



Australian Government

ICTOPN510 Test and commission dense wavelength division multiplexing transmission systems

Release: 1

ICTOPN510 Test and commission dense wavelength division multiplexing transmission systems

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 test and commission optical transmission systems using dense wavelength division multiplexing (DWDM) technology.

It applies to individuals who work with networking carriers, service providers, public utilities and broadcasting companies. They combine technical optical communications skills with broader organisational and administrative skills in a range of commercial contexts and environments.

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. Prepare to commission DWDM transmission system	1.1 Implement hazard risk control measures according to organisational standards and requirements 1.2 Review system specifications and technical data and identify system operating parameters 1.3 Obtain and check required equipment for faults and compliance with organisational regulations 1.4 Verify that all required equipment is installed, and that circuit cards and filler cards are correctly located and seated 1.5 Check that interconnecting fibres to optical multiplexers and shelves are intact and routed

ELEMENT	PERFORMANCE CRITERIA
	1.6 Establish communication between computer and DWDM shelf 1.7 Upload latest software release to each DWDM shelf in the network
2. Commission DWDM transmission system	2.1 Connect an optical test set and a physical optical loopback to the system, and select protocol compatible with DWDM hardware 2.2 Check connection status and that test set data is passing 2.3 Monitor quality of received signal, set performance monitoring (PM) features and retrieve PM counts 2.4 Conduct a long-term stability test and verify that no errors are noted while customer input signal is set to the worst case (minimum) power level 2.5 Verify that no alarms are generated during long term stability test periods 2.6 Dispose of antistatic packaging to minimise environmental impact
3. Complete test and commissioning documentation	3.1 Finalise documentation on commissioning test results according to organisational procedures 3.2 Present results to required person according to organisational procedures

Foundation Skills

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

SKILL	DESCRIPTION
Numeracy	Uses mathematical equations to evaluate technical data and interpret results
Oral communication	- Uses listening and questioning skills to confirm 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 required reports and documentation using clear and technically specific language and numerical data
Planning and organising	Accepts responsibility for planning and sequencing complex tasks and workload, negotiating key aspects with others taking into account capabilities, efficiencies and effectiveness

SKILL	DESCRIPTION
	Monitors progress of plans and schedules and reviews and changes them to meet new demands and priorities
Self-management	Takes responsibility for following policies, procedures and legislative requirements, and identifies organisational implications of new legislation or regulation

Unit Mapping Information

Supersedes and is equivalent to ICTOPN504 Test and commission a dense wavelength division multiplexing transmission system.

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 ICTOPN510 Test and commission dense wavelength division multiplexing transmission systems

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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:

- test and commission at least two dense wavelength division multiplexing (DWDM) transmission systems.

In the course of the above, the candidate must:

- plan and coordinate commission
- test and DWDM transmission system according to required regulations and procedures
- complete commissioning documentation according to organisational requirements.

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:

- legislation, codes, regulations and standards, work health and safety (WHS), and organisational requirements for scoped work, including:
 - reporting requirements
 - commissioning test procedures
- organisational hazard risk control measures
- procedures to review equipment for faults and compliance with organisational regulations
- causes of alarms in long term stability tests
- principles of operating DWDM transmission systems
- standard electrostatic discharge precautions
- features and operating requirements of the following test equipment:
 - a hand-held optical power meter
 - a transmission test set
 - an optical spectrum analyser

- functions of an optical add drop multiplexer
- how to set up the following:
 - internet protocol (IP) addressing
 - subnet mask
 - dynamic host configuration protocol (DHCP)
 - default gateway
- International Telecommunications Union (ITU) wavelength grid for DWDM
- identify types and characteristics of optical fibre connector
- path protection and protection switching
- physical optical loopbacks and software loopbacks
- protocols used on optical DWDM systems
- ring topologies and linear network topologies
- specific health and safety requirements that impact the safe inspection of optical connectors and the safe measurement of optical power from laser transmission systems.

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.

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

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