

FEASIBILITY STUDY INTO

RADIO TECHNOLOGIST TRAINING

Commissioned by SYN Media

**By Developing Media Works
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This report was produced by Developing Media Works (DMW). DMW is a private organisation with extensive experience in the broadcast industry that includes project development, delivery and evaluation, station management and training.

David Melzer
melzerdavid@gmail.com
0419 898 322

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This report has been prepared for SYN Media by DMW. The report reflects the findings and views of lead consultant David Melzer, following consultations with stakeholders and relevant others as listed in Attachment 7.

Scope

SYN Media, a community youth station commissioned the report on behalf of five Melbourne community radio stations: 3CR, 3JOY, 3PBS, 3RRR and 3SYN.

The approach to this report was framed by the aim described in the consultant’s brief which reads:

“The overall aim of the project is to research potential accredited training pathways for new technologists, in order to make recommendations to the Melbourne community radio sector on the implementation of broadcast technologist training”

To achieve this aim, this report explores options for the delivery of Certificate IV in Broadcast Technology to potential students in Victoria.

The Certificate IV in Broadcast Technology has been identified as the most relevant qualification to address the shortage of qualified technologists currently available to community broadcasting stations in Melbourne.

The report includes results of consultations with the five community radio stations about their specific technology needs. Focus is given to radio transmission technology as this is specified in the report brief. Key training organisations were canvassed on the options for training people in Melbourne.

Collaboration with training organisations for the delivery of the training was explored. The responses are focused on solutions for the five stations that commissioned the report and which operate in Melbourne. The report also investigates possible training in other areas of technology with perceived shortages.

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Executive Summary

On behalf of five Melbourne community radio stations (FMS), SYN Media sought expressions of interest¹ to undertake a feasibility study into the implementation of accredited training for radio transmission technologists in Melbourne. The brief proposed the Certificate IV in Broadcast Technology. The report has investigated accredited and non-accredited training options available in Melbourne. The options include fulltime as well as short course options.

This report found that delivery of the Certificate IV in Broadcast Technology in Melbourne would be problematic. The course is not currently being delivered anywhere in Australia and only one Registered Training Organisation (RTO) has the course on its scope of registration. The qualification is made up of seven core and twelve elective units. The core units include two units of broadcast technology, three units of information and communications technology (ICT) and two other units, one relating to the industry and one for Occupational Health and Safety (OH&S).

The term 'broadcast technology' covers radio frequency (RF) technology— that which deals with transmitters, antennae and other parts of the transmission chain – as well as the technology of audio production and studio equipment and ICT. Through the consultation process, it became obvious that RF technology is the skill area that is perceived by the Melbourne station managers who were consulted to be in critically short supply. The managers also experience skill shortages in the other technological areas, but see RF as the essential one to include in any training course that is developed. It can be argued that transmission - the technology of broadcasting - is the most critical element of any radio station. Without that technology, or people to maintain it, there is no radio.

The critical issue is that RF technology involves complex equipment and theoretical knowledge. It is a big ask to train anyone who has no previous background or interest in the area or an associated area such as electrotechnology or electrical engineering, in RF technology. The government broadcasters (ABC and SBS) and, increasingly, the commercial broadcasting sector outsource their RF tasks to broadcast transmission providers such as Broadcast Australia (BA). BA trains people in RF technology in a two-tiered system. BA has a national network of 'first in maintainers' (FIMs) who attend sites for maintenance and initial fault diagnosis. The FIMs are supported by a network of more qualified, more fully trained technicians. This model is instructive for community broadcasting.

BA has indicated that it has a shortage of RF skilled technicians and is researching training options as well. BA conducts non-accredited, mostly short course training for its current staff. It has indicated that it is seeking some fulltime courses. There is a wide variety of training providers for relevant non-accredited courses. Accredited course costs vary widely depending mainly on whether trainee salaries are factored in. There are currently no apprenticeship courses that match the training needs of the community stations.

Organisations involved with apprentice training provision require an industry-wide response to future employment needs before they will re-develop apprentice programs to match industry needs. The Victorian Industry Training Advisory Board, Verve, could facilitate a forum. Short of developing Certificate IV in Broadcast Technology in fulltime format, short course delivery is the most pragmatic place to start. Costs are approximately \$400 per unit, \$8,000 for a full certificate or \$700 per day of training per student. Stations interested should determine the best people within their stations to undertake the training. Station technical committees should be formalised to ensure that skills acquired by the station are sustainable and maintained as much as possible even when the people who are trained depart.

¹ SYN Tender brief

Summary of Recommendations

The report recommends some options for the viability of delivering the Certificate IV in Broadcast Technology in Melbourne. The course is currently not being delivered in Melbourne – or anywhere in Australia – despite all sectors of the broadcast industry agreeing that there is a skill shortage now in this area.

Other pathway options explored include courses delivered by commercial non-accredited providers, apprenticeships in similar fields, international training providers and diploma courses.

The courses should be geared, in the first instance, to RF training to provide trainees with sufficient skills to operate as ‘first-in maintainers.’ This would enable them to perform routine maintenance, initial fault diagnosis and determine when a more fully qualified technician might be needed.

Of the options explored, this report recommends that

No	Recommendation	Page
1	FMS take up offer of detailed skills assessment funded through the state government <i>Skills for Growth</i> program	20
2	The FMS urge Verve to convene industry roundtable to detail future technical skill needs for the industry	20
3	The FMS seek National Training Project (NTP) support in arranging short course delivery of the Certificate IV in Broadcast Technology through Triple A Training	21
4	The NTP seek appropriate contracted technicians willing to be trainers and subsequently arrange and support the delivery of Cert IV in Training and Assessment	21
5	CBOnline compile a skills bank database for technical experts that contains their area of expertise, their availability for work and for training	21
6	The FMS compile a comprehensive list of potential appropriate trainees who will benefit from training and as a result be able to assist with station technical issues	22
7	The FMS should revise current contract arrangements with technicians to include a component of training and development of interested trainees	22
8	The FMS coordinate an approach to people with a technical background to offer involvement in community broadcasting and further training	23
9	The FMS urge the review of the NTP to recommend that technical training be included in its scope	23
10	The CBAA adds CUF 40307 Cert IV in Broadcast Technology to its training delivery areas alongside broadcasting and management and assists relevant RTOs to add it to its scope of registration	24
11	The NTP consider a two tiered technical framework for the sector supported by accredited technical training and identify sources of funding support for accredited technical training, including the PPP	24

Introduction

The technical areas of a radio station's operation span four broad areas:

- The transmission chain – antenna, transmitter, studio-transmitter link. All stations use transmitters and antennae to broadcast signals. Most stations in the sector use microwave link technology to connect studios to transmission sites. Historically, transmitters required a range of test equipment to maintain a reliable signal. Newer transmitters incorporate metering for more accessible monitoring.
- The studio and production equipment. These include broadcast mixing panels that aggregate audio from the range of studio sound sources such as microphones, LP and CD players and computerised audio payout systems.
- IT and computer networks. Studio computers are increasingly networked to other parts of the station building and the internet. Audio can be sourced from outside the studio. As the audio production is becoming increasingly digitised and networked, IT systems are increasingly part of the radio program production process.
- Telecommunications. Telephone connections are being increasingly used for access to the internet, moving audio material around and enabling outside broadcasts. Stations are increasingly relying on telecommunications in their technological operations.

Each of the more than 350² community stations in Australia has a broadcast chain that carries the program content from studios, through cable or microwave link, to a transmitter that broadcasts the programs, through an antenna out to the receivers of its listeners. At one extreme, some community stations have state-of-the-art transmitters monitored and maintained by people with up-to-date knowledge of how to get the best out of that machinery. At the other end of the spectrum, there are community radio stations that use the audio section of 40 year old recycled television transmitters to deliver their service.

Unlike the commercial sector and government-funded broadcasters, community broadcasting is generally dependent on volunteers to undertake the majority of the tasks necessary to its operation, including the range of technical areas. Due to the specialised skills and the continuity of service required it is most difficult to attract and retain a volunteer to areas such as broadcast technology. A volunteer bringing appropriate technical skills helps a station enormously. This is especially so for stations dependent entirely on volunteers – as are many community stations. Approximately half of all stations budget to have staff or contractors taking responsibility for their essential technical work.³

Whether stations use volunteers or paid staff, the people involved need to have sufficient skills to ensure that station technical systems keep operating. The challenge is to match people's skills to the station needs. Some people come to community radio with skills and knowledge and some come keen to learn. Community broadcasting has a strong commitment to training. It continually provides training to its participants. Training provides an opportunity for community stations to bridge skill gaps.

Many⁴ community stations do not have either volunteers or paid staff involved in their station who can maintain or repair in one or more of the technical areas needed. When there is no-one involved with the know-how, stations are forced to use commercial third party service providers. In commissioning this report, five stations in Melbourne want to ensure that in the future there will be people at their stations who will be capable of developing and maintaining their technical operations. This report looks at the size and nature of this skill shortage and what training options exist to overcome it.

² <http://www.cbf.com.au/Content/templates/sector.asp?articleid=30&zoneid=13>

³ 2007-08 CBD results show that nationally a total of 173 staff (f/t, part-time or contract) are involved in technical development/maintenance activities. <http://www.cbaa.org.au/content.php/560.html>

⁴ CBOonline figures list 173 technical staff employed in sector of 350+ stations

Background

When community broadcasting started, its participants either came with or learned the essential knowledge and skills required to get a station to air. Technical skills revolved around the audio from turntables, tape players and microphones being mixed in a studio panel, through audio processing and sent to a transmitter site by cable or microwave link and up and out of an antenna via the transmitter.

The vast majority of community stations relied on second and third-hand transmitters. Many stations used the audio section of discarded television transmitters. Most transmitters used in the sector needed a lot of attention and tender care – and people to do it.⁵

As with various aspects of community radio station operations, responsibility for the RF technology – the mechanics in and around transmitters and antennae – was taken by people with some knowledge of that area. They came from a range of sources: government-trained technicians, those working at commercial radio or the ABC and amateur radio operators.

“Each station’s establishment and survival depended on finding people who had these tender skills and a deep understanding of radiofrequency and broadcast technology. In the case of community stations, resources were limited but commitment was high and the necessary technical enthusiasm and talent was tapped on an honorary basis from the community itself. Often with the known or unknown support of community benevolent institutions, such as Telecom Australia (which, incidentally, was established from the ashes of the PMG empire)” - Technically Moving David Sice CBX article, March 2003, CBAA

Over the last four decades, transmitters have become more robust and reliable, studio equipment has comprehensively changed and stations are becoming increasingly dependent on ICT. All stations now need expertise and skills in all of these technical areas. The commissioning of this report indicates that technical training can address these issues.

While stations report the need for people with skills in all technical areas, it is in RF knowledge (knowledge of the transmission chain) that stations report the most critical skill gap. Stations cannot broadcast without it. It is an area for which stations cannot easily find volunteers or even paid staff. They can foresee a time when they may not have access to anyone with the knowledge who is affordable.

The majority of RF technologists currently involved in community broadcasting in Melbourne have been ‘doing it’ for decades. They say⁶ there are very few people under 50 years old in community radio who know RF technology. Despite there being a reduced need for RF technologists through increased equipment reliability, there is still a critical need for them for the foreseeable future.

The trend is reflected throughout the broadcast industry: a reduced need for the number of people required to run Australia’s network of broadcast transmitters, but an ongoing and critical need nonetheless.

⁵ 3PBS, 3ZZZ, 3MBS all used ex-tv transmitter audio part

⁶ Interviews, Greg Segal, Bill Runting 4/9/09

Current Situation

Community broadcasting has trained its participants since its inception. The vast majority of internal training has been informal or non-accredited. The sector has recently embraced accredited training to start to standardise skills and give trainees greater flexibility and mobility. CBAA became a RTO in 2003 to enable it to deliver accredited training in partnerships around the country.

The FMS that commissioned this report are keen to find a way to ensure that in the future they have affordable access to RF and other technical expertise. They have suggested the Certificate IV in Broadcast Technology as a way to cover the range of technical needs.

The Screen and Media training package (CUF07) is designed to meet the disparate needs of the creative industries. It includes a range of units packaged to cover the skills required in the broadcasting industries including the Certificate IV in Broadcast Technology.

The Certificate IV in Broadcast Technology is made up of seven core and twelve elective units. The core units include two units of broadcast technology, three units of ICT and two other units, one relating to the industry and one for Occupational Health and Safety (OH&S)⁷.

One immediate issue that arises is that the course is not currently being delivered anywhere in Australia and only a few RTOs have the course on their scope of registration, none in Melbourne. The complexities of trying to train people to fill the gap in RF skills will be examined in the next section of this report.

Station Priorities:

The technical areas of a radio station's operation span four broad areas: the transmission chain, studio and production equipment, IT and computer networks and telecommunications. Managers reported skill shortages in all of these areas. There was a common view that the need for IT and networking skills would continue to grow.

To address current training needs at each station, managers were canvassed about their priorities for technical tasks and skills needed. In developing training pathways for technologists at community radio stations, the technical tasks they are required to undertake can be mapped against curricula in the package.

However, the most critical need identified by all managers consulted was the need for affordable access to transmission chain skills. All managers saw warning signs when looking at their arrangements for handling RF areas.

Case study: SYN Media

One of the stations commissioning this report, SYN Media, a community radio station licenced to serve the youth community, have no volunteers or staff with RF skills. They have covered this gap by contracting commercial third party providers. They pay commercial rates for this service. They have been paying commercial rates for over five years – even at times of financial crisis when the station's existence has been threatened.

⁷ See Attachment 2: Certificate IV in Broadcast Technology qualification

The next highest priority identified by station managers was IT skills and how IT networks and RF understandings meet. This is seen as a growing need and particularly relevant for the efficient and economic supply of programs to a range of delivery platforms because more and more technologies have IT components. The range of skills required and time needed to be spent in this area are significant and growing.

The next priority task area for the stations in Melbourne is the development, maintenance and repair of broadcast and production equipment.

Other skills considered included OH&S, industry context and project work such as managing outside broadcasts.

Tabulating the tasks specified by the station managers produced a draft composite job description⁸ for a broadcast technologist for the community stations. The stations indicated a willingness to contribute financially to the training of a person in these skill areas who could be shared between the stations. The job description is similar to that for entry level technician positions elsewhere in the industry⁹.

The challenge is to establish curricula to meet these needs that can be delivered as a fulltime option such as an apprenticeship or traineeship, or as short courses that would train people who cannot commit to fulltime employment in these areas.

The RF factor

There are approximately 2,400 licenced FM and 240 licenced AM broadcast transmitters in Australia. Each of them has an antenna; each of them is linked to an audio source, such as a studio, and each needs the attention of people who know about RF technology. Modern transmitters need less attention and maintenance than older ones. It still takes time to maintain transmitters, but not as much time as it used to.

“Nowadays on transmitter sites, you read meters once a month, you used to check them every few days”. - Brian Nash, Justware, Adelaide

*“The most frequent task in transmitter maintenance is cleaning dust from air intake and filters – you don’t need an electrical engineering degree for that.”
- Bill Runting, Waratel, Melbourne*

While advances in transmitter technology have meant less time is needed to maintain them, it is still a necessary and ongoing task.

*“Transmitter and RF gear has got more reliable and so it is a long time between servicing. The trouble then is that when something needs to be done it can cause panic as no-one at the station may know what to do.”
- David Sice, CBAA Technical Consultant.*

ABC/SBS

How the rest of the broadcasting industry has addressed technical skills training is instructive. ABC and SBS have never owned a transmitter. “Once the program leaves our studio, it ceases to be our responsibility.”¹⁰ Originally, the government owned and maintained the national transmitter network on behalf of the broadcasters through the Post Master General’s Department which morphed into Telstra.

⁸ Attachment 3: Draft composite job description for Melbourne five station broadcast technician

⁹ Attachment 4: ABC Technician Job description

¹⁰ Ken Brand, Content Distribution Centre Supervisor ABC WA

While in-house broadcast engineers design national transmission infrastructure for the government broadcasters, they outsource the maintenance of the transmission chain. BA currently undertakes this role for the ABC and SBS.

Commercial sector

While commercial radio station chief engineers might design transmission infrastructure, they are increasingly looking to outsource their transmitter care and maintenance to third party providers. BA is the largest employer of RF technicians in the country. They employ 130 technicians across 12 regional centres. Their network includes contract staff and a national network of 800 'first in maintainers'. 'First in maintainers' may not be fully trained technicians, but have received sufficient training to do regular maintenance and preliminary fault diagnosis. They can then determine whether or not a transmitter needs the attention of a fully qualified technician.

Demand

As the time required to maintain transmitters reduces, staff needed for RF functions decrease. With increased reliability and the move to greater redundancies in transmission chain infrastructure, the reduction in the number of RF technicians has meant the industry has retreated from formal training in RF technology. The industry standard qualification, the Broadcast Operators Practicing Certificate (BOCP) ceased being taught in Melbourne in the late 90s.

Of the more than 40 community stations in Victoria, there are nine metro-wide community radio stations in Melbourne. There are three technicians providing RF services for the majority of the metro-based stations¹¹. While the demands on RF technicians have reduced, the need for every station to have access to these skills is ongoing and critical to the stations' operation. The three main Melbourne RF technicians in community radio are all over the age of 50 and have indicated an interest in working less in this area. While most community stations are currently managing their transmission chain, they can foresee problems in the near future.

Case study: 3CR

One of the stations commissioning this report, 3CR, unusually, operates an AM transmitter, which is nearly 15 kilometres away from the station. The technician who installed and maintains the set up, not unusually, takes holidays. The 3CR Station Manager holds her breath for most of those holidays because the fellow who is the standby transmitter fixer does not have a car to drive to any transmitter mishaps.

Each community station involved in commissioning this report says they need people to be trained in RF skills. They can envisage a time when the people currently looking after their transmission chain are no longer available.

"There seems to be a sector-wide shortage on tech skills (particularly RF skills), this is likely to worsen as many of the sector's professionals in these areas are nearing retirement age. IT knowledge and skills are constantly becoming more and more urgently required by studio and RF techs as technologies move in this direction."

- Dave Houchin, RRR manager

¹¹ Runting (PBS, JOY, RRR) Segal (CR, KND) Gibson (MBS, ZZZ)

The worry about the erosion of RF skills is not only felt by community broadcasting. The concern of the community stations about potential retirement of the current RF technicians is shared by other parts of the industry.

Subject >Re: Apprenticeships

Not to mention Broadcast and Electronic Technicians. I am 61 next week and have been at the coal face of Broadcasting since 1969. I currently oversee a major ABC site with 4 high power FM services and 4 TV services. I have no trainee, I have no one the slightest bit interested in becoming a trainee. Victoria has lost 35 broadcast technicians in the past 7 years. The recent crop of technical aspirants have no RF/Transmission experience. The state is run on a shoe string with less than 10 technicians servicing 47 sites. I notice the ABC has hardly any technical people of its own.... RMIT closed their BOCF course a decade ago. So the bottom line is do we have any training in place to address future needs of broadcasting services? Not to mention the digital TV roll out? I notice the analogue turn off has been put back until 2012. as for servicing high power outlets ... who are you going to call with hands on experience of solid state 50kw Broadcast Transmitters when all of us experienced baby boomers retire in the next 10 years?

- Steve Gee, 2/8/2007 downloaded 25/8/2009 from ABC discussion forum <http://www2b.abc.net.au/tmb/Client/Message.aspx?b=10&t=2&a=0&ps=20&m=2002&dm=3>

Broadcast companies are aware that there are few qualified technical staff to replace those retiring. They see training as an ongoing requirement. It could take years for staff to emerge from training capable of taking on technological responsibility and other parts of the industry are looking to establish training pathways to address this.

"In Brisbane and Sydney, the age profile of our workforce has led us to put a couple of trainees through a two year TAFE electronics course".

- David Wright, BA National Field Manager.

This comment highlights a central issue for the training of people working on RF technology. There is a widespread perception that anyone being trained in transmission chain technology needs solid background knowledge or interest in electrotechnology. This has been the case historically. The complexities of theories and equipment that come together in the transmission chain represent a significant body of knowledge and practice.

Outsourcing

While outsourcing these services is an efficient arrangement for the government and commercial broadcasting sectors, the community sector may not find such an arrangement affordable, sustainable or desirable. Codes of Practice describe how stations are committed to community participation in all aspects of the stations' operation. This includes its technical operation. Community stations are committed to maintaining operational tasks internally, where possible, rather than outsourcing them.

Whether RF skills are managed in-house or outsourced depends to a large extent on the sector's ability to build a training pathway that sustains the skills internally. Community stations see outsourcing transmitter care as a last resort. However, at least one station in Melbourne has gone down that path¹².

The need for technical skills in the other area of stations' operations has grown. While each station commissioning this report confirmed that RF technology was the central knowledge area or skill that was in the scarcest supply, they identified other technical skills that were needed. These include those needed for the development and maintenance of studio equipment, IT and computer network skills. These functions are generally carried out by internal staff in all three sectors. All these skills need to be addressed in any training solution to the current skills gap

¹² SYN Media has contracted TXA to maintain its transmitter at Mt Dandenong.

Where are the gaps

There has been significant recent research into the accredited training needs of the industry. Innovation & Business Skills Australia (IBSA) is one of eleven Industry Skills Councils within the Australian vocational education and training (VET) sector. Its Environment Scan (2008) researched national training needs across the creative industries¹³. This report indicates a number of high priority in-demand skills including those covered by the Certificate IV and Diploma in Broadcast Technology.

Verve is the industry training advisory board (ITAB) for the cultural and recreation industries in Victoria. It has undertaken widespread consultation with industry for its recent research. Verve consulted with representatives of community broadcasting and other broadcasting sectors.

In its state-wide Skills Needs Report of 2009¹⁴, Verve notes that there is a critical need for skills development in the radio sector. Developments in digital broadcasting exacerbate this need through increased demand for content and delivery platforms. Verve supports the community radio sector looking at working collectively to use the Group Training Model to help address the need for qualified technicians to work in the field.

These training organisations have highlighted that it is not just an RF skill shortage being experienced industry-wide.

“The skills shortage is in both traditional broadcast areas (such as transmission management, design and implementation) and emerging/crossover areas such as IT infrastructure and web delivery. Industry leaders say the skills shortage will severely impede the sector’s growth and innovation if it is not solved.” SMPTE paper

Changes to equipment efficiencies and more importantly, the infrastructure of transmission through digitisation, mean that technical skill requirements are changing. Gaps in technical skills are broadly evident. It is a critical time for dealing with these changes.

What sort of gap

There are challenges for designing training pathways that are best approached on an industry-wide basis. A good example of this is whether it is possible to train people who do not have a background in electrotechnology or RF skills. In highlighting the urgent need for accredited training in the industry, training organisations are yet to define the magnitude of the need. Questions that arise out of the consultations include

- how large is the need?
- where are the people interested in teaching?
- where are the people interested in learning?

While the largest employer of RF technicians, BA, estimates they are about 10 RF technicians short nationally, they are currently only looking to train two people in Brisbane, one in Sydney and one in Canberra. It is difficult to be exact about the numbers needed within community broadcasting because of the nature of the sector.

The FMS commissioning the report have ‘pooled’ their needs and gauged that they could afford to collectively employ the equivalent of one additional fulltime staff person to fulfill some of their technical needs. RF technology is not the only skill area needed – it is the essential one - and the attached job description is the composite of technical priorities between the stations.

¹³ see pages 23, 27, 28, http://203.89.242.85/downloads/Escaan_II_-_17Mar2008.pdf

¹⁴ <http://verve.org.au/fileshare/1/Final-Draft-Skills-Needs-Report.pdf>

Extrapolating to other capital cities and beyond, it appears that community broadcasting could support the training of the equivalent of one fulltime technical trainee in each mainland state. The term 'equivalent of one fulltime' is used because it may be that the training is delivered in short course or skill set formats.

Through the consultations for this report, it is evident that there are people and organisations with the capacity to deliver the form of accredited training required. Station management is keen to invest in training people to meet station needs. The challenge is to engage with people who are interested in acquiring skills in an area that is not growing: RF technology.

Kordia is a New Zealand government-owned company operating in Australia in the broadcast, IT and telecommunications field. Kordia had been told of a looming skill shortage in RF technology. They developed a range of units and training material and were investigating RTO registration. Despite what they were led to believe was significant demand for training, they were barely able to get any Australian 'bums on seats'.

Accredited Training: Certificate IV in Broadcast Technology

Stations have expressed a need for a range of skills to be addressed through accredited training. The FMS have developed a hypothetical job description comprising the skills they feel are priorities for the near future. State ITAB, Verve has assisted the process by mapping these tasks across to curricula from the Certificate IV in Broadcast Technology.

To complete the full qualification a student must complete seven core and 12 elective units. Units marked with an asterisk* have prerequisite units¹⁵

The Core units are

Broadcast technology

CUFBRT402A Maintain broadcast equipment and facilities
CUFBRT403A Ensure quality of broadcast output

ICT support

ICAI4030B Install software to networked computers
ICAT4221B Locate equipment, system and software faults
ICTTC102D Repair electronic faults

Industry context

CUFIND301A Work effectively in the screen and media industries

OHS

CUSOHS301A Follow occupational health and safety procedures
(Note: this unit is being introduced in v1.1 of CUF07 to be released shortly)

The most relevant 12 elective units

Broadcast technology

CUFBRT401A Install or upgrade broadcast equipment and facilities
CUFBRT404A Coordinate outside broadcasts

Broadcasting

CUFBRD301A Perform basic transmission operations

Electronics

*UEENEEH072B Find and repair faults in the RF sections of electronic apparatus
*UEENEEH073B Find and repair faults in professional audio reproduction components
*UEENEEH080B Diagnose and rectify faults in digital transmission systems

ICT support

*ICAS4109B Evaluate system status
ICAS4114B Implement maintenance procedures
*ICAS4127B Support system software

Training and workforce development

TAADEL403B Facilitate individual learning
BSBWOR404A Develop work priorities

Industry context

CUFIND401A Provide services on a freelance basis

¹⁵ See Attachment 3 for pre-requisites

Mapping

As can be seen from the outline above, the seven core (compulsory) units of the Certificate IV in Broadcast Technology include three units in ICT. Of those, one is about network software installation, one deals with hardware and software fault diagnosis and one covers the repair of electronic faults in ICT systems. These units start to address the tasks specified by station management in the area of ICT.

Two of the other core units address studio-based skill needs: one unit covers maintaining equipment and the other addresses the quality of the audio output. These skills are listed as requirements by all station managers, but are prioritised behind ICT and RF skills. The other units are common to many qualifications: OH&S and a unit dealing with the nature of the specific industry, its structure, politics and procedures. The core units map well to the priorities identified by station management with the exception of RF skills. This gap can be addressed in the remaining 12 elective units that go with the core units to make up the qualification.

Time spent on specified technical tasks at stations should guide the selection of the 12 elective units. The issue of transmission chain skills invites at least one unit in this skill area. The trick is to ensure that trainees have sufficient skills and knowledge to undertake the task required of them by a station, balanced against the need to fit all other required skills into the qualification and the likely time to be spent on each skill.

Views within the industry are ¹⁶ that anyone working with RF technology needs a background in electronics or electrotechnology¹⁷. People with a background in these areas could undertake the Certificate IV in Broadcast Technology and be reasonably expected to then be able to maintain and repair transmitters and antennae.¹⁸

If community broadcasting is aiming to employ technicians only in RF areas, then it may be prudent to more fully follow this pathway. However, with limited training resources available, it makes more sense to pursue a broader spread of skills as a primary objective. Creative ways for community broadcasting stations to attract participants with electrotechnology backgrounds are discussed later in the paper.

By including the most relevant unit for RF skills at the Certificate IV level the trainee can become familiar with the competencies. Two other units from the electronics qualification would enable trainees to repair audio equipment and other digital systems. This sets up a possible process where the qualification could be delivered in short course or 'skill set' format for stations wanting to skill people up in focused areas. To further enable this, the remaining electives could cover as many of the skill areas prioritised by station management as possible.

Given the emphasis on ICT skills, there are a further three units that would enable trainees to evaluate and maintain systems as well as software. For further studio-based skills there is a unit addressing upgrade and installation of equipment. There is a unit that addresses technical skills required for outside broadcasts and one that covers switching or routing programs. The latter is useful with stations wanting to distribute programs across platforms and to other broadcasters. For the full qualification enabling a trainee to work productively in the industry, three 'contextual' units round out skills required. One develops training skills so that the trainee would be able to effectively train others, one unit is about developing work priorities and the last suggested unit of the 19 that make up the full qualification is one that addresses how the trainee can provide services as a freelancer; that is, work with a number of stations¹⁹.

¹⁶ Discussions with Jeff Dale, trainer co-ordinator, BA, Greg Segal, community broadcast technician, Danny Dutton, State Manager, TXA.

¹⁷ myfuture.edu.au/services/default.asp?FunctionID=5051&Action=DisplayState&StateCode=VIC&ASCO=431611B#EduTrain

¹⁸ Graeme Grepper, Head Trainer, BA. BA seek those prior qualifications.

¹⁹ Attachment 3: Job description mapped to units from the Certificate IV in Broadcast Technology

First In Maintainers

Before looking at training delivery methods and pathways for the suggested curricula, it is worth examining the issue of RF skills further. The BA model of having 'first in maintainers' with limited training could enable stations to undertake some RF fault diagnosis without necessarily having to call in highly skilled technicians every time the transmitter burps or ... coughs.

First in Maintainers are trained to be able to undertake regular RF maintenance and also be able to diagnose problems. They have not been trained to undertake repairs - these would be referred to a more qualified technician.

Community Broadcasters may consider this a more viable option as it may be possible to train interested volunteers via a short course to complete these tasks while contracting out major repairs and installation work. The Certificate IV in Broadcast Technology can be broken up and delivered in 'skill sets'. The skill sets could cover three areas: Studio maintenance, ICT and transmission.

Skill sets are defined as single units of competency, or combinations of units of competency from an endorsed Training Package, which link to a licence or regulatory requirement, or defined industry need. Skill sets are a way of publicly identifying logical groupings of units of competency which meet an identified need or industry outcome. Skill sets are not qualifications.

Attachment 3a suggests skill sets of units within the 19 recommended units that provide short course delivery options. It should be noted that these skill sets have not been the subject of any industry consultation or endorsed in any way. They are only a suggested grouping that would provide competency outcomes for students and stations. A skill set for a first in maintainer may look like this:

Target group	This skill set is for people working in transmission areas of community broadcasting stations	
Units	CUSOHS301A	Follow occupational health and safety procedures
	CUFIND301A	Work effectively in the screen and media industries
	CUFIND401A	Provide services on a freelance basis
	*UEENEEH072B	Find and repair faults in the RF sections of electronic apparatus
	*UEENEEH080B	Diagnose and rectify faults in digital transmission systems
	CUFBRD301A	Perform basic transmission operations
	CUFBRT404A	Coordinate outside broadcasts
	TAADEL403B	Facilitate individual learning
	BSBWOR404A	Develop work priorities
	* Units marked with an asterisk* have prerequisite units. RTOs offering this skill set need to take these requirements into account when assessing candidates. Details of prerequisites can be found in the respective units in the parent Training Package.	
Pathway	These units of competency provide credit towards the following qualification (and other qualifications that allow for selection of the same units):	
	<ul style="list-style-type: none"> CUF40307 Certificate IV in Broadcast Technology. 	
Suggested form of words for Statement of Attainment	These units of competency meet industry requirements for transmission work in community broadcasting stations.	

Existing Training

With the exception of Central Perth TAFE²⁰, the current industry training in RF technology is non-accredited. The third party providers that maintain transmitter sites for commercial and government-funded broadcasters provide non-accredited training in varying degrees to their staff.

After the BOCF certificate was dropped by RMIT in Melbourne and elsewhere around the country over a decade ago - because of insufficient demand – there is little accredited training currently available. Those who are interested in training for a career in broadcast transmission have to approach it through the industry.

BA is the largest employer of RF technicians in the country. BA says they need people with basic understanding and even qualifications in electronics before teaching them RF skills. BA says that the age profile of their current staff in Sydney and Brisbane (they are getting on) means there will be a need to put new trainees through accredited Certificate III courses in electronics.

Kordia recently sold its national transmission infrastructure to BA. Despite its staff moving across to BA, Kordia still has relevant RF units to deliver and charges approximately \$650 per unit. They are not currently accredited and partnership with an RTO is required to enable Kordia's courses to be accredited²¹. Scanditel is a Swedish broadcast technology company offering RF technology training in Australia. Two-day non-accredited courses are being run in Australia and New Zealand. Scanditel charge \$680 per day for the two-day courses²². An engineering degree is a pre-requisite for the courses.

During this research, other providers of technology training have become apparent. These include overseas organisations such as the BBC training arm, BBC Training, and in the US, the Society of Broadcast Engineers (SBE). SBE highlights the valuable role that a professional association can play in industry development. In Australia, the Society of Motion Picture and Television Engineers SMPTE has started addressing certification for engineering qualifications for parts of the industry.

Apprenticeships or traineeships are two to four-year training programs that offer extensive on-the-job training (80%) with school-based theory (20%).. The advantage of an apprenticeship is the depth and breadth of knowledge acquired. The disadvantage for a community radio station is that all the knowledge is invested in one person. (The challenges of fuller training programs are discussed on p18).

In 2005, community stations financially supported the apprenticeship training of a broadcast engineer, Sam O'Reilly²³. Sam completed his apprenticeship without undertaking any RF units. CAAMA radio in Alice Springs has trained a number of Indigenous apprentices, the most recent having been trained at Skillstech, a TAFE in Brisbane. The cost of apprenticeships or traineeships vary. Pay rates depend on the age of the trainee²⁴ and range from \$25 to 30,000 pa. For apprentices who travel large distances to school, classes can be in a block release format – four to six weeks of schooling per year, all in one block. Again, course costs vary, but are approximately \$650 per block per trainee²⁵.

²⁰ Central TAFE has the Dip Broadcast Technology on its scope. It uses it for RPLing, but has accredited trainers for RF training according David Zanich, Learning Portfolio Manager for Engineering,

²¹ Attachment 5: Kordia course brochure

²² Attachment 6: Scanditel brochure

²³ Case study: Sam O'Reilly

²⁴ <http://www.workplaceauthority.gov.au/Pages/default.aspx>

²⁵ Skillstech, Queensland. Certificate III in Electrotechnology block release.

The only RTO with the Certificate IV in Broadcast Technology listed on their scope of registration for national delivery is Triple A Training in Brisbane. Estimates of course costs are just under \$400 per student per unit and just under \$8,000 per student for the 19 units that make up the full qualification.

Central TAFE in Perth has the more advanced qualification, the Diploma in Broadcast Technology on their delivery scope. This means they are capable of delivering at the Certificate IV level and have accredited trainers available.

How to address the gap - Training needs, what is possible

Costs are difficult to detail without course numbers, structure or duration. Triple A Training and Central TAFE in Perth both believe they can deliver nationally and in partnership with local organisations. There is funding support available including the Productivity Places Program (PPP) - part of the Australian Government's Skilling Australia for the Future funding.

Other sources of funding support could be the community broadcasting NTP. The community broadcasting sector focuses on accredited training for a range of reasons that include standardisation and portability of qualifications. The CBAA has become an RTO in order to facilitate and deliver nationally-accredited training curricula in the area of broadcasting, management and training.

Accredited training offers the community radio sector the opportunity to establish national standards in training between radio stations and to give certificates and statements to broadcasters which are recognised by the sector and the rest of the media industry.

– CBAA Website

Any training response designed to meet the broadcast technology skills gap will come from curricula that are nationally accredited. There are five RTOs within the community broadcasting sector capable of delivering accredited training.

- Triple A Training in Brisbane
- Radio Adelaide
- CBAA
- Diversitat in Geelong
- Goolarri Media in Broome

Within the sector, only Triple A Training has the accredited Broadcast Technology qualifications on its scope enabling it to deliver the curricula. Triple A Training has not delivered training in RF technology. The focus of this paper is on detailing solutions to the need for technical skills within the community broadcasting sector. While similar needs in the broader industry are relevant, options for the community sector will differ because of the participatory nature of the sector. The participatory nature of community broadcasting means that keeping as much of the broadcasting process - as much of a station's operations - in the hands of its volunteers is seen as desirable.

Notwithstanding this, the response to training adopted by the commercial sector can be instructive. The structure of the RF technology workforce determines training needs in the commercial sector. The structure and nature of the community broadcasting workforce can determine the response to its training needs.

Structure of workforce and training

In simple terms, companies like BA have a national network of technicians. They range in skill levels – and hence training undertaken – from the 130-odd highly skilled technicians operating nationally from central control centres to 800 or so FIMs. The FIMs are people local to transmission sites who undertake tasks such as routine meter reading or other maintenance and can be called in for initial fault diagnosis. FIMs may not necessarily be employed fulltime by BA but rather be kept on a retainer. They may work at the local TV repair shop or even butcher. FIMs rarely receive more training than transmitter familiarisation and basic fault diagnosis.

As previously discussed, the highly-skilled technicians capable of dealing with the full range of RF issues ideally need backgrounds in electrotechnology. A Certificate III in electrotechnology is regarded as the barest minimum of training required. It should be noted that redundancies built into the transmission chain – that is the development of standby machinery that kicks in whenever there is failure in the main set up – does reduce the need for ‘emergency’ attendance by the highly skilled technicians.

In detailing training options for the stations commissioning this report, the writer is mindful of the applicability to the broader sector. There will be situations for community broadcasting stations where there is no alternative for dealing with transmission chain issues other than to call in a commercial provider.

Examples of this include the Remote Indigenous Broadcasting Scheme where stations have little choice but to call in commercial service providers. Similarly, 70% of community stations are outside capital cities and their access to people with RF skills will be limited.

Case Study

Wangki Yupunapurru, 6FX Fitzroy Crossing. The station has an AM transmitter to better reach the many outlying communities throughout the Kimberley's Fitzroy Valley. The station has suffered from lightning strikes. The station has recently been off the air for months because of issues to do with the moisture in the earth mat surrounding its antenna. The station manager travelled to Sydney to complete problem diagnosis and access relevant testing gear²⁶.

In examining training options for community broadcast stations, it is critical to factor in that almost half of the community stations across Australia employ no staff at all²⁷. This has implications for technical training as well as their ability to afford commercial service providers.

Setting aside, for now, the challenge of attracting people in volunteer-based organisations to undertake training, the accredited technical training needed for community broadcasting splits into two categories: full courses, extending over a number of years that would equip people with sufficient skills to develop and maintain transmission systems as well as the other technical needs specified above; and short courses, run over a number of days, that would introduce people to the range of skill sets.

The creative Industry Training Advisory Board in Victoria, Verve, addresses the CUF 07 package from which the Certificate IV in Broadcast Technology comes. Verve offers programs to assist training development. One is a detailed training assessment under the *Skills for Growth* program. The FMS could take up the offer of assistance with a detailed training needs assessment. Taking up the offer of assistance would produce a more detailed list of station training needs and further advance the process of meeting those needs.

²⁶ Chris Daly, 6FX Station manager

²⁷ CBOonline

Recommendation 1 : FMS take up offer of detailed skills assessment funded through the state government *Skills for Growth* program

As previously mentioned, RMIT in Melbourne stopped delivering BOCP over 10 years ago. To re-establish that course or a dedicated apprenticeship or traineeship program, government and industry support would be essential. To attract government support for a new apprenticeship program, there needs to be obvious employment outcomes.

There are varying opinions²⁸ as to the minimum number of fulltime jobs that need to be available for qualified apprentices or trainees before any training organisation would develop a specific training program. Whether this level of employment needs to be available in each city in which a course is offered, or nationally, has not yet been detailed. These employment objectives are beyond the capacity of community broadcasting. The employment commitment required for the development of apprenticeship-type training requires an industry-wide response. While the facilitation of that response is desirable and potentially valuable, it is beyond the brief of this paper.

Verve recently convened a screen industry-wide forum to address training needs and has developed a traineeship program. Verve could convene a broadcast industry-wide forum to further gauge the level of need and commitment from industry to the development of accredited training in broadcast technology. As we have seen above, this level of employment commitment to justify the re-development of a broadcast technician apprenticeship or traineeship will not come from the community broadcasting sector alone. Community broadcasting may be able to commit to one fulltime job in Melbourne. To achieve an employment commitment to the six-job minimum needed requires an industry-wide response. Not only the commercial and government-funded radio stations but also the likely employers of broadcast technicians and the third party infrastructure providers, BA, TXA and Kordia should be consulted. BA is keen to co-operate with other sectors to address the future skills needs of the industry. They want to attend any roundtable discussion on future skill needs²⁹.

Recommendation 2: The FMS urge Verve to convene industry roundtable to detail future technical skill needs for the industry

There are complexities to be considered in convening an industry-wide approach to the skills gap. If it is to be a national approach, Verve will need to engage with the appropriate protocols within the VET sector for a national forum. Similarly, if the training package required goes beyond CUF07, other Industry Skill Councils would need to be involved. The FMS should leave these VET sector sensitivities to the training industry experts at Verve.

Short course, long course

Single unit or short course technical training of community broadcast volunteers would familiarise trainees with the three main skill sets identified by the FMS. The other technical units built into the Certificate IV in Broadcast Technology can be delivered in either short course format – one unit or skill sets of units at a time – or as a full course depending on availability of trainees.

In order to deliver the Certificate IV in Broadcast Technology in Melbourne, an accredited provider has to be engaged. Currently, only Triple A Training in Brisbane and Central TAFE in Perth have the course on their scope.

²⁸ Dominic Schipano, CITT, regards 6 jobs as a starting point for developing a group training scheme in a population centre. David Zanage, Central TAFE, Perth, thinks 16 the figure if looking at a national program.

²⁹ David Wright, National Fieldwork Manager, BA

Although neither has delivered the course yet in Victoria, they are both interested in doing so in partnership with local trainers³⁰. Short course training would combine on-the-job training, course work and online support. Onsite student training support would be the responsibility of the host employer or via a local trainer.

There is no Melbourne-based RTO within the sector to partner Triple A Training in this role. The options are for Triple A Training to engage local colleges with experience in training in similar courses, partner with local non-accredited training providers such as Kordia (BA do not have a trainer based in Melbourne) or to involve the CBAA as an RTO capable of delivering the course. There are a range of local options such as RMIT, 370 degrees or Swinburne which are experienced at delivering technical units in the ICT and electronics area. It makes sense for the community sector to further build its training capacity but to engage external providers where the sector cannot provide a component of the training process.

Further short courses in Certificate IV in Broadcast Technology could be delivered to cover skills such as ICT and studio and production equipment. The report recommends that the FMS ask the NTP to negotiate with Triple A Training to put together suitable short courses

Recommendation 3: That FMS seek NTP support in arranging short course delivery of the Certificate IV in Broadcast Technology through Triple A Training

Given the experience of Central TAFE Perth in delivering accredited RF training – they seem to be the only accredited training organisation to be currently doing this – it is worth exploring their role in delivering fulltime courses such as traineeships further. The FMCS should engage the NTP in the industry-wide response to the redevelopment of broadcast traineeships with a view to Central TAFE Perth delivering in partnership.

Trainers

A further ingredient in developing the above training options for the Melbourne stations is to provide local trainers. The technicians who are currently contracted to stations to provide these services are the obvious choices to provide training – if they are willing and able. They are familiar with the structure of stations and are sufficiently competent to be contracted by the stations. Being competent technicians does not guarantee their skills as trainers. For the technicians keen to act as trainers, a pre-requisite would be that they undertake a training qualification.

Recommendation 4: That the NTP seek appropriate contracted technicians willing to be trainers and subsequently arrange and support the delivery of Certificate IV in Training and Assessment to them

As an alternative – in case current technicians are not willing to act as professional trainers - it has been suggested that there are many other technicians who would be willing to train people in short course units in partnership with a sector RTO. (These technicians could also provide the back-up technical support in cases where stations cannot provide in-house expertise to solve technical problems.)

Recommendation 5: CBOonline compile a skills bank database for technical experts that records their area of expertise, their availability for work and for training

³⁰ Mike Scott, Manager Triple A Training, David Zanich, Learning Portfolio Manager Engineering Central TAFE

Trainees

The report heard that there is a shortage of people willing to be trained in broadcast technology. The report recommends that the stations compile a comprehensive list of potential trainees who will benefit from training and as a result be able to assist with station technical issues. Stations should be mindful that putting volunteers or staff through short course training will not necessarily avoid the need for fully qualified technicians.

“Short courses will probably not achieve a great deal unless the person being trained already has a considerable amount of flying hours in electronics, at the very least an electronic trade under their belt and a taste for RF and high power equipment.

- Christian Burnat

This highlights the issue that for a community broadcast participant trained in RF technology to be effective; they would need, at the very least, an extremely strong interest in the area and preferably some previous knowledge.

“Teaching someone Certificate 4 in Broadcast Technology isn’t going to make you another Greg Segal”

- Nicola Joseph, CBAA Training manager

Recommendation 6: The FMS compile a comprehensive list of potential appropriate trainees who would benefit from training and as a result be able to assist with station technical issues

Issues and Perspectives

#1: Current contractors

Sensitivity to currently contracted community broadcasting technicians’ livelihoods is needed in the development of any training program. The technicians have generally displayed a commitment to the community sector when they could have received better remuneration and conditions in other sectors.

The development of technical skills in other station participants may lessen the demand for existing practitioners’ time. They need to be consulted in all steps of the process to ensure that new trainees are not seen as threats to the business of current technologists. Current practitioners should be involved in the training process for the new trainees. Consideration could be given to including in contracts, if not already there, clauses about involving and training other people in technical areas at the station.

Recommendation 7: The FMS should revise current contract arrangements with technicians to include a component of training and development of interested trainees.

#2: Inability to finding appropriate people willing to undergo training.

There are multiple approaches to this issue that are not mutually exclusive. A basic knowledge of electrotechnology is considered to be a basic pre-requisite for people to be trained in RF skills. Stations could actively seek out these people. Two sources have been suggested: people who are currently undertaking studies in this area (there are several courses in Melbourne and students may choose to add relevant electives to their course if they are aware of the interest in their skills) and people involved in amateur radio. Both have historically been sources of technical volunteers for community broadcasting. The need for creative approaches to attracting skilled volunteers arose in the report. This revolves around luring people out of amateur radio clubs and electronic engineering courses to consider training to participate in the technical maintenance and development of community broadcasting. The report recommends that FMS co-ordinate an approach to people in Melbourne with a technical background, to offer further training.

The other source is people working in other parts of the broadcast industry – the commercial sector or third party providers – who could well be interested in supporting the community sector if they knew there was a need.

Recommendation 8: the FMS co-ordinate an approach to people with a technical background to offer involvement in community broadcasting and further training

Stations should assess whether their current structures are attracting and keeping sufficient participants to meet their needs in the technical area.

#3: Sustainability and Worst Case Scenarios

Community stations have been a traditional training ground for people who then move into other sectors of the broadcasting industry. The sector has accepted this process. The NTP funding goes a small way towards recognition of this function. There is little that will prevent a community broadcast participant from moving through the sector to a better remunerated situation in the commercial or government sectors. Many people who do move through to other sectors, having received their grounding in community broadcasting, remain involved in the latter because of the ongoing commitment that may have brought them to the sector originally.

This is a preferable scenario to forcing people to participate in a station through contractual obligation. However, stations need to be careful about offering significant, accredited and subsidised training to people who may leave. One solution is to include a bonding period for a traineeship or long training course. Another approach is to build broad participation around technical areas. Purposefully developing technical committees can result in skills and knowledge being shared and maintained in the station rather than invested in one person who could 'walk'. For community stations, the issue of maintaining a sustainable technical skill base can revolve around a technical committee being structured so that skills that are developed can be spread as widely as possible.

#4 Crisis - what crisis?

There are mixed opinions about the effect of experienced RF technicians reaching retirement age. Some people in the industry say that the market will look after itself, that there is no need to worry about training and that the move to third party providers (Broadcast Australia, Kordia, TXA) will guarantee that there will always be a commercial option for community stations. Others have said that community stations may not be able to afford the commercial providers and technical training may be a way to avoid having to rely on the market.

#5: Technical training – an ongoing need

Technical training is an ongoing issue for the sector. Technical skills needed at radio stations are the ones that are most rapidly changing. This will continue. While the FMCS may find solutions to their training needs in the near future, they are among the most well-resourced stations in the sector. There needs to be a nationally co-ordinated approach to technical training for the sector. Whether or not other parts of the industry participate in a national approach to technical training, the community sector has specific and unique needs.

A review of the NTP is due this year. Technical skill development sits alongside those of on-air presentation and management for the community sector.

Recommendation 9: That the FMS urge the review of the NTP to recommend that technical training be included in its scope

If technology training is to be a part of the sector's future training framework, the NTP could support the CBAA as an RTO to put the course on its scope for delivery and offer the course to stations in the future. As the technical skill shortage is nation wide, this will allow partnerships for accredited training with current providers of non-accredited training.

Recommendation 10: That the CBAA adds CUF 40307 Cert IV in Broadcast Technology to its training delivery areas alongside broadcasting and management and assists relevant RTOs to add it to its scope of registration

The challenges of dealing with national transmission networks have been addressed by commercial providers. In simple terms, they (currently BA) have a network of onsite staff who have had sufficient training to undertake routine maintenance of transmitters and parts of the transmission chain as well as basic fault diagnosis. These FIMs are supported by a network of more highly qualified technologists who can either guide the onsite staff through repairs, or make arrangements to attend themselves.

A dilemma arises in this report: the Certificate IV in Broadcast Technology will not give people without a background in electrotechnology sufficient skills to do any more than routine maintenance and basic fault diagnosis in the transmission chain. This dilemma is addressed if community radio stations adopt a similar two-tier training model to that of the commercial providers.

By putting volunteers and others through the Certificate IV in Broadcast Technology, they can develop a range of technical skills in their staff, including capabilities equivalent to FIMs. The source of the second tier of skilled technologists is discussed later.

Recommendation 11: That the NTP consider a two-tiered technical framework for the sector supported by accredited technical training and identify sources of funding support for accredited technical training, including the PPP

Conclusion:

This report sought to research potential accredited training pathways for new technologists, in order to make recommendations to the Melbourne community radio sector on the implementation of broadcast technologist training. The pathways for training are not straightforward. The Melbourne community radio stations have expressed a need for technology training in three areas: RF, ICT and studio and production equipment.

Training in all three areas can be delivered through the Certificate IV in Broadcast Technology. Two main issues arise with the delivery of this qualification.

The qualification is not currently being delivered and the only two organisations with it on their scopes of registration are from interstate. Adding to the complexity of delivering the course would be the need to organise partnerships for local hosting.

The second issue is that although RF or transmission chain technology can be covered in the qualification, it cannot be covered in sufficient depth for trainees without prior knowledge or qualifications to be able to do any more than routine maintenance and basic fault diagnosis.

This leads to the possibility of recruiting people with electrotechnology backgrounds and establishing a two-tier system. All community radio stations could have access to a person with basic transmission chain training who could be supported by a national network of fully trained technologists.

Other opportunities also became apparent during the research for this report. The possibility arose of an industry-wide agreement about the redevelopment of more in-depth training such as apprenticeships or traineeships. Community broadcasting could initiate this as soon as possible.

The report process has also revealed a funded opportunity for each of the stations to have a detailed training needs analysis through the Victorian state government's Skills for Growth program.

Attachment 1: Report Brief

From the SYN brief:

The community broadcasting sector is currently experiencing a widespread lack of radio transmission technologists, and SYN is an example of a station that is suffering critically due to low numbers of available qualified technologists in Melbourne.

At the 2008 CBAA Conference, the session that talked about attracting technologists was attended by over 30 delegates, which is just one indication of the general need for trained technologist input into stations.

For this reason, we have sourced funding from the Community Broadcasting Foundation to undertake the scoping and planning of a training pathway to qualify new technologists to work in our sector.

The overall aim of the project is to research potential accredited training pathways for new technologists, in order to make recommendations to the Melbourne community radio sector on the implementation of broadcast technologist training.

Objectives

The outcome of this project will be a comprehensive report offering information and recommendations to Melbourne community radio stations for the delivery (or co-delivery with relevant external organisations) of the Cert IV in Broadcast Technology.

The report will be made available to the national community broadcasting sector to inform other similar organisations of the recommended pathways to training and employing technologists.

SYN will oversee the consultancy on behalf of Melbourne community radio stations (support for the project has been given by Triple R, PBS FM, 3CR and JOY 94.9).

Consultant's Role

The consultant is required to provide services as follows:

1. Conduct widespread consultation with the following individuals/organisations:
 - a. Melbourne community radio stations (5)
 - b. Key training organizations

2. From the consultation process, determine the following:
 - a. What relevant resources for broadcast technology training are currently available and/or in use
 - b. The units of training that are required for people working in community radio organizations
 - c. Potential collaborations with RTOs to deliver this training (within and external to the community broadcasting sector)

3. Develop a comprehensive report that summarises the information gained via consultations, and offers a set of final recommendations and costings, based on the consultation process.

Attachment 2: Certificate IV in Broadcast Technology

CUF40307	Certificate IV in Broadcast Technology
Qualification Notes	
Descriptor This qualification reflects the role of individuals who use well-developed skills and a broad knowledge base in a wide variety of contexts in the television and radio broadcasting industries. They apply solutions to a defined range of unpredictable problems, and analyse and evaluate information from a variety of sources. They may provide leadership and guidance to others with some limited responsibility for the output of others.	
Job roles Job roles and titles vary across different industry sectors. Possible job titles relevant to this qualification include: <ul style="list-style-type: none">• Broadcast maintenance technician• Broadcast technologist• Master control operator (technical).	
Qualification pathways	
Prerequisites Units marked with an asterisk* have prerequisite units. RTOs offering direct entry into this qualification need to take these requirements into account when assessing candidates. Details of prerequisites can be found in the respective units.	
Pathways into the qualification Candidates may enter the qualification with qualifications or vocational experience in electronics or ICT.	
Licensing, legislative, regulatory and certification considerations There is no direct link between this qualification and licensing, legislative and/or regulatory requirements. However, where required, a unit of competency will specify relevant licensing, legislative and/or regulatory requirements that impact on the unit.	
Electrical work In some states and territories of Australia, a restricted electrical licence is required. Restricted electrical licences allow a person to carry out electrical work incidental to a trade. Incidental work may include fault-finding on equipment or changing like for like equipment by disconnecting and reconnecting the fixed wiring. It does not include any other changes to the fixed wiring.	
National Standard for Licensing Persons Performing High Risk Work The National Standard for Licensing Persons Performing High Risk Work applies to persons performing dogging and rigging work. Completion of the following units is required for certification at either basic, intermediate or advanced levels. CPCCLDG3001A Licence to perform dogging CPCCLRG3001A Licence to perform rigging basic level CPCCLRG3002A Licence to perform rigging intermediate level CPCCLRG4001A Licence to perform rigging advanced level.	
EME hazards RF workers are required to complete an Electro Magnetic Emissions (EME) Awareness course. In order to attend a site where there is substantial EME hazard (such as a broadcast transmission site) an understanding of the risks of EME and the necessary precautions to mitigate the risks is required.	
First aid The broadcast industry recommends completion of the St John Ambulance Senior First Aid course.	

Packaging Rules

Total number of units = 19

7 core units plus, 12 elective units. 9 elective units must be selected from the list below. The remaining **3** elective units may be selected from the elective units listed; the CUF07 Screen and Media Training Package or any other currently endorsed national Training Package. Elective units must be selected from a Certificate IV level qualification. Electives must be relevant to the work outcome, local industry requirements and the qualification level.

Core units

Broadcast technology

CUFBRT402A Maintain broadcast equipment and facilities

CUFBRT403A Ensure quality of broadcast output

ICT support

ICAI4030B Install software to networked computers

ICAT4221B Locate equipment, system and software faults

ICTTC102D Repair electronic faults

Industry context

CUFIND301A Work effectively in the screen and media industries

OHS

CUSOHS301A Follow occupational health and safety procedures

Elective units

Broadcast technology

CUFBRT401A Install or upgrade broadcast equipment and facilities

CUFBRT404A Coordinate outside broadcasts

Broadcasting

CUFBRD301A Perform basic transmission operations

CUFBRD303A Prepare video material for television transmission

CUFBRD401A Coordinate television transmission operations

Camera/cinematography

CUFCAM301A Shoot material for screen productions

CUFCAM402A Shoot television content in a multi-camera environment

CUFCAM403A Plan and implement installation of camera supports

Communication

BSBCM401A Make a presentation

Construction

CPCCOHS1001A Work safely in the construction industry

Electronics

ICTTC096D Conduct field tests of radio/wireless networks

ICTTC104D Maintain an electronic system

*UEENEEH026B Provide solutions to polyphase electronic power control problems

*UEENEEH042B Solve problems in oscillator sections of electronic apparatus

*UEENEEH043B Diagnose and rectify faults in digital subsystems of electronic controls

*UEENEEH044B Diagnose and rectify faults in analogue circuits and components in electronic control systems

*UEENEEH045B Develop solutions to analogue electronic problems

*UEENEEH049B Develop solutions to audio electronic problems

*UEENEEH072B Find and repair faults in communication systems

*UEENEEH073B Find and repair faults in professional audio reproduction components

*UEENEEH074B Find and repair faults in audio/video recording equipment

*UEENEEH077B Diagnose and rectify faults in recording and replay apparatus

*UEENEEH078B Diagnose and rectify faults in camera circuits

*UEENEEH080B Diagnose and rectify faults in digital transmission systems

First aid

HLTFA301B Apply first aid

HLTFA402B Apply advanced first aid

HLTFA403A Manage first aid in the workplace

Frontline management

BSBWOR402A Promote team effectiveness

General maintenance

UEEPOPS208B Operate local systems

UEEPOPS209B Perform process plant inspections

ICT building and implementation

*ICAI4029B Install network hardware to a network

*ICAI4097B Install and configure a network

*ICAI4175B Select and install a router

ICT support

*ICAS4109B Evaluate system status

ICAS4114B Implement maintenance procedures

*ICAS4127B Support system software

Industry context

CUFIND401A Provide services on a freelance basis

Lighting

CUFLGT301A Prepare, install and test lighting equipment

OHS

BSBOHS407A Monitor a safe workplace

Selecting electives for different outcomes

The context for this qualification varies, and this must guide the selection of elective units.

Examples of appropriate elective units for particular outcomes at this level follow.

Broadcast technologist

Core units plus:

- BSBWOR402A Promote team effectiveness
- CUFBRT401A Install or upgrade broadcast equipment and facilities
- CUFBRT404A Coordinate outside broadcasts
- *ICAI4097B Install and configure a network
- ICAS4114B Implement maintenance procedures
- *UEENEEH044B Diagnose and rectify faults in analogue circuits and components in electronic control systems
- *UEENEEH045B Develop solutions to analogue electronic problems
- *UEENEEH049B Develop solutions to audio electronic problems
- *UEENEEH072B Find and repair faults in the RF sections of electronic apparatus
- *UEENEEH074B Find and repair faults in audio/video recording equipment
- *UEENEEH080B Diagnose and rectify faults in digital transmission systems
- ICTTC104D Maintain an electronic system.

Master control operator (technical)

Core units plus:

- CUFBRD301A Perform basic transmission operations
- CUFBRD401A Coordinate television transmission operations
- CUFBRT404A Coordinate outside broadcasts
- BSBWOR402A Promote team effectiveness
- BSBOHS407A Monitor a safe workplace
- *ICAS4109B Evaluate system status
- ICAS4114B Implement maintenance procedures
- *ICAI4097B Install and configure a network
- *UEENEEH080B Diagnose and rectify faults in digital transmission systems
- ICTTC104D Maintain an electronic system
- HLTFA301B Apply first aid
- HLTFA402B Apply advanced first aid.

Broadcast maintenance technician

Core units plus:

- BSBWOR402A Promote team effectiveness
- ICTTC104D Maintain an electronic system
- ICTTC096D Conduct field tests of radio/wireless networks
- *ICAI4029B Install network hardware to a network
- *ICAI4097B Install and configure a network
- *ICAI4175B Select and install a router
- *UEENEEH072B Find and repair faults in the RF sections of electronic apparatus
- *UEENEEH073B Find and repair faults in professional audio reproduction components

- *UEENEEH074B Find and repair faults in audio/video recording equipment
- *UEENEEH077B Diagnose and rectify faults in recording and replay apparatus
- *UEENEEH078B Diagnose and rectify faults in camera circuits
- *UEENEEH080B Diagnose and rectify faults in digital transmission systems.

Attachment 3: Composite technologist job description/skills required for broadcast technical work mapped to qualification

Following communication with the five managers from the Melbourne stations which have commissioned this report, the following skills list has been drawn up.

Job role	Specific tasks and responsibilities
Perform basic transmission operations	<ul style="list-style-type: none"> Plan and advise on transmission resource needs Co-ordinate the maintenance and development of transmission chain needs, including transmitter, antennae and STL and other links Monitor quality of incoming and outgoing transmission Understanding of multiple technologies e.g. analogue, digital, ISDN, STL, antennae, podcasts, live streams etc Liaison/Negotiation with Site Lessors and Techs etc.
Ensure quality of broadcast output	<ul style="list-style-type: none"> Monitor and maintain quality of broadcast Rectify distortion problems
Locate IT equipment, system, network and software faults	<ul style="list-style-type: none"> Advise on systems update, and opportunities to improve/increase services Define the causes of the problem and create a plan of action Identify and report on system development options
Install or upgrade broadcast equipment and facilities	<ul style="list-style-type: none"> Great understanding of emerging technological developments/equipment, to keep the station abreast of these possibilities Prepare for installation of studio and other equipment Install or upgrade equipment Program equipment and systems Training of broadcasters in use of new equipment
Maintain broadcast equipment and facilities	<ul style="list-style-type: none"> Locate and repair faults in studio and other audio/visual equipment used in station production and broadcast Undertake routine maintenance Provide general technical support
Coordinate outside broadcasts	<ul style="list-style-type: none"> Prepare for OBs Co-ordinate technical operations during OB Finalise OB location operations
Work effectively in the screen and media industries	<ul style="list-style-type: none"> Communicate effectively with others Take responsibility for own personal development Participate in quality improvement activities Strong interest in emerging technologies

From this list, training consultant, Linda Marson has mapped the tasks to a Certificate IV in Broadcast Technology.

CUF40307 Certificate IV in Broadcast Technology

NOTES

- Units marked with an asterisk (*) have pre-requisites – the RTO delivering this qualification will need to check the parent Training Package for details of pre-requisite units.
- A broadcast tech person should check the content of the suggested electronics units to make sure they are appropriate. To an untrained eye they appear to be relevant.

Core units**Broadcast technology**

CUFBRT402A Maintain broadcast equipment and facilities

CUFBRT403A Ensure quality of broadcast output

ICT support

ICAI4030B Install software to networked computers

ICAT4221B Locate equipment, system and software faults

ICTTC102D Repair electronic faults

Industry context

CUFIND301A Work effectively in the screen and media industries

OHS

CUSOHS301A Follow occupational health and safety procedures

(Note: this unit is being introduced in v1.1 of CUF07 to be released shortly)

12 elective units**Broadcast technology**

CUFBRT401A Install or upgrade broadcast equipment and facilities

CUFBRT404A Coordinate outside broadcasts

Broadcasting

CUFBRD301A Perform basic transmission operations

Electronics

*UEENEEH072B Find and repair faults in the RF sections of electronic apparatus

This unit covers fault finding and repair of radio frequency sections in electronic apparatus. The unit encompasses safe working practices, interpreting circuit diagrams, applying logical fault finding procedures, conducting repairs, safety and functional testing and completing the necessary service documentation. (pre-req: UEENEEH046B Solve fundamental problems in electronic communications)

*UEENEEH073B Find and repair faults in professional audio reproduction components

This unit covers fault finding and repair of professional and high-end audio amplifiers, preamplifiers, receivers, graphic equalisers, speakers. It encompasses safe working practices, interpreting circuit diagrams, applying logical fault finding procedures, conducting repairs, safety and functional testing and completing the necessary service documentation. (pre-req: UEENEEH024B Carry out repairs in predictable faults in audio components)

*UEENEEH080B Diagnose and rectify faults in digital transmission systems

This unit covers fault finding and repair of faults in digital transmission systems. It encompasses safe working practices, interpreting diagrams, applying logical diagnostic methods and knowledge of digital transmission systems circuit components, rectifying faults, safety and functional testing and completing the necessary service documentation. (pre-req: UEENEEH076B Diagnose and rectify faults in display circuits)

ICT support

*ICAS4109B Evaluate system status (pre-req: ICAT3025B Run standard diagnostic tests)

ICAS4114B Implement maintenance procedures

*ICAS4127B Support system software (pre-req: ICAI3020B Install operating system software)

Training and workforce development

TAADEL403B Facilitate individual learning

BSBWOR404A Develop work priorities

Industry context

CUFIND401A Provide services on a freelance basis

Attachment 3a: Skill sets/short courses from CUF40307 Certificate IV in Broadcast Technology

The Screen and Media Training Package does not mandate particular pathways to the achievement of qualifications. It is the prerogative of RTOs to use the rules of the qualifications to provide the best learning programs and sequences to meet the needs of their students and customers.

Skill sets are defined as single units of competency, or combinations of units of competency from an endorsed Training Package, which link to a licence or regulatory requirement, or defined industry need. Skill sets are a way of publicly identifying logical groupings of units of competency which meet an identified need or industry outcome. Skill sets are not qualifications. Where skill sets are identified in a Training Package, the Statement of Attainment can set out the competencies a person has achieved in a way that is consistent and clear for employers and others.

Below are suggested skill sets of units within the 19 recommended units that provide short course delivery options. It should be noted that these skill sets have not been the subject of any industry consultation or endorsed in any way. They are only a suggested grouping that would provide competency outcomes for students and stations.

Broadcast Technology (Studio Maintenance)

Target group	This skill set is for people working in studio maintenance and development for community broadcasting stations, where there are technical supervision roles.	
Units	CUSOHS301A	Follow occupational health and safety procedures
	CUFIND301A	Work effectively in the screen and media industries
	CUFBRT401A	Install or upgrade broadcast equipment and facilities
	CUFBRT402A	Maintain broadcast equipment and facilities
	CUFBRT403A	Ensure quality of broadcast output
	CUFIND401A	Provide services on a freelance basis
	*UEENEEH073B	Find and repair faults in professional audio reproduction components
	* Units marked with an asterisk* have prerequisite units. Registered Training Organisations offering this skill set need to take these requirements into account when assessing candidates. Details of prerequisites can be found in the respective units in the parent Training Package.	
Pathway	These units of competency provide credit towards the following qualification (and other qualifications that allow for selection of the same units):	
	<ul style="list-style-type: none"> CUF40307 Certificate IV in Broadcast Technology. 	
Suggested form of words for Statement of Attainment	These units of competency meet industry requirements for studio maintenance work in community broadcasting stations.	

Broadcast Technology (Information and Communication Technology)


Target group	This skill set is for people working in information and communication technology areas of community broadcasting stations.	
Units	CUSOHS301A	Follow occupational health and safety procedures
	CUFIND301A	Work effectively in the screen and media industries
	ICAI4030B	Install software to networked computers
	ICAT4221B	Locate equipment, system and software faults
	ICTTC102D	Repair electronic faults
	*ICAS4109B	Evaluate system status
	ICAS4114B	Implement maintenance procedures
	*ICAS4127B	Support system software
	TADEL403B	Facilitate individual learning
	BSBWOR404A	Develop work priorities
	CUFIND401A	Provide services on a freelance basis

	* Units marked with an asterisk* have prerequisite units. Registered Training Organisations offering this skill set need to take these requirements into account when assessing candidates. Details of prerequisites can be found in the respective units in the parent Training Package.
Pathway	These units of competency provide credit towards the following qualifications (and other qualifications that allow for selection of the same units): <ul style="list-style-type: none"> • CUF40307 Certificate IV in Broadcast Technology • ICA40205 Certificate IV in Information Technology (Support).
Suggested form of words for Statement of Attainment	These units of competency meet industry requirements for information technology and communications work in community broadcasting stations.

Broadcast Technology (Transmission)

Target group	This skill set is for people working in transmission areas of community broadcasting stations	
Units	CUSOHS301A	Follow occupational health and safety procedures
	CUFIND301A	Work effectively in the screen and media industries
	CUFIND401A	Provide services on a freelance basis
	*UEENEEH072B	Find and repair faults in the RF sections of electronic apparatus
	*UEENEEH080B	Diagnose and rectify faults in digital transmission systems
	CUFBRD301A	Perform basic transmission operations
	CUFBRT404A	Coordinate outside broadcasts
	TAADEL403B	Facilitate individual learning
	BSBWOR404A	Develop work priorities
		* Units marked with an asterisk* have prerequisite units. Registered Training Organisations offering this skill set need to take these requirements into account when assessing candidates. Details of prerequisites can be found in the respective units in the parent Training Package.
Pathway	These units of competency provide credit towards the following qualification (and other qualifications that allow for selection of the same units): <ul style="list-style-type: none"> • CUF40307 Certificate IV in Broadcast Technology. 	
Suggested form of words for Statement of Attainment	These units of competency meet industry requirements for transmission work in community broadcasting stations.	

Attachment 4: Kordia Course brochure



broadcast solutions

KORDIA™ TRAINING A NEW OPPORTUNITY IN BROADCAST TRAINING

OUR EXPERIENCE IN TRAINING

At Kordia™, we believe in being experts in our field and providing a solid foundation for our broadcast technicians and engineers. After years of hands-on technical experience and training our own staff, we have established a strong knowledge base, across a wide spectrum of broadcast subject matters.

Kordia™ now offers training to external customers in courses highly sought after by the broadcast industry. These courses meet the current operating needs of the broadcast industry and are backed by our vast experience in this field, along with the skills and knowledge of Kordia™'s large network of highly qualified broadcast engineers.

LEARN FROM THE EXPERTS

Our courses are led by a team of full time accredited trainers, with a combined experience of more than 40 years in the broadcast and telecommunications industries. We will continue to invest in training resources and new courses to meet the changing needs of the industry.


All course participants will receive classroom theory instruction to establish basic principles, followed by hands-on practical sessions using the latest industry standard broadcast transmission equipment and test instruments. They will also receive a comprehensive set of course notes and relevant reference materials.

OUR COURSES

Kordia™ offers training in a variety of broadcast-specific courses, including

- AM/FM PoP Measurement
- Basic AM Transmission Principles
- Basic DTV Transmission Principles
- Basic FM Transmission Principles
- Basic PAL TV Transmission Principles
- DTTV Fault Finding 2
- DTTV PoP Measurement
- PAL TV PoP Measurement
- Power Systems
- Satellite Systems
- Valve Tx Maintenance
- Equipment Communications & Interfacing

Kordia™ can also tailor courses to your specific needs. We offer basic introductory courses to advanced courses.



www.kordiasolutions.com

Attachment 5: Scanditel Course brochure

SCANDITEL

Auckland and Canberra



PROPAGATION

SIGNALS & SYSTEMS

BASIC PROPAGATION THEORY

Course objective: To provide the knowledge you need to be able to estimate attenuation during line-of-sight conditions and when the radio wave propagates over well-defined obstacles of different types.

Prerequisite: Engineering degree or certificate.

The duration of this course module is two days.

<u>DATE</u>	<u>TIME</u>
Monday	9.00-16.00
Tuesday	8.45-16.00

PROPAGATION FOR RADIO-RELAY SYSTEMS

Course objective: To provide the basic knowledge you need to be able to design radio-relay systems and networks, and estimate performance of the systems.

Prerequisite: Basic propagation theory as defined above or equivalent knowledge.

<u>DATE</u>	<u>TIME</u>
Wednesday	8.45-16.00

PROPAGATION FOR MOBILE SYSTEMS

Course objective: To provide a basic understanding of propagation for cellular systems, cellular planning and network design. This includes methods to estimate attenuation, reasons for various types of fading and their countermeasures as well as methods for interference calculation in cellular networks.

Prerequisite: Basic propagation theory as defined above or equivalent knowledge.

The duration of this course module is two days.

<u>DATE</u>	<u>TIME</u>
Thursday	8.45-16.00
Friday	8.45-16.00

SIGNAL THEORY & AM/FM

Course objective: To show how pulse shape and spectrum relate to each other, and to provide an overview of analogue modulation techniques.

Prerequisite: Engineering degree or certificate.

<u>DATE</u>	<u>TIME</u>
Monday	9.00-16.00

DIGITAL COMMUNICATION

Course objective: To provide a basic understanding of A/D conversion, information theory, I-Q modulation, signal detection and bandwidth requirements.

Prerequisite: Engineering degree or certificate.

<u>DATE</u>	<u>TIME</u>
Tuesday	8.45-16.00

DIGITAL MODULATION

Course objective: To provide knowledge of digital modulation methods used for mobile, and radio-relay systems, broadcasting, and broadband wireless systems.

Prerequisite: Digital communication as defined above

<u>DATE</u>	<u>TIME</u>
Wednesday	8.45-16.00

DIGITAL CODING

Course objective: To provide a basic understanding of coding techniques used for digital systems.

Prerequisite: Digital modulation as above/equivalent.

<u>DATE</u>	<u>TIME</u>
Thursday	8.45-16.00

CDMA

Course objective: To provide knowledge of spread spectrum techniques with emphasis on mobile systems.

Prerequisite: Digital modulation as above/equivalent.

<u>DATE</u>	<u>TIME</u>
Friday	8.45-16.00

Attachment 6: Course outline: Diploma in Broadcast Technology - Central Perth TAFE

Title: GROUP 01 - Core Units

Description: Learners to complete all units listed below.

Units:

Number	National ID	Title
D0911	BSBOHS509A	Ensure a safe workplace
D0938	BSBPMG510A	Manage projects
D1137	CUFIND301A	Work effectively in the screen and media industries
D1139	CUFIND402A	Develop screen and media specialist expertise

GROUP 02 - Specialist Units

Title:

Description: Select 2 Specialist Units from the units listed for this qualification in the CUF07 TP. ****Below is an example****

Units:

Number	National ID	Title
D1080	CUFBRT401A	Install or upgrade broadcast equipment and facilities
D1081	CUFBRT402A	Maintain broadcast equipment and facilities
D1082	CUFBRT403A	Ensure quality of broadcast output
D1084	CUFBRT501A	Collaborate on the design of broadcasting facilities

GROUP 03 - Elective Units

Title:

Description: Select 4 Elective Units, with at least 2 from the Specialist and Elective units listed for this qualification in the CUF07 TP. ****Below is an example****

Units:

Number	National ID	Title
C3732	BSBMGT503A	Prepare budgets and financial plans
D0097	ICAD4217B	Create technical documentation
D0098	ICAD5092B	Update and document operational procedures
D0760	BSBINN502A	Build and sustain an innovative work environment
D1035	BSBWOR502A	Ensure team effectiveness
W6235	UEENEEH046A	Solve fundamental problems in electronic communications systems
W6237	UEENEEH048A	Design and develop advance digital systems

Attachment 7: Consultation List

Name	Position
Georgia Webster	Manager, SYN Media. Report supervisor
Adrian Basso	Station Manager, PBS-FM
Libby Jamieson	Station Manager, 3CR
Dave Houchin	Station Manager, 3RRR
Stephen Hahn	Station Manager, JOY-FM
Dan Vo	Acting Station Manager, JOY-FM
David Sice	Technical Consultant, CBAA
Greg Segal	Technician, GWS, community broadcasters, Melbourne
Bill Runting	Technician, Waratel, community broadcasters, Melbourne
Christian Burnat	Technician, RBE, community broadcasters, Sydney
Brian Nash	Technician, Justware, community broadcasters, Adelaide
Gavin Unsworth	Technician, Afghanistan, formerly community broadcasters, Brisbane
Mark Tilbrook	Technician, CAAMA, Alice Springs
David Wright	National Field Services Manager, Broadcast Australia
Jeff Dale	Training co-ordinator, Broadcast Australia
Graham Grepper	Head Trainer, Broadcast Australia
John Maizels	Chair, Media Industry Technologist Certification Ltd
Ian Gair	Broadcast Solutions, Kordia
Linda Marson	Training Consultant, IBSA
Ken Brand	Content Distribution Centre Supervisor ABC WA
Judy Hiscox	Assistant Manager National and Community Broadcasting, Department BCDE
Nicola Joseph	Manager, National Training Manager
Mike Scott	Manager, Triple A Training, Brisbane
Ian Stanistreet	CEO, Community Broadcasting Foundation
Elizabeth Scammell	HR Manager, Broadcast Australia
Lisa Millner	Trainer Qpix, Brisbane
David Zanich	Learning Portfolio Manager for Engineering, Central TAFE Perth
Genevieve, Wearne	CEO, VERVE
Dominic Schipano	National Executive Officer, Communications & information Technology Training
Danny Dutton	State Manager, TXAustralia, Victoria
Linda Chellew	Manager, Indigenous Remote Communications Association
Terry Shadforth	Former Field Officer, VicTec, Group Training
Tom Fritz	Skills Tech training, Brisbane
Tony Roberts	RMIT electrotechnology
Deborah Welch	Station Manager, Radio Adelaide, President CBAA
Chris Daly	Station Manager, 6FX, Wangki Yupunanupurru, Fitzroy Crossing
Attendees	Technorama, 2009. CBAA Technical conference
Steve Buckley	President AMARC
Nicola Scrancher	Training Co-ordinator, Training & Development, BBC