



Australian Government

Department of Education, Employment and Workplace Relations

CUFBRT401A Install or upgrade broadcast equipment and facilities

Revision Number: 1

CUFBRT401A Install or upgrade broadcast equipment and facilities

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to install or upgrade broadcasting equipment and facilities. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.
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Application of the Unit

Application of the unit	Broadcast technicians or technologists apply the skills and knowledge described in this unit. Although they work under the direction of a senior technologist or broadcast engineer, they are expected to work with minimum supervision and may, on occasions, be responsible for supervising others. This unit covers the installation or upgrading of equipment in television and/or radio studios. The scope of work varies from installing or upgrading a single piece of equipment to installation of a whole studio or facility. Skills associated with the maintenance of equipment and facilities are covered in: • CUFBRT402A Maintain broadcasting facilities and equipment • CUFBRT403A Ensure quality of broadcast output.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
Prepare for installation	1. In consultation with relevant personnel, confirm installation requirements with reference to system drawings and specifications 2. Seek out additional information where there are gaps or deficiencies in specifications 3. Report problems with specifications in accordance with enterprise procedures 4. Identify the requirements and impact of existing equipment and new equipment to be installed 5. Power up and run performance tests to systems prior to installation 6. Test cabling and ensure it is working to required specifications and for required capacity 7. Test transmission for signal quality 8. Check tools and equipment to ensure they are in safe working order and adjusted to manufacturer specifications
Install or upgrade equipment	9. Install equipment in accordance with specifications and timelines, and in a manner that is safe for the installer and the user. 10. Place, secure and terminate a range of cables, as required, ensuring cable support is sufficient 11. Organise and monitor cabling and equipment to ensure compliance with regulatory and industry standards 12. Ensure that interruption to existing service is only to the extent agreed with the customer/client 13. Connect equipment into the broadcast system using the appropriate type of connection and connectors 14. Accurately test the system performance and ensure valid results 15. Check that equipment is operational and make adjustments to equipment 16. Report instances of equipment non-compliance or malfunction in accordance with enterprise procedures 17. Check and update technical drawings and other documentation requiring change 18. Identify certification requirements to ensure tests and recording of results are relevant
Program system features	19. Install the program in accordance with system specifications

ELEMENT	PERFORMANCE CRITERIA
	20. Ensure system functionality matches customer/client requirements 21. Save program data and record for later use 22. Leave job specifications on site in a secure but accessible location
Clean up worksite	23. Clean and adjust tools and equipment and store in a secure but accessible location 24. Remove installation waste and debris from worksite and dispose of in accordance with environmental requirements 25. Recover obsolete equipment and return to appropriate point for refurbishment or disposal 26. Complete work in a safe manner 27. Restore changes made to work area during installation to the customer's satisfaction 28. Return system drawings and specifications to the approved location on completion of work

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- communication and literacy skills sufficient to:
 - interpret information from system drawings and specifications, e.g. cable schedules; assembly and dismantling sequences; interfaces and connections to other systems; circuit characteristics; dimensions, scales and tolerances
 - liaise effectively with customers/clients on the job
 - complete workplace documentation
 - update drawings and specifications
- ability to diagnose routine equipment faults
- ability to work and communicate effectively as a team member, including seeking advice and assistance with non-routine equipment malfunctions
- technical skills sufficient to:
 - use hand and power tools in a safe manner to install broadcasting equipment and facilities
 - use a range of installation methods, e.g. fastening, free standing, rack mounting, sliding, hanging or suspending
 - move equipment in a safe manner using a range of techniques, e.g. pulleys and hoists, manual lifting
 - terminate cables
 - solder components
 - carry out measurements and adjustments, such as amplitude and frequency response, distortion, noise performance, phase, timing, bit error rate, data network performance and mechanical performance
- self-management skills sufficient to work under pressure and to meet deadlines
- numeracy skills sufficient to interpret and record test measurement data

Required knowledge

- features of test measurement equipment, including:
 - waveform monitor
 - peak program meter (PPM)
 - reference signals, e.g. video or audio line-up signals
 - performance limitations of signal paths, e.g. cliff effect
 - variations of test methods, e.g. waveform display errors, meter errors
 - effect of the measurement equipment itself on the measured system
- television standards, e.g. PAL, NTSC, SECAM, digital
- industry knowledge, including:

REQUIRED SKILLS AND KNOWLEDGE

- structure of the broadcasting industry
- roles and responsibilities of personnel in the broadcasting industry
- impact of technological changes on maintenance procedures
- correct terminology, e.g. symbols, terminology and conventions used for electrical, mechanical and electronic drawings and specifications
- regulatory and industry standards as listed in the range statement
- product knowledge, e.g. manufacturer standards and specifications
- features and operational standards for enterprise-specific equipment and facilities
- sources of advice, information, and technical support
- issues and challenges that arise in the context of maintaining broadcasting facilities and equipment
- precautions to be taken when handling static-sensitive or fragile equipment
- well-developed understanding of the types of, and interrelationship between, drawings used in specifications, e.g. isometric, orthographic, first- and third-angle, assembly drawings, circuit and wiring diagrams, block and schematic diagrams
- basic understanding of network operations and transmission facilities, sufficient to ensure that installed equipment is correctly aligned
- performance limitations of machine control
- OHS requirements as they relate to maintenance operations, e.g. protective clothing and personal safety systems; safe isolation of equipment, such as mechanical, electricity, gas, air or fluids; weight loading; and manual handling

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the following is essential:

- correct interpretation of installation specifications
- ability to work as a team member with minimum supervision
- correct installation and connection of a range of equipment into either a television **or** a radio broadcast system
- ability to complete scheduled work on time.

Context of and specific resources for assessment

Assessment must ensure:

- access to a range of equipment used in broadcasting facilities
- access to regulatory and industry standards
- access to appropriate learning and assessment support when required
- use of culturally appropriate processes and techniques appropriate to the language and literacy capacity of learners and the work being performed.

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance
- observation of the candidate installing or upgrading broadcasting facilities or equipment
- written or verbal questioning to test knowledge as listed in the required skills and knowledge section of this unit.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- CUFBRT402A Maintain broadcasting facilities and equipment

EVIDENCE GUIDE

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| | <ul style="list-style-type: none">• CUFBRT403A Ensure quality of broadcast output• ICTTC101C Locate and diagnose electronic faults. |
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Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant personnel may include:

- architect
- broadcast engineer
- building personnel
- designers
- equipment operators
- head of department station manager
- sub contracted personnel
- supervisor
- technical director
- other technical/specialist personnel.

Installation may involve:

- entire broadcast facility
- multiple pieces of equipment
- one piece of equipment.

System drawings and specifications may include:

- bay layouts
- detailed component drawings
- equipment schematics
- general assembly drawings
- installation drawings
- modification drawings
- program production drawings
- room/building layouts
- sub-assembly drawings
- systems block diagrams
- technical manuals
- wiring/circuit diagrams.

Requirements and impact may include:

- electrical, e.g.:
 - power requirements
 - grounding
- environmental, e.g.:
 - heat generated
 - humidity
 - lighting

RANGE STATEMENT	
	• proximity to people • noise • ergonomics • functional • operational • physical, e.g.: • size • weight • location • mounting type • relevant legislative and enterprise standards.
Equipment may include:	• communication equipment, e.g. ISDN, RF links • display devices, e.g. monitor • line equipment, e.g. audio/video distribution amplifiers • production video and audio equipment, e.g. sound/vision mixer • record/replay machines, e.g. cameras, audio recorders.
Performance tests to systems may include:	• assessing error performance levels • checking alarms • checking that performance measurements are in accordance with predetermined specifications and meet approved operating margins • testing of protection mechanisms.
Tools may include:	• 240V lead lights • cable identification kit • electrical - power tools • hacksaw • hammers • hand cutters • ladder • pliers, files • screwdrivers • soldering iron • spanners • terminating tools.
Safe work practices include the safe handling of:	• asbestos • chemicals • laser devices

RANGE STATEMENT	
	• materials • tools and equipment • work platforms: • ladders • scaffold • scissor lifts (cherry pickers).
Range of cables may include:	• category 5 capable cable, including solid, stranded conductor, shielded, non-shielded • coaxial, e.g.: • hard line (internal/external) • flexible (internal/external) • underground • aerial • powered/unpowered • multi-core • optical fibre, e.g.: • internal/external • loose tube • tight buffered • air blown • armour plated.
Cable support systems may include:	• backmount frames for distributors • cable trays • catenary wire • ducts • line poles • suspension.
Regulatory and industry standards may include:	• ACMA technical standards • Australian and international standards • Australian building codes and regulations • confined spaces regulations • environmental legislation • fire regulations • heritage legislation • industry codes of practice • noise abatement • OHS • trade practices legislation.
Types of connection may	• audio

RANGE STATEMENT	
include:	• control • data • power • video.
Types of connectors may include:	• crimped • insulation displacement • plug socket (optical) • plug/socket (electrical) • screwed • soldered.
Documentation may include:	• computer generated or manually written, e.g.: • transmission reports • logbooks • equipment maintenance check sheets.
Certification may include:	• installer-based or independent, e.g.: • manufacturer certificate • installer warranty • formal and documented testing procedures and results.
Systems may include:	• analogue • computer/IT • digital.

Unit Sector(s)

Unit sector	
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Competency field

Competency field	Media and entertainment production - broadcast technology
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Co-requisite units

Co-requisite units		