



Australian Government

Assessment Requirements for ICTOPN404 Test optical communications systems 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.

Performance Evidence

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

- obtain operation documentation for advanced optical test instruments
- plan and prepare a schedule of tests to be performed
- conduct at least one optical test
- record the following measurements for a range of parameters:
 - optical power level
 - insertion loss of optical network
 - end-to-end fibre loss (bi-directional)
- test, calculate and document optical link budget according to industry standards using the following test equipment:
 - optical time domain reflectometer (OTDR)
 - optical spectrum analyser (OSA) or equivalent optical spectrum analyser
 - optical return loss (ORL)
- comply with all related work health and safety (WHS) requirements and work practices
- evaluate optical performance using:
 - wavelength spectrum parameters
 - ODTR events.

Knowledge Evidence

The candidate must demonstrate the knowledge required to perform the tasks outlined in the elements, performance criteria, and foundation skills, which includes knowledge about:

- optical system and its main components
- hazards and risks associated with optical systems
- health and safety and environmental requirements associated with optical systems
- common tests, measurements and testing plans used for optical systems

- common wavelengths involved with optical systems
- use of tools and test equipment for optical systems
- consequences of mating contaminated optical connectors
- calculations using decibels, dBm
- downstream and upstream signals
- dense wavelength division multiplexing (DWDM) metro and long-haul system architecture
- measurement of:
 - DWDM signals
 - gain and gain flatness of optical amplifier
 - laser spectral stability, drift and unexpected variation in spectral transmission characteristics
- non-linear effects, four-wave mixing
- optical connector types
- optical signal to noise ratio (OSNR)
- optical spectrum limits, wavelengths used in various applications and International Telecommunication Union (ITU) grid
- optical transmitters and receivers
- optical return loss (ORL)
- OTDR dead zones, dynamic range and launch cable reflectance
- safe handling procedures with optical fibres
- transmission system line rates including:
 - optical ethernet
 - optical transport network (OTN)
 - synchronous digital hierarchy (SDH)
- wavelength division multiplexing (WDM), coarse wavelength division multiplexing (CWDM) and DWDM principles and optical multiplexers
- influence of legislation, regulations, codes and standards relevant to advanced optical work.

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:

- tools and equipment required for measurements
- manufacturer documentation for test instruments and equipment under test.

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

Links

Companion Volume Implementation Guides are available from VETNet -

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