



Australian Government

ICTOPN512 Analyse and integrate specialised optical devices

Release: 1

ICTOPN512 Analyse and integrate specialised optical devices

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 7.0.

Application

This unit describes the skills and knowledge required to analyse and integrate specialised optical devices into existing optical networks to support higher bandwidths associated with Next Generation Networks (NGN).

It applies to individuals who work for network carriers, service providers or other private and public organisations, who have experience in optical transmission. They combine technical expertise with a range of analytical, research and planning skills to develop integrated solutions for particular business needs.

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

Unit Sector

Telecommunications – Optical Networks

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Plan for specialised optical devices for network integration	1.1 Obtain and review required legislation, codes, company work practices, regulations and standards, work health and safety (WHS) and environmental requirements, personal protective equipment, and hazard identification tools for scoped work 1.2 Obtain plans and drawings of existing optical networks from relevant personnel and review locations for suitability of integrating specialised optical devices 1.3 Analyse and evaluate integration options that satisfy customer network requirements and device specifications 1.4 Prepare and submit the business case for adopting recommended

	integration solutions 1.5 Prepare design plan with interconnection details to existing system and installation options and seek approval to proceed from customer 1.6 Conduct an impact risk assessment of the hardware integration with the network operations centre (NOC) 1.7 Create a contingency plan and address risks identified in impact risk assessment
2. Integrate specialised optical devices into the network	2.1 Install specialised optical devices into existing network according to design plan 2.2 Test the network, evaluate results and verify optical network performance with integrated specialised optical devices in operation
3. Document evaluation of integrating specialised optical devices into dense wavelength division multiplexing (DWDM) networks	3.1 Produce an updated design plan and submit to customer with archived copies filed according to organisational policies 3.2 Prepare an evaluation report on network performance with specialised optical devices and recommendations for enhancements 3.3 Notify NOC of job completion and obtain sign-off from relevant personnel

Foundation Skills

SKILL	DESCRIPTION
Numeracy	Uses mathematical formulae to evaluate technical data and interpret results
Oral communication	- Uses listening and questioning skills to confirm technical requirements - Participates in verbal exchanges of ideas and solutions and uses required, detailed and clear language to address key personnel and clients
Reading	Interprets textual information from required sources to identify and plan for all job requirements and adhere to procedures and standards
Writing	Completes standard reports and documentation using clear and technically specific language and numerical data
Teamwork	Identifies requirements of important communication exchanges, selecting required channels, format, tone and content to suit purpose and audience and monitoring impact
Planning and organising	Works independently within workplace parameters with a strong sense of responsibility and ownership of goals, plans, decisions and outcomes

SKILL	DESCRIPTION
	Monitors adherence to legal and regulatory rights and responsibilities with specific reference to safe industry practices
Problem solving	- Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others taking into account capabilities, efficiencies and effectiveness - Takes responsibility for high-impact decisions in complex situations involving many variables and constraints
Technology	Identifies systems, devices and applications with potential to meet current and/or future needs

Unit Mapping Information

Supersedes and is equivalent to ICTOPN506 Analyse and integrate specialised optical devices in the network.

Links

Companion Volume Implementation Guide is found on VETNet -

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

Assessment Requirements for ICTOPN512 Analyse and integrate specialised optical devices

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- integrate at least two specialised optical devices in a network.

In the course of the above, the candidate must:

- evaluate and document integration to the network and recommend enhancements
- submit required documentation to personnel
- analyse specialised optical devices
- comply with all related work health and safety (WHS) requirements and work practices.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- locations suitable for integrating specialised optical devices
- types of network integration options available for specialised optical devices
- characteristics and requirements of:
 - evaluation reports
 - business cases
 - design plans
 - impact risk assessments
 - contingency plans
- attenuation characteristics of optical fibres
- principles of operation of dense wavelength division multiplexing (DWDM)
- features and operating requirements of the following test equipment:
 - a hand-held optical power meter
 - an optical spectrum analyser

- a transmission test set
- dispersion characteristics of optical fibres
- role of dispersion compensation devices
- standard electrostatic discharge precautions
- functions of an optical add-drop multiplexer (OADM) and reconfigurable optical add-drop multiplexer (ROADM)
- functions and features of gain equalisation techniques
- International Telecommunications Union (ITU) wavelength grid for DWDM
- measurement of dispersion in optical systems
- optical amplifier operation
- optical fibre connector types and characteristics
- optical fibre types and characteristics
- optical return loss (ORL)
- path protection and protection switching
- protocols used on optical DWDM systems
- role of reflectance in optical systems
- ring topologies and linear network topologies
- tunable laser sources and their characteristics
- WHS requirements that impact the safe inspection of optical connectors and the safe measurement of optical power from laser transmission systems
- required legislation, codes, company work practices, regulations and standards and environmental requirements for scoped work.

Assessment Conditions

Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.

This includes access to:

- test equipment used in industry
- manufacturer technical documentation, legislation, codes and standards.

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

Links

Companion Volume Implementation Guide is found on VETNet -

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