RESOURCE MATERIAL

PATHFINDER SPECIALIST AWARD

PUAOPE002

Operate Communication Systems and Equipment

Resource Material

April 2010

Resource material for the Pathfinder Specialist Award.

The Resource Material, Review Booklet and Assessment tools were produced by the Seventh-day Adventist Church Youth Ministries of the South Pacific Division (SPD). The original material was supplied by Colin Ottery. John Wells led in the reshaping and rewriting with the assistance of a number of other experienced leaders; an editorial team brought the task to completion. We wish to express our deepest thanks to them all.

Contents

Orientation

Welcome to the Resource Material for PUAOPE002 Operate Communication Systems and Equipment.

Purpose

This unit covers the knowledge and skills required to transmit and receive communications in routine and operational situations using the organisation's communication systems and equipment.

The Resource Material

The Resource Material contains the essential information to meet the competencies outlined for this unit. It should help you to:

- Gain a comprehensive understanding of communication systems and the essential related equipment.
- Understand the issues relating to applying the acquired knowledge and skills in the context of Pathfindering activities.
- Prepare for the PSA training/review/assessment program.

A basic Review Booklet has been developed for this unit. It contains a small number of worksheets that, once completed, provide evidence that you understand the material. The Review Booklet needs to be completed before the assessment and forms part of the requirements to gain competence in this unit.

Note: If you have any questions, please consult your District Director or your local Conference/Mission Youth Department.

What Additional Resources Do I Need?

- Access to a UHF radio.

What Do I Need to Bring for the Training/Review/Assessment Program?

- Resource material (if received beforehand).
- Review Booklet (completed, if required).
- Pencil/pen.
- Any other resources or equipment as specified by your Assessor.

How Will I Be Assessed?

At the Conference/Mission training/review/assessment program your competency will be assessed by one or more of the following methods:

- Written/oral questioning.
- Completed Review Booklet.
- Simulation activities.
- Project/assignment.
- Practical demonstration.

Reassessment Process

- You will be given the opportunity for reassessment if you are not found competent.
- There will be no limit to the number of opportunities for re-assessment.

Appeal Process

If you are not satisfied with your assessment you can:

- Discuss the issue with your Assessor.
- Discuss the issue with your District Director.
- Request the mediation of another Assessor.
- Report your concern to the Conference/Mission Youth Director.

Consistency in Performance

This unit must be assessed over two (2) different outdoor activity events where you have to use a radio. The training event may be counted as the 2nd activity.

Unit Outline

The Unit Outline below summarises the requirements (Elements) of this unit. Each Element requires completion of various tasks (Performance Criteria).

PUAOPE002	Operate Communication Systems and Equipment
OPS	Field Operations

DESCRIPTION: This unit has been developed for the Outdoor Recreation Industry Training Package. It has been adapted to meet the needs of activities conducted within the framework of the Adventist Youth Ministries. The material has been presented for delivery using the Competency Based Training (CBT) method.

This unit covers the competency to transmit and receive communications in routine and operational situations using the organisation's communication systems and equipment.

Element	Performance Criteria
1. Use communication systems and equipment.	1.1. Equipment is used and operated safely to support communications consistent with organisations policies and procedures. 1.2. Communication equipment and techniques are selected to best meet the task, context and needs of the situation. 1.3. The communication system is correctly utilised to facilitate transmission and reception. 1.4. Communication systems are operationally maintained according to organisation's policies and procedures.
2. Transmit and receive communications.	2.1. Information is transmitted concisely and clearly to facilitate accurate reception of the message in accordance with organisational policy and procedures. 2.2. Contact is acknowledged, communication is confirmed and actioned initiated. 2.3. Communication faults and deficiencies are reported according to organisation's policy and procedures. 2.4. Alternative communication strategies are employed according to organisational procedures to address identified faults and deficiencies in communication. 2.5. Communication is processed and recorded in accordance with organisation's policies and procedures.
3. Maintain communications equipment.	3.1. Fault finding techniques are applied and basic maintenance conducted according to organisational policies and procedures. 3.2. Faulty equipment is identified and noted for repair.

CHAPTER ONE: Use of Communication Systems and Equipment

Communication is important in the outdoors. Groups enjoy going camping, hiking, caving and other activities as a challenge away from their usual environment. They enjoy the fellowship and love getting away from civilization, without making adequate provision to communicate. This is fine as long as there is no emergency or reason to contact essential services, and that cannot be guaranteed. Communication systems do have a role in the safety of the group.

Communication is also important if groups are working together in an outdoor activity where they are separated by distance. It becomes more important as the groups move further apart or are isolated by natural sounds (a waterfall) or natural visual obstacles. Communication is essential if groups or individuals need to work together in an outdoor activity.

Communication Methods

We communicate by different methods. These include:

- Vocal = Normal Speech, Yelling, Calls such as 'hay bob' or 'co-ee'
- Computer Generated Speech
- Visual = Signalling such as waving arms, semaphore, flags or hand held mirrors, Computers, TV, DVD
- Written = Letters, notes, Published works, e mail, Newspapers etc
- Language = English or other spoken Languages, Morse Code, Machine Language, sign language, Braille.

Different Types of Communications

Distance and the environment we are trying to communicate in, place limitations on all of these methods. Other methods of communication are called for.

Different types of communication equipment include:

- Telephone = Land line, Satellite Phone, Mobile Phone, SMS, Fax Teletype, EPIRB, pagers.
- Computer = Internet, The world wide web, Email, Facebook.
- Video/DVD =Television, video conference, Internet, DVD's.
- Radio = UHF CB Radio, HF CB Radio, Marine Radio, Amateur.
- Radio, Community Service Radio, Commercial Radio.

There are a wide range of communication methods but not all of them are practical in the outdoors. The strengths and weaknesses are outlined in the table below.

Type	Specific	Strength in outdoors	Weakness in the Outdoors
Telephone	Landline, Fax, Teletype	• None.	• No access.

	Satellite Phone	• Will work anywhere. • Can send and receive messages. • Very clear communication.	• Size. • Weight. • Limited battery life. • Cost. • Must have clear visual to sky.
	Mobile phone	• Will work anywhere in range • Small and light • Can send and receive messages. • Very clear communication.	• Very limited range in wilderness areas. • Need to be on top of ridges.
	SMS, pagers	• As above.	• As above.
	EPIRB	• Designed to send emergency signal to a satellite or aircraft.	• Limited by weight. • Needs clear sky view. • No affirmation if message received.
Computer	Internet & Email	• Can function with mobile or Satellite phones.	• Restricted by limited range of mobile phone. • Limited by weight and size. • Limited by the battery.
Video/DVD	TV,	• Can function in areas that have a power source.	• Limited by weight and size.
	Video Conference	• May work if in range for a satellite phone.	• Limited by size of the phone.
Radio	UHF CB Radio	• Portable. • Easy to work. • Communicates well.	• Limited by line of sight. • Limited by distance. • Limited battery life.
	HF CB Radio	• Portable. • Easy to operate. • Communicates well Under the right atmospheric conditions can get long skip transmissions.	• Generally limited as for UHF CB. • Transmissions are not as clear as UHF CB. • Not as popular as UHF CB.

	Marine Radio	• Excellent for Marine locations.	• Only for marine region. • Requires a licence to operate.
	Amateur Radio	• Can be portable. • In amateur bands can run radios at much higher outputs. • Can sometimes get access to amateur repeaters. • Could use a lower power cross band repeater in a remote site.	• Operators must hold a licence that is obtained by taking an exam and paying an annual fee. • High wattage outputs need a good power supply.
	Radio Stations	• Base use only.	• Not portable. • Not designed for individual communication.

The best communication systems available in an emergency situation are:

- Satellite phone.
- EPIRB - The old models could indicate for certain that the signal had been received and that a response was underway. The new models have added these features.
- Mobile phone - Excellent when in range.

The best communication equipment available for two groups to communicate in the outdoors are:

- Satellite phone – able to communicate almost anywhere in the outdoors; limitation is the cost besides the size, weight and the fact it is powered by a battery; needs clear view of the sky - not useful in a cave, canyon or other such sites.
- Mobile phone if within range.
- UHF CB Radio – Useful in line of sight for a limited distance. Easy to operate.
- HF CB (27mHz) able to communicate in line of sight for a limited distance. Easy to operate. Not as popular due to noisy transmissions and higher cost for portable units.

The UHF CB radio is the one most commonly used in our organisation because:

- It is the cheapest for a volunteer group.
- It is easy to operate and maintain.
- It is used to keep contact between groups who are within a limited range of each other.
- Works in well with Pathfinder Expeditions and when having to communicate on abseiling or canoeing (when in waterproof bag) adventures.

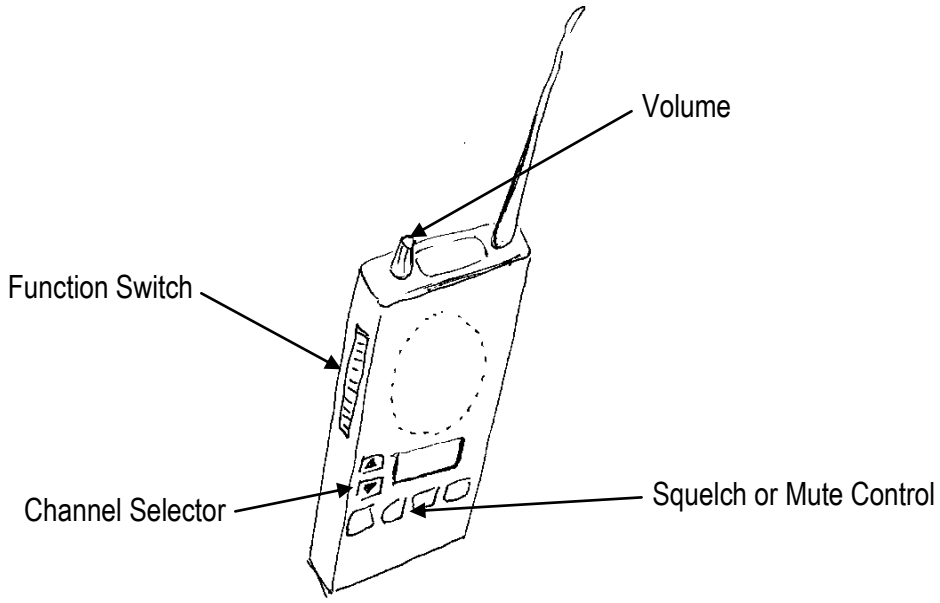
The UHF CB Radio (also known as handheld or walkie-talkie)

This is a hand-held portable radio transceiver. The first walkie-talkies were developed for military use during World War II. They were extended to public safety purposes and eventually to commercial and work site use after the war.

Major characteristics include a halt-duplex channel (only one radio transmits at a time, though any number can listen) and a push-to-talk switch that starts transmission. Typical walkie-talkies resemble a telephone handset, possible slightly larger, but still a single unit, with an antenna protruding on top.

A walkie-talkie's built-in speaker allows the user and those in the immediate vicinity to access the message being transmitted. Handheld transceivers may be used to communicate between individuals on the move; they can be vehicle-mounted or located at base stations.[1]

Parts of the Handheld Radio[2]



[1] http://wikipedia.org/wili/Walkie-talkie
[2] Drawn by J Wells

Functions of the Handheld Parts of a Radio

Function switch - This switch is usually on the side of the radio. It must be depressed completely during the whole time that the sender is speaking. Often a light comes on to indicate that it is operative.

Squelch or mute control - This control allows an operator to stop constant and annoying background noise from the receiver in the absence of an incoming signal. The correct setting is that which just suppresses the noise.

Channel selector - This enables the operator to select the channel that is being used by the group on the activity. Some handhelds have a feature that will lock the selected channel in place so that it won't be accidentally shifted.

Volume - This allows for adjustments for ease of hearing.

CHAPTER TWO: Operating a Radio Transmitter

The operating of a Handheld or walkie-talkie is the same as for any other radio communication. The standard procedure is practiced worldwide. That procedure is as follows:

- Listen first as to whether the frequency is already in use.
- Ask yourself if you are allowed to use the channel (frequency). (see notes below on Channel Allocation).
- Identify yourself to all others listening to the channel.
- Clearly name the person you want to communicate with. This needs to be done three times in succession then mention who you are. For example: Caller (alpha) **"Charlie, Charlie, Charlie this is alpha come in".**
- The receiver responds with their name and the fact they are receiving. Response is: **"Charlie receiving".**
- You can repeat the call three times if there is no initial response.
- Conversation is in short sentences that deal with the issues that need to be addressed. Do not engage the channel usage time with chatter.
- OVER – Over is mentioned at the end of each sentence.
- OUT – is mentioned when you completed your conversation. This indicates to the rest of the listeners that the channel is then free.
- If you are called and you are busy for some reason and cannot stop to respond then your quick response is: **"Charlie** (caller) **this is Alpha** (receiver) **stand by 5"** (or however many minutes it may be). Reply is – **"Charlie** (caller) **standing by, out"**. This means that the caller has got through and they can be on standby till the receiver is ready.

UHF CB Channel Allocation (476.425 MHz to 477.400MHz)

Channel	Use	Comments
5 and 35	Emergency use only Established by Law	Offence to use these channels unless for emergency purpose
11	Calling Established by Law	Call then switch to conversation channel

22 and 23	Data transmission only Established by Law	No voice transmission allowed on these channels
1 to 8 and 31 to 38	Repeater Established by Law	Operation in simplex mode on these channels is not permitted when within range of a repeater
40	Highway (convention)	Mainly truckies use
18	Caravans and Campers (confection)	Used when in convoy
10	4WD	Club, convoys etc
9, 12 to 17, 19 to 21, 24 to 30, 39	Chat Cannels	May be used for conversations

The International English Phonetic Alphabet[3]

Because we all speak in different ways that can easily cause "Tower of Babel" type confusion, the international radio operators have developed a special common "language" that practitioners can readily understand even when audio is not very clear. This is known as the English speaking Phonetic Alphabet; it is outlined below.

The table includes the pronunciation of figures which are expressed as single numbers:

Letter	Correct Phonetic Characters	Spoken As
A	Alfa	AL-fah
B	Bravo	BRAH-voh
C	Charlie	CHAR-lee
D	Delta	DELL-tah
E	Echo	ECK-oh
F	Foxtrot	FOKS-trot
G	Golf	GOLF
H	Hotel	Hoh-TELL
I	India	IN-dee-ah
J	Juliett	JEW-lee-ETT
K	Kilo	KEY-loh
L	Lima	LEE-MAH
M	Mike	MIKE
N	November	no VEM-ber
O	Oscar	OSS-cah
P	Papa	Pah-PAH
Q	Quebec	Kwee-BECK
R	Romeo	ROW-me-oh
S	Sierra	See-AIR-rah

Number	Correct Phonetic Characters	Spoken As
0	Zero	ZERO
1	One	WON
2	Two	TOO
3	Three	THUH-REE
4	Four	FO-WER
5	Five	FI-YIV
6	Six	SIX
7	Seven	SEVEN
8	Eight	AIT
9	Nine	NINER

[3] NT SES, Guide to Safety and Survival, p16

T	Tango	TANG-go
U	Uniform	YOU-nee-form
V	Victor	VIC-tah
W	Whisky	WISS-key
X	X-ray	ECKS-ray
Y	Yankee	YANG-key
Z	Zulu	ZOO-loo

(NOTE: Syllables in capital letters should be emphasised.)

The Phonetic Alphabet shown above is the internationally recognised way of sounding the letters and numerals spoken in the English language.

All numerals are stated as single digits except for multiples of hundreds and thousands. For example the number "124" is sounded as "WON, TOO, FO-WER" NOT "ONE HUNDRED AND TWENTY FOUR".

Other examples:

33.1	THUH-REE THUH-REE DAY-SEE-MAL WUN
80	AIT ZERO
156	WUN FI-YIV SIX
600	SIX HUNDRED

Radio Log

Radio log is a permanent written record of the calls sent and received using the radio. This is extremely important if the radio is being used during an event where the communication of precise information is crucial.

- When recording a sequence ot events as received.
- Must be done during a Search and Rescue operation (Actual or simulated).
- Reviewing a search and rescue simulation or actual event
- When coordinating an event such as a Pathfinder Expedition so that the review of events can be fully understood when debriefing.
- When documenting to the possibility of a group missing. Have a record of when and where they were last heard from.

The minimum records must include:

- The date and time of the radio communication.
- The channel used.

- The call sign or/and name of the other operator and all of the relevant communications from the parties.
    - Includes time, location and condition of the party.

CHAPTER THREE: Maintaining Communications

This chapter identifies methods of dealing with basic communication problems. It also provides information on storage and reviews the laws that affect the use of handheld radios.

Checking if a Radio Works

When testing a CB Radio to verify if it is in working order, these simple steps are recommended:

1. Check that all the control knobs are functioning and that there is no damage to the radio itself, to an attached microphone, external speaker or power cables.

2. Turn the radio on and check if any lights or screens light up (Never turn a radio on and transmit unless the aerial is connected).

3. Check the status of the battery in all hand held radios and ensure that spare batteries are all fully charged.

4. Turn the Squelch to the minimum, and turn the volume up to check for a signal or static. If there is static or another station's signal is registered, the Receive Circuit (Rx) is operational.

5. With the Rx operational, use the Push-To-Talk (PTT) button to call for a Radio Test to test the Transmit Circuit (Tx) by another operator.

6. Organise this test with another operator.

7. Another test with UHF CB only is to try to access a local known working repeater which will respond with a delayed carrier.

8. If other operators complain about the quality of the signal or if there is a problem in receiving other operators' signals, change the battery. If that does not work, put a marker on the radio and have it tested.

Guidelines for Using the Handheld Radio

1. Always keep the antenna vertical (the radio will transmit across longer distances if antenna is vertical).

2. Speak slowly and clearly.

3. Carry your radio with the battery disconnected when not in use. This will ensure longer battery life.

4. Keep batteries warm in temperatures below10'c to retain charge and to ensure they can release stored charge. If batteries are to be stored for a long time, it is best to store in the fridge.

5. Never trust your safety or that of your party solely to a radio or a phone.

Radios and Water

Water and radios do not mix, unless the units have been specifically designed for it (ie some ICOM models).

On a rainy day or if it is being used in a canoe activity, it is best to place them in a specifically designed water proof bag.

1. The bag is shaped for the radio and the aerial.

2. It is made in clear plastic so the channel and other dials can be read.

3. The dials can still be adjusted.

4. Communication is achievable through the waterproof covering.

Limitations of UHF Signals

A handheld Ultra High Frequency (UHF) radio relies on line of sight for sending a message. If there is physical obstacle in the way (such as a mountain), the signal will not be transmitted. The signal will likewise not be transmitted from one valley to another. One of the radios needs to be in a higher position for transmission to succeed.

The other limitation relates to Government regulation in the limitation of power in transmission. The 5 Watts power limit is weakened as it travels over land. The range for a small .5watt unit is only around 2kms while that of a 5watt is about 5 – 6kms.

When transmission does not occur properly move to higher ground or closer to the transmitter/receiver.

Repeater Stations

Activities such as Pathfinder Expeditions need coverage over the whole geographical area where the activity will take place. Often this includes black spots caused by ridges. An individual with a radio can act as a repeater station. They can respond to communications in the area that the base radio operator cannot access; the information can then be relayed to base. The range of communication can be extended by multiple human repeaters.

Repeater stations are established in different locations around Australia. Channels 1 – 8 are designated for them (including for the emergency Channel 5.)

How More Power can be Obtained for your Radio

It has already been noted that the handheld radio is limited by government regulation to 5watts. That can be improved on by the antenna that is used.

A 3db power gain at the antenna has the same effect as doubling the output power from the radio.

Eg: A 5w output from the radio through a 3db gain antenna is equivalent to using a 10w output.

A 5w output from the radio output through a 6db gain antenna is equivalent to using a 20w output.

A 5w output from the radio output through a 9db gain antenna is equivalent to using a 40w output.

The gain from an antenna is significant for the performance of the radio.

However, in some circumstances antenna gain can negatively impact on performance.

Expert consultation in the field is recommended to obtain best results within government guidelines.

Storage of Radios

1. Radios should be stored away from sunlight and extreme heat.
2. Removal of batteries from the unit is recommended for longer life.
3. Adequate storage assists in keeping track on the number of available radios.
4. It allows the identifying of missing units and facilitates the repairing of faulty ones
5. Storage must be readily accessible in the case of an emergency.

Preparing for Usage

1. Check that all of the radios are accounted for.
2. Check that all of the batteries are fully charged.
3. Log on radios that will be used.

Government Regulations[4]

Although no individual licence is required for CB in Australia, the use of CB is governed by a Class Licence and by the Act and Regulations. All of these provide for heavy penalties for the misuse of the band, including the confiscation of radio equipment where illegal equipment is used.

Commercial radio equipment can be used on the UHF CB band if it has been pre-programmed to comply with the CB Class Licence, such as power output and frequencies. UHF CB equipment is limited to 5W output maximum, although commercial sets are usually capable of 25W or more. If they have been set to operate at only 5W, they are legal to use on the CB band. Commercial equipment operating at a higher power or that is capable of being programmed from the front panel, is not approved for CB use. It is illegal to even possess one without a relevant licence.

Likewise, ownership of an Amateur Radio equipment capable of operating on the UHF or 27MHz CB bands is illegal without an Amateur (or Scientific) licence; unless it has been

[4] From ACNA. Resource material on Communications. p9 & 10

permanently modified to only operate on the CB channels and within the allowed power range. Amateur operators can use this equipment on CB bands as long as it is operated within the power limits for the relevant band.

Legal Penalty

In January 2007, the ACMA (Australian Communications and Media Authority) advised that the following penalties could apply for the misuse of CB channels.

For general misuse of legally allocated channels, or other practices in breach of the terms of the Class Licence, the operator can be prosecuted for "operating without a licence". This decision was based on The Radio communications Act 1992 which stipulates that if the provisions of a Class Licence are breached, operation under that Class Licence is no longer authorised. ACMA advise that such an offence carries the following penalties:

- for minor offences by individuals, an on-the-spot fine of $220; or
- for more serious offences by individuals, up to 2 years imprisonment; or
- in all other cases, up to $165,000 in fine.

Provision for these are made under section 46 of the Radio Communications Act.

For actual interference with an emergency call in progress (deliberate or accidental):

- an individual can face up to 5 years imprisonment; or
- $550,000 in fine.

This offence can only be dealt in court (section 193 of the Radio communications Act). The above was advised by the NSW Regional Office of the ACMA in January 2007.

Bibliography

Australian Emergency Manuals Series. Communications Manual 9. Second Edition, Commonwealth of Australia. Paragan Printers. Canberra. ACT Australia 1998.

Kerby, Mona. Samuel Morse. Franklin Watts. New York USA 1991.

Northern Territory Emergency Services. Guide to Safety and Survival. Western Media & Advertising Consultants Pty Ltd. Kingsley. WA. Australia. 1999.

Parker, Steve. Guglielmo Marconi. Chrysalis Children's Books. Malaysia 2003.

Reynolds, Vanessa. Bushwalking and Ski Touring Leadership. Brown Prior Anderson. Melbourne. VIC. Australia. 2000.

Appendix 1: Range Statements

The Range Statements provide advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. The Range Statements relate to the unit as a whole and helps facilitate holistic assessment. In addition, the following variables may be present for this particular unit of competency:

Range Statement	Categories
Communication equipment	may include • personal computers and modems • radio • facsimiles • signalling devices • mobile • landline and satellite telephones • pagers
Communications systems	may include • organisation's networks • communication protocols • verbal communication procedure • geographical information systems • relevant legislation such as Telecommunications Act
Verbal Communication procedures	may include • pro-words • phonetic alphabet • call signs • coded messages • use of abbreviations • emergency procedures
Voice procedures	may include • rhythm • speed • volume

	• pitch • sentences • correcting mistakes • repetitions
The sport and recreation industry	• covers industry sectors of community recreation, fitness, outdoor recreation and sport • significant roles played by activity organisations, industry peak bodies, professional organisations • large volunteer base • high turnover of volunteers • high levels of part time and casual employment • irregular working hours • relatively few professional positions • workforce employed mostly in operational positions • mainly small business or self-employed personnel • slow to take up technology • over 2/3 of the sport and recreation industry have no formal/recognised qualifications • significant reliance upon industry credentials and involvement in the activity itself

Appendix 2: Evidence Guide

The Evidence Guide identifies the critical aspects, knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the Range Statements.

Critical aspects of evidence	• Assessment must confirm sufficient knowledge to transmit and receive communications in routine and operational situations • Assessment of performance should be over a period of time covering all categories from the Range Statement applicable to the learner's work environment • In particular, assessment must confirm the ability to ♦ accurately transmit and receive communications using the organisation's communication system and equipment
Interdependent assessment of units	• This unit must be assessed after attainment of competency in the following unit(s) ♦ Nil • This unit must be assessed in conjunction with the following unit(s) ♦ Nil • For the purpose of integrated assessment, this unit may be assessed in conjunction with the following unit(s) ♦ Nil
Required knowledge and skills	• Required knowledge ♦ Range of communication equipment available to the organisation ♦ The organisation's communications system ♦ Organisational policy and procedures relevant to the operation of communication equipment • Required skills ♦ Utilise the organisation's communication processes and systems ♦ Use verbal communications procedures consistent with the organisation's communication system ♦ Clean and service communications equipment according to organisation's procedures ♦ Report communication faults and deficiencies according to organisational procedures
Resource implications	• Physical resources - assessment of this competency requires access to ♦ communications equipment ♦ appropriate documentation and resources normally used in the workplace • Human resources - assessment of this competency will require human resources consistent with those outlined in the Assessment Guidelines. That is, assessors (or persons within the assessment team) should ♦ be competent in this unit ♦ be current in their knowledge and understanding of the industry

	through provision of evidence of professional activity in the relevant area ♦ have attained the National Competency Standards for Assessment: BSZ401A, BSZ402A and BSZ403A
Consistency in performance	• Competence in this unit must be assessed over a period of time in order to ensure consistency of performance over the Range Statements and contexts applicable to the work environment
Context of assessment	• This unit of competency must be assessed in the context of sport and recreation activity. For valid and reliable assessment, the sport or recreation activity should be in an environment that closely replicates the workplace. The environment should be safe and free from complicated or non-routine hazards • This unit of competency should be assessed through the observation of processes and procedures, oral and/or written questioning on required knowledge and skills and consideration of required attitudes • Where performance is not directly observed and/or is required to be demonstrated over a "period of time" and/or in a "number of locations", any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons • Observation of the use of a range of communication equipment under non-operational and operational conditions or in a simulated environment

Appendix 3: Key Competencies

Key Competencies						
Collect, Analyse & Organise Information	Communicate Ideas & Information	Plan & Organise Activities	Work with Others & in Teams	Use Mathematical Ideas & Techniques	Solve Problems	Use Technology
2	2	2	1	1	1	2

These levels do not relate to the Australian Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

The three levels of performance (1, 2 and 3) denote the level of competency required to perform the task:

1. Use routine approaches
2. Select from routine approaches
3. Establish new approaches

Notes

Notes