



Australian Government

ICTOPN506 Analyse and integrate specialised optical devices in the network

Release: 1

ICTOPN506 Analyse and integrate specialised optical devices in the network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

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 telecommunications 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 integration 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. Analyse specialised optical device and prepare for integration in the network	1.1 Obtain relevant legislation, codes, regulations and standards and follow work health and safety (WHS) and environmental requirements for the project work 1.2 Work safely according to relevant safety legislation and company work practices, identifying hazards and using personal protective equipment 1.3 Obtain plans and drawings of existing optical network from appropriate person and review potential locations for suitability of

	integrating additional hardware 1.4 Analyse and evaluate a range of integration options using device specifications which satisfy the customer's network requirements 1.5 Prepare and submit the business case for adopting recommended integration solution 1.6 Prepare design plan with interconnection details to existing system and installation options and seek approval to proceed from customer 1.7 Undertake an impact risk assessment of the hardware integration with the network operations centre (NOC) and prepare for contingencies using contingency plan
2. Integrate specialised optical device in the network	2.1 Install and integrate specialised optical devices into existing network according to design plan 2.2 Test the network and evaluate results to verify optical network performance with integrated specialised optical devices in operation
3. Document integration of the specialised optical device in dense wavelength division multiplexing (DWDM) network	3.1 Produce an updated design plan and submit to customer with copies filed for later reference according to organisation's policies 3.2 Prepare an evaluation report on network performance with specialised optical devices with recommendations for future enhancements 3.3 Notify NOC of job completion and obtain sign-off from appropriate person

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2, 1.4, 1.7, 2.1, 3.1	Interprets textual information from relevant sources to identify and plan for all job requirements and adhere to procedures and standards
Writing	1.5, 1.6, 3.1, 3.2, 3.3	Accurately completes standard reports and documentation using clear and technically specific language and numerical data
Oral Communication	1.5, 1.6, 3.3	Uses listening and questioning skills to confirm understanding for technical

		requirements Participates in a verbal exchange of ideas and solutions and uses appropriate, detailed and clear language to address key personnel and clients
Numeracy	2.2	Uses mathematical formulae to evaluate technical data and interpret results
Navigate the world of work	1.1, 1.2, 3.1	- Works independently within workplace parameters with a strong sense of responsibility and ownership of goals, plans, decisions and outcomes - Monitors adherence to legal and regulatory rights and responsibilities with specific reference to safe industry practices
Interact with others	3.3	Actively identifies requirements of important communication exchanges, selecting appropriate channels, format, tone and content to suit purpose and audience and monitoring impact
Get the work done	1.1, 1.3-1.7, 2.1, 2.2	- 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 - Actively identifies systems, devices and applications with potential to meet current and/or future needs - When dealing with complex issues, may use intuition to identify the general problem area, switching to analytical processes to clarify goals and key issues and using lateral thinking processes to generate possible solutions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTOPN506 Analyse	ICTOPN5123A	Updated to meet	Equivalent Unit

Code and title current version	Code and title previous version	Comments	Equivalence status
and integrate specialised optical devices in the network	Analyse and integrate specialised optical devices in the network	standards for Training Packages	

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for ICTOPN506 Analyse and integrate specialised optical devices in the network

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Performance Evidence

Evidence of ability to:

- analyse a specialised optical device and prepare a design to integrate it with a network
- integrate and test the device
- document integration to the network and recommend enhancements
- submit relevant documentation to appropriate personnel
- comply with all related work health and safety (WHS) requirements and work practices.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- explain attenuation characteristics of optical fibres
- summarise principles of operation of dense wavelength division multiplexing (DWDM)
- describe features and operating requirements of test equipment, including:
 - a hand-held optical power meter
 - an optical spectrum analyser
 - a transmission test set
- discuss dispersion characteristics of optical fibres
- explain the role of dispersion compensation devices
- explain standard electrostatic discharge precautions
- explain functions of an optical add-drop multiplexer (OADM) and reconfigurable optical add-drop multiplexer (ROADM)
- explain gain equalisation
- summarise the International Telecommunications Union (ITU) wavelength grid for DWDM

- explain the measurement of dispersion in optical systems
- summarise optical amplifier operation
- identify optical fibre connector types and characteristics
- identify optical fibre types and characteristics
- outline optical return loss (ORL)
- explain path protection and protection switching
- clarify protocols used on optical DWDM systems
- explain the role of reflectance in optical systems
- explain ring topologies and linear network topologies
- explain specific WHS requirements that impact the safe inspection of optical connectors and the safe measurement of optical power from laser transmission systems
- describe tunable laser sources and their characteristics.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the Telecommunications – Optical Networks field of work and include access to:

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

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

Links

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