world of work	- Complies with explicit policies and procedures, and explores and implements, where identified, the implicit expectations of policies and procedures - Understands roles and responsibilities for task and makes basic decisions about work completion parameters
Interact with others	- Uses a limited range of accepted practices for communicating in a work environment - Recognises common cultural and other differences of people in the work context and accommodates these differences appropriately
Get the work done	- Takes responsibility for planning, sequencing and prioritising tasks and own workload for efficiency and effective outcomes - Makes low-impact decisions within familiar situations, based on a range of predefined or routine solutions and evaluates the effectiveness of the outcome

Range of Conditions

Specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. It is restricted to essential operating conditions and any other variables essential to the work environment.

Instruments/devices to be used must include:	- laser light source including visual laser light source - laser power meter - passive optical network (PON) meter - optical time domain reflectometer (OTDR)
Optical measurements to be taken and recorded must include:	- optical power levels - insertion loss of a passive device - end-to-end fibre loss (bi-directional) - splice loss - distance to fault, event, end of fibre using an (OTDR)

Unit Mapping Information

No equivalent unit. Supersedes and is not equivalent to ICTBWN301 Perform tests on optical communication system and components.

Links

Companion Volume Implementation Guides are available from VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTBWN309 Perform tests on optical communication system and components

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Performance Evidence

The candidate must demonstrate, on two occasions, the ability to perform the tasks outlined in the elements, performance criteria, and foundation skills, and to:

- carry out work according to job specifications and work health and safety (WHS) regulations
- determine and plan optical tests and measurements
- use the following optical measuring instruments and devices:
 - laser light source including visual laser light source
 - laser power meter
 - passive optical network (PON) meter
 - optical time domain reflectometer (OTDR)
- perform and record optical measurements for:
 - optical power levels
 - insertion loss of a passive device
 - end-to-end fibre loss (bi-directional)
 - splice loss
 - distance to fault, event, end of fibre using an (OTDR)
- assess and make recommendations from the test results
- document and present test outcomes.

Knowledge Evidence

The candidate must be able to demonstrate the knowledge required for the elements, performance criteria, and foundation skills, which includes knowledge about:

- legislation, regulations, codes and standards that impact on work activities
- consequences of mating contaminated optical connectors
- downstream and upstream signals
- dense wavelength division multiplexing (DWDM) metro and long-haul system architecture

- hybrid fibre coaxial (HFC) architecture (optical section)
- logarithmic power levels (decibels and dBm)
- optical connector types
- optical fibre and laser safety, practices, handling and application
- optical spectrum limits and wavelengths used in various applications and the International Telecommunications Union (ITU) grid
- role of optical transmitters and receivers
- passive optical network (PON) architecture
- transmission system line rates:
 - optical ethernet
 - synchronous digital hierarchy (SDH)
- wavelength division multiplexing (WDM), coarse wavelength division multiplexing (CWDM) and DWDM principles, and optical multiplexers.

Assessment Conditions

Skills must be assessed in a workplace or simulated environment where conditions are typical of those in a telecommunications work environment or workplace.

Access is required to:

- site/s where installation of supporting infrastructure can be conducted
- plant, tools and equipment currently used in industry
- relevant regulatory and equipment documentation that impacts on work activities.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

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