



Australian Government

Assessment Requirements for ICTRFN406 Maintain hybrid fibre coaxial broadband cable network

Release: 2

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Modification History

Release	Comments
Release 2	This version released with ICT Information and Communications Technology Training Package Version 5.0.
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

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:

- determine the performance of and maintenance requirements for the hybrid fibre coaxial (HFC) broadband cable
- prepare a maintenance schedule and planned activities, and arrange resources
- carry out maintenance activities following appropriate procedures and techniques, using approved equipment where specified
- perform radio frequency (RF) and optical measurements and analyse results
- administer corrective measures where required, and verify and document actions
- comply with site risk control, work health and safety (WHS), environmental, quality and communication requirements.

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

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:

- the following terms: 16 QAM, 64 QAM, 256 QAM
- relevance of alternating current (AC) and direct current (DC) electrical equipment in HFC broadband cable network
- forward error correction (FEC) and Reed-Solomon Code
- bit error ratio (BER) and acceptable values

- constellation diagrams
- digital modulation techniques
- Data Over Cable Service Interface Specification (DOCSIS) cable modem characteristics
- future broadband cable network (BCN) and migration to all-optical cable networks
- HFC broadband cable network principles, architecture and associated equipment
- minimum standards allowable in the return path for ingress
- optical fibre characteristics
- quadrature phase shift keying (QPSK)
- services carried on the HFC broadband cable network
- spectrum utilisation of the return path showing location of telephony and data channels, and signalling and test frequencies
- video stream transport formats including:
 - digital video broadcasting (DVB) - asynchronous serial interface (ASI)
 - high definition serial digital interface (HD-SDI)
 - motion picture experts group 2 (MPEG-2)
 - standard definition serial digital interface (SD-SDI)
 - modulation error ratio (MER) and acceptable values
- types of amplifier and placement in a HFC broadband cable network
- bi-directional RF amplifier and unidirectional RF amplifier
- eye diagram interpretation
- frequency spectrum and RF frequency plan HFC broadband cable network
- use of passive devices including filter, attenuator, power inserter, coaxial splitter, coupler, multitap and equaliser
- calculation of overall gain or loss when given signal levels in dBmV
- coaxial transmission line characteristics including cable tilt or slope
- forward path from head end to subscriber showing expected signal levels at key points
- power supply requirements in a HFC broadband cable network
- return path from subscriber to head end showing expected signal levels at key points
- RF amplifier characteristics including gain and tilt adjustment, equalisation and overload
- forms of ingress and where they may fall in the return path
- set up, operation and interpretation of test equipment for complex tests including:
 - optical time domain reflectometer (OTDR)
 - optical power meter
 - digital signal level meter
 - RF sweep equipment
 - spectrum analyser
- hand and power tools required to assemble and disassemble equipment in pits and in elevated work situations.

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:

- sites on which HFC maintenance may be conducted
- maintenance tools and test instruments currently used in industry
- relevant regulatory, enterprise and equipment documentation that impact on maintenance activities.

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>