



## **Appendix F – Report on communication issues**

**Brian Parry & Associates Pty Ltd, September 2003**





# Report on Communication Issues

Prepared by: -

*Brian Parry & Associates Pty Ltd*

For: -

*The House of Representatives*

*Select Committee into*

*Recent Australian Bushfires*

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## Glossary of Terms

<b>AFAC:</b>	Australasian Fire Authorities Council
<b>Closed User Group:</b>	A system utilising satellite telephones for direct contact with a designated group of other users
<b>Comcen:</b>	Communication Centre
<b>Command:</b>	The direction of resources in relation to one agency
<b>Control:</b>	The responsibility for overall management of an incident
<b>Duplex:</b>	A method of operation for communication between two radio stations in two directions simultaneously, utilising two radio frequencies
<b>EMA:</b>	Emergency Management Australia
<b>Fire Reporting System:</b>	A telephonic system enabling fire calls to be received simultaneously, at a number of locations utilising normal subscriber telephones
<b>GRN:</b>	Government Radio Network
<b>HF:</b>	High Frequency radio
<b>ICS:</b>	Incident Control System – a management structure which has been adopted universally by Australian firefighting agencies
<b>IMT:</b>	Incident Management Team – the group of management personnel that head the four functional areas within the Incident Control System (Incident Control, Operations, Planning & Logistics)
<b>ISHC:</b>	Interoperability Spectrum Harmonisation Committee
<b>Mobile unit:</b>	An authorised vehicle that is fitted with communications equipment
<b>Patching:</b>	The facility to link separate radio conversations utilising different radio channels
<b>PMR:</b>	Private Mobile Radio Network
<b>Repeater:</b>	Receiver / transmitter equipment for automatically relaying radio signals
<b>Simplex:</b>	A method of operation for communication between two radio stations in only one direction at a time utilising one frequency
<b>SMR:</b>	State Mobile Radio. This acronym also refers to 'trunked' radio within this report.
<b>Tactical:</b>	Decisions made at the fire front for the purpose of implementing the strategies set by the IMT
<b>Talkaround:</b>	A system used for fireground communications utilising low power output radios working through a repeater
<b>UHF:</b>	Ultra High Frequency radio
<b>UHF CB:</b>	Citizens Band Radio – dedicated 40 channels in UHF band
<b>Uncontrolled Network:</b>	A radio system which permits unsupervised conversation between stations on the network
<b>VHF:</b>	Very High Frequency radio



# 1. Executive Summary

On the 26<sup>th</sup> August, 2003 the “House of Representatives Select Committee on Recent Australian Bushfires” commissioned Brian Parry & Associates Pty Ltd to provide advice in relation to matters raised in submissions and in evidence to the Committee. The advice being sought was primarily in relation to rural fire brigade communications and interagency communications, including the action taken by individual brigades in developing informal systems to overcome perceived problems with agency systems.

The most notable bushfires during the past two seasons occurred in Victoria, New South Wales and the Australian Capital Territory. Because the major fire incidents were located in south eastern Australia, some would contend that the report is somewhat biased. Not surprisingly, most of the submissions and evidence placed before the Committee directly related to the perceptions that people formed before, during and after these fire incidents.

There is no guarantee that other states and territories would fare any better if fires of the same intensity had occurred within their respective jurisdictions.

Unfortunately, from these three jurisdictions, there was not a commitment to cooperate in regard to a review of the evidence that had been presented to the Committee. A similar attitude was adopted by the Australasian Fire Authorities Council. The cooperation of many member organisations on an agency basis was extremely helpful. They provided advice in general terms, but with obvious pride, about communication initiatives that they have, or are in the process of implementing, to ensure that the operational effectiveness of their fire services is not compromised by inadequate communications.



Many written submissions and hearing transcripts were read and further clarification of points was undertaken. Time restricted the number of face to face interviews and these were generally limited to groups that had made detailed submissions. Many of the concerns raised were supported by numerous other submissions on the same issues.

On preparing the report, a brief overview of the existing communication systems, used for non-urban firefighting, in each state has been provided. There is a growing tendency towards 'whole of government radio networks', and while these may suit many agencies, it could be contended that the time and current climate dictates, that on a national basis, emergency services must plan to work together, and closer. Communications across agencies is one of the major elements in establishing this cooperative climate. The report recommends that action be taken to develop a national radio system and the Australian Communications Authority has indicated support for such a proposal, subject to all states committing to the proposal. **(see recommendation 5 - page 22 )**

The member organisations of AFAC have committed to the management of incidents through the use of an 'Incident Control System'. Working within this system at multi agency incidents has tremendous benefits which have been touched on briefly within the report. The use of the system is further strengthened if the communications are planned to fit in with the management structure.

The communication systems that have been developed by the states and territories to ensure that adequate coverage is available for firefighters, utilises a diverse range of radio technology within a number of radio spectrums. A basic explanation of the characteristics of these frequency bands has been included in the



report, because matching the equipment to the geography of the area is critical to the performance of the network.

From the submissions and evidence presented to the inquiry, twelve major issues have been identified. These issues attracted numerous submissions and necessitated further investigation. While some of the issues raised were relevant to one incident or agency, it may also have relevance to how other agencies operate. Some recommendations have been provided where appropriate, based upon the available information.

- Issue 1. Dissatisfaction expressed **(page 26)**
- Issue 2. Support for the retention and use of UHF CB **(page 27)**
- Issue 3. Inadequate radio coverage during recent major events **(page 28)**
- Issue 4. Failure to achieve interoperability **(page 30)**
- Issue 5. Failure to accept local knowledge **(page 31)**
- Issue 6. Survivability of communication sites **(page 32)**
- Issue 7. Ground to air communications **(page 33)**
- Issue 8. Conveying fire information **(page 34)**
- Issue 9. Complaints about radio congestion **(page 36)**
- Issue 10. Use of scanners and listen only radios **(page 37)**
- Issue 11. Inadequate telephone coverage **(page 37)**
- Issue 12. Communications planning **(page 38)**

Other issues and innovations were also raised within the consultancy and were considered worthy of reporting as they do relate to communications. Very little was stated within the submissions or evidence to the Committee about data radio communications and the current use level, outside of the urban areas, seems to be minimal though, this could be an issue that needs to be considered in progressing the national communications concept.





Satellite telephones are now being used to a limited extent. This medium does hold potential though for an increasing range of applications for emergency service uses and does warrant further investigation.

The future direction of radio communications will probably be toward the use of 'Software Defined Radios'. The report provides a brief overview of this technology which is still under development. Many brigades, particularly in New South Wales, have queried the move to UHF communications which have resulted in a need for many repeaters to be set up. This equipment is proving to be expensive and still did not meet the operational needs during recent fires.

When submissions by the House of Representatives Select Committee were initially sought, the focus was clearly on 'direct' fire related matters. Throughout our investigations, however, much has been said about the ongoing cost of repeater site rentals. With some justification, brigades are querying why they pay for the use of the site and then appear to protect it from fire without cost to the site owner. These are usually located in the worst locations from a firefighter safety perspective.

Finally, the concept of a 'national emergency radio network' is outlined as an essential tool for natural disasters and other incidents that necessitate management under a national structure.

Many of the matters covered in the report caused a considerable amount of anxiety for people during, and after the fires. In many cases they are matters that can be fixed for the future without any significant injection of funds. Where there is a need for expenditure on radio equipment, it is extremely important that everyone works together to ensure that, further down the track, we can communicate with each other on an agency and national level. This ties in ultimately with the defence of Australia.



## 2. Project Overview

The House of Representatives appointed a Select Committee on the Recent Australian Bushfires to “identify measures that can be implemented by Governments, industry and the community to minimise the incidents of, and impact of bushfires on, life, property and the environment.”

The final public hearing by the Select Committee occurred in Canberra on Friday the 22<sup>nd</sup> of August, 2003.

The House of Representatives Select Committee commissioned Brian Parry & Associates Pty Ltd on 26th August, 2003 to provide advice in relation to communication matters raised in evidence to the Committee.

Specifically, the Committee requested that a brief be prepared on the communications systems generally in use within rural fire services within the states and territories, the problems and difficulties encountered in using these systems in major fire control operations, the communications systems used to coordinate fire fighting response from the various fire fighting and land management agencies within states, problems encountered with communications between agencies from different states and possible solutions to the problems identified. Of a more general nature, the report is to include information on the extent and use of informal systems that have been put in place by individual brigades or groups, to overcome perceived problems within agency systems. Based on the evidence previously received by the Committee, the report was to include advice on the practicality and benefits that may be gained by the introduction of a national radio network for use by the fire fighting authorities and land management agencies should they be required to operate interstate. By direction, the report is to include a general overview of the systems being used without providing a catalogue of



communication equipment, or the procedures used in rural fire fighting.

Initially, the submissions by various organisations and individuals and the transcript of the various hearings conducted by the Committee were evaluated. Subject to the content, and need for further clarification, direct contact was made with the relevant parties to obtain further supporting comment apropos the communications systems. Where considered relevant, technical advice was sought from other sources. This was particularly necessary because of the requirement to return the brief by the 26<sup>th</sup> September, 2003 to enable tabling within the House of Representatives by November 6<sup>th</sup> 2003.

### **3. Applied Methodology**

From the outset, it was evident that within the time constraints, it would not be possible for all of the respondents to be contacted personally in regard to communication issues. Within the transcript of the hearings and the written submissions there was a high level of commonality in the concerns that were raised.

Initially the written submissions were studied and the major communication issues were listed. Time did not allow for reading all of the submissions so there was a reliance upon a “keyword” scan carried out by the clerical staff supporting the House of Representatives Select Committee.

A similar process was then undertaken in regard to the evidence given verbally to the inquiry. This once again involved a study of the transcript from the hearings, assisted once again by the use of a “keyword” search of the various volumes of evidence.

With due regard to the objectives of the contract, a list of primary subjects was compiled for closer investigation. In compliance with



the brief some other issues, which were deemed to be relevant and important, were also listed for investigation and reporting.

Some face to face interviews were carried out in Melbourne, Sydney, and Canberra and on the south coast of New South Wales.

These interviews included meetings with some senior officers of emergency services and other organisations. Extensive consultation was carried out by telephone and further information was gleaned through use of the email system.

Support for the project was very good in the main, though it was disappointing that some government departments refused to provide any assistance. Other information was provided from personnel within the emergency services, private citizens and outside agencies, often with a request that they not be identified.

## **4. Overview of Existing Communication Systems**

### **4.1 South Australia**

A 'whole of government' approach to radio communications has been adopted and the government has insisted that all departments comply. The system recently chosen is using the UHF band and is not compatible with the fire services in adjoining states.

The fire service is allowed access to a limited number of channels. This is usually adequate for minor incidents but for any major incident that leads to overcrowding, local user advice is that it can cause a 'shut down'. Each station is fitted with a radio so that contact is maintained from there with the resources responded to the incident.

Representations were made to the Committee by the private forestry industry about the communications change within South Australia. Commercially, both Radiata Pine and Blue



Gums are cultivated in the area, and the growers, up until recently, were an integral part of the fire fighting effort. With the recent move to the GRN UHF system the fire fighting service has become isolated from the grower support.

The vehicles of the brigades adjacent to the Victorian and New South Wales borders carry a radio that can access the interstate local networks. Additionally, some of the vehicles are fitted with a UHF CB transceiver.

#### **4.2 Tasmania**

Rural fire fighting responsibility is shared in Tasmania, principally between the Tasmanian Fire Service and a combined administration of Forestry and National Parks. This complements the fire management role of local “Mac” teams (multi agency committee).

Communication throughout the state is achieved by using the 70 – 80 MHz portion of the radio spectrum, this being VHF low to mid band. The frequency range is ideal because of the mountainous terrain.

The fire service operates thirty repeater sites across the island state and this is complemented by a further 30 repeaters available through Forestry / National Parks, whose radio system is fully accessible through the fire service radio sets. The State Emergency Service and local councils are all working in this same radio band.

The normal working arrangement for the fire service radios is duplex, and at an incident, a simplex channel may be nominated for fireground communications between attending units. A command channel may also be nominated, if this is found to be desirable, at the incident.



Portable repeaters are available for deployment, should this be considered necessary, to overcome incident locality problems. There can be delays of an hour or more in having this equipment transported to a suitable location to overcome “black spots”.

It is unusual for Tasmania to send resources to another state during a major incident, except for personnel who can participate in the Incident Management Team. Nevertheless, Tasmania would support the concept of developing a communications system that would feature a block of frequencies for this purpose. Disparity of equipment may be negated by initialising a ‘back to back’ rebroadcasting facility. When necessary, this technology is already used to resolve local coverage problems.

Within the Midlands farming area, the fire appliances are equipped with UHF CB radio. This equipment is used extensively for communicating with the landholders. There is a level of dependence upon these people to back up the brigades, so coordination and control is achieved through the use of CB radio. In this way, the local communities are also kept apprised of the location and other information about fire events.

#### **4.3 Queensland**

The primary fire fighting authority throughout Queensland is Queensland Fire & Rescue Service. The service has two elements, urban for the major population centres and rural for the remainder of the state. The 1500 rural brigades are very well supported by the forestry and mining interests. There is also a very close working relationship maintained with the State Emergency Service and Councils.

The radio communications systems employed by the Service utilises both UHF and VHF. The urban services work through



a UHF system but throughout regional Queensland, the rural brigades are working in the 70 – 80 MHz VHF band with good results. This frequency range is well suited for working in the rougher terrain.

There are a number of communication centres established throughout the state. The Service has a very strong commitment to ensuring that whenever a vehicle is deployed, there will be a means of maintaining contact, with a preference for radio. When considered necessary, additional (portable) repeaters will be deployed, though it is accepted that there may be some delays in setting this equipment up. Cross patching (rebroadcasting) of radios that are on different systems is also achievable.

In keeping with the commitment of ensuring communications, the Service is currently constructing 3 mobile communication platforms which will be available for deployment across the State.

The vastness of the state dictates that there will always be some difficulty in providing complete radio coverage. In a development unlike any other fire service in Australia, in conjunction with a private telecommunications provider, a 'closed user group', utilising satellite telephones, is being introduced. For an annual fee this will provide unlimited satellite telephone use for the Service throughout Queensland. The plan is that each vehicle will eventually carry this equipment with a terminal in each Communications Centre. (Further details are provided elsewhere in this report.)

Queensland Fire & Rescue Service has not opted for involvement in trunked radio or a form of government radio network. Such a system is currently under consideration, but as a service, in the interest of national interoperability, the



view is that the Commonwealth should dictate the protocols for all government or trunked radio networks to ensure compatibility. This is not achievable at present.

Fireground (tactical) communications are achieved by the use of either VHF, or more commonly, through the use of UHF radios. The vehicles do have dual fit radios and channels that are available for this use, that are also accessible for other agencies.

Cross state border communications with New South Wales are achieved by the Queensland appliances carrying a NSW radio in any areas where interoperability is considered necessary.

All rural vehicles carry and use UHF CB. This provides access to a very big network of people and is considered really important, particularly for the Class 1 rural brigades. From time to time, deliberate interference is experienced through this medium, but generally speaking, discipline is good. It is almost vital for providing warnings to the rural population and as a line of communication for coordinating the assistance of the farming community during any incident.

The Service has recognised that with the directions that they have taken, “technology without training is dangerous”. With radios now available that can access up to 1,000 channels, there is the possibility in a tight situation for a radio user to become excited and choose an incorrect channel. In so far as possible, the technology is being kept simple and the accent is upon training for such situations.

#### **4.4 Australian Capital Territory**

The firefighting responsibility for rural fires in the Australian Capital Territory rests with the ACT Fire Brigade in the built up areas, and





with the ACT Bushfire & Emergency Services for the remainder of the Territory. Various land managers have responsibility for carrying out preventative works, but the responsibility for bushfire fighting outside of the built up area rests with the Chief Fire Control Officer.

The Bush Fire & Emergency Service has a radio system that consists of 4 main VHF duplex operational channels and UHF is used at command level. The primary operational channel is located at Mt Tennant and this is a solar powered base. The UHF channel is capable of transmission through this site and another at the northern end of the ACT.

The Bush Fire & Emergency Service channels are controlled from the Emergency Services Bureau complex in Canberra. From that location, radio communications are maintained with Forests, Cityscape, ACT Parks & Conservation and the ACT Fire Brigade Channels. When necessary, direct communication is available to NSW Ambulance, NSW Fire Brigades and Yarrolumla Council. The Comcen, by 'patching', can link users operating on different frequencies.

There is a current proposal for a major upgrade of the communications network available to the Bush Fire & Emergency Service. As part of the upgrade, interoperability is to be a major consideration for not just the agencies working within the Australian Capital Territory, but also for those with adjoining responsibilities, and with other agencies across Australia if a consensus can be obtained nationally on how this could be implemented.

#### **4.5 Western Australia**

The responsibility for rural fire fighting in Western Australia is shared between the Department of Conservation and Land Management (DCLM), the Fire and Emergency Services Authority



(FESA) and the Bush Fire Brigades, dependant upon the location of the incident. The bush fire brigades are formed and operate under the local council. The three services work very well together, sharing the access to 100 channels within the VHF spectrum.

The services fully utilise access to each others' repeater sites.

The Fire and Emergency Services Authority operates both an urban and a rural service. Every effort is made to ensure that there is at least two, if not three modes of communication available to each brigade responding to an incident. The primary mode of radio communication for rural incidents is via VHF, and in some areas this is enhanced through a satellite telephone system. The fire service also provides a command channel with direct communication back to the Comcen. In this way many of the inter-operative issues are overcome.

There is also a very effective HF radio system which is also supported by satellite phone provisions.

Although it is not an "approved" system, many of the 'farmer brigades' use UHF CB radio to stay in touch with each other and the land owners, during fire fighting operations. With or without approval, the UHF CB system is an important fall back measure should other communications fail.

Fire fighting resources, because of the distances involved, tend to only participate in providing assistance on an intra-state basis so national interoperability is not considered to be a problem.

#### **4.6 New South Wales**

In New South Wales, government departments, authorities and instrumentalities operate a total of 42 separate radio networks, and not surprisingly, even though amongst that total there is a



'Government Radio Network' (GRN), a whole of government radio system is under consideration.

Initially the government radio network did not have the capacity to cope with major incidents. This was recognised by the Police when the system was first proposed, and even though the coverage has improved, they still have not migrated to that system. The main users are the State Emergency Service, NSW Ambulance, NSW Fire Brigades and to a lesser extent, the NSW Rural Fire Service.

The responsibility for fire suppression throughout country New South Wales, is in the first instance, largely determined by the tenure of the land. State Forests and the National Parks and Wildlife Service, though basically land managers for specific purposes, have a responsibility for the control of fire on their respective estates. The NSW Fire Brigades provide fire protection throughout the more populated cities and towns state-wide, including the bush or grasslands around and within the urban fringe.

The NSW Rural Fire Service is the primary fire suppression service throughout country New South Wales, providing protection for most of the rural holdings, crown land, and any other land that is not included in the state forests or national parks aggregations. Each of these services has its own communications system and whilst interoperability is achieved on a local area basis, as a whole, this is not the case.

The NSW Fire Brigades, for communications throughout the state, utilise the GRN in all areas covered by the service footprint. Outside of this the primary line of communication is by a UHF PMR system. In some of the more remote areas, back up communications are provided by the use of satellite telephones. This is particularly important because of the state-wide Hazmat



responsibilities of the Service. Interoperability at fireground level is generally by local arrangement. In some cases this is achieved by a capability to switch channels to a rural fire service PMR service, while in other cases, the NSW Fire Brigade appliance has the capability of speaking at the fire front through the RFS fireground VHF system. Where there is a commitment to work together, the brigade personnel from both services will make some arrangement to ensure communications.

Both the National Parks & Wildlife Service and State Forests operate independent radio communication networks utilising the VHF band. On a local basis, there are some arrangements made for accessing each other's channels but this does not seem to be coordinated at a state level. Both services have not migrated to the GRN because most of their respective estates fall outside of the GRN footprint.

The NSW RFS moved from the VHF band as the primary line of communication when the GRN was introduced in 1995. Operationally the system was not capable of carrying the amount of traffic generated during a major incident, so it became necessary for private mobile radios (PMR) to be introduced on a district basis in the UHF band, whilst still retaining access to the GRN. While the change to UHF PMR has been reasonably successful in the Sydney, Newcastle, Wollongong area and west of the Great Dividing Range, there are still significant problems being experienced in utilising this band for communications in the mountainous areas. To assist in overcoming the problems on a district basis, the older VHF system may have been retained, UHF CB systems have been developed, or backup communication is achieved through working through the other agency's networks. At a command level where discreet or extended communications are required, extensive use is being made of the mobile telephone system. (The cost of mobile telephone calls are frequently an



impost on brigade finances, contributing to the need for constant fundraising.)

Some districts use the low power output VHF system developed by the RFS for fireground communications, and to a limited extent, interoperability. The decision has recently been taken to provide these radios without the 'talkaround' facility which has a slightly higher power output. The immediate reaction from the brigades is a concern that this limits the effectiveness of this mode of communication where the terrain is hilly and heavily vegetated.

For those brigades that do not have access to the RFS VHF fireground system, the UHF CB network has been extensively used for fireground communication, with particular emphasis on interoperability.

#### **4.7 Victoria**

The entire metropolitan area of Melbourne is serviced for both structural and bushfires by the Metropolitan Fire & Emergency Services Board. The primary means of communication is by UHF radio. The remainder of the state receives urban and rural fire protection from the Country Fire Authority or the Department of Sustainability and Environment. Most of the fire fighting on the freehold rural land is carried out by the CFA and the VHF band is used extensively for this purpose.

In rural Victoria for smaller incidents, the communication network is operated from the home of the Group Communications Officer (sub-bases) initially, and depending upon the severity of the situation, it may escalate to being oversighted at group level. Usually a fire station is the group headquarters. More serious incidents would see the communications being controlled from one of the permanently staffed stations.



The callout of the brigades, up until now, has been by the use of pagers or a telephone (fire) reporting system. The CFA was involved with Telstra back in the 1970's in producing the first "Fire Reporting System" and fire services across Australia have since benefited from that technology and subsequent refinements.

The use of 'listening sets' has also contributed to the efficiency of brigade callouts over the years, and even though they are not officially recognised by the Service, they help maintain the interest and morale of many firefighters as well as their families.

Changes to the communication system will soon occur with the introduction of a new Country Call Centre facility at Ballarat. This will negate the need for the sub-bases, and they will be phased out. This is change that is inevitable because the technology now enables the communications to be more centralised and with the socio-economic influences on volunteer's time, while it may not suit everyone it will suit the majority of volunteers that currently fulfil the onerous 'Communications Officer' role.

Victoria is also well served by the State-wide Mobile Radio Network (SMR). The system was developed by the Victorian Government in conjunction with Motorola and is managed by Telstra. It was widely used originally by various utilities such as gas and water, and it is still widely used by the Department of Sustainability and Environment (DSE), and to a lesser extent by the CFA. It is through the SMR that interoperability is achieved during fire fighting operations.

The VHF radio fitted to the CFA and DSE vehicles incorporates the SMR facility which can be activated by the use of a switch. This then allows the operator to dial the identified number on the microphone hand piece for whatever unit or base is required. As a general rule each appliance carries two radios so that one can remain on the operational channel whilst the other uses the SMR facility.



There are numerous VHF channels available to the CFA on a state-wide basis, and each region has its own primary operational channel. Should it be necessary, because of the amount of radio traffic resulting from a number of smaller incidents, or due to the complexity of operational traffic, additional channels can be made available. Similarly, separate channels can be organised by the CFA for brigade use between units on the fireground.

Many of the CFA vehicles and stations have UHF CB radios installed. These sets have been purchased by individual brigades and are now accepted by the Service, provided that they are not used for command or control communications. The brigades respect the direction that has been set and use them for internal brigade business, including; ensuring that their families are kept apprised of the brigade's commitments.

Brigades in the more remote areas are now being provided with satellite telephones. The introduction of this technology overcomes many of the safety concerns of the brigades that are less fortunate in the availability of communication options.

#### **4.8 Northern Territory**

The Northern Territory Police, Fire & Emergency Services have adopted a whole of government policy for communications and the indications are that it works extremely well. The radio communications primarily involve the use of UHF and HF, coupled with satellite services, to overcome the distances that the agencies need to work across.

In each of the major population centres, 'Comcens' have been established and any 'outage' at one location can be reasonably well covered from elsewhere to ensure that the communications support to the personnel in the field can be continued. For operational purposes, most of the information is carried by voice



communication, but within the system there is adequate capability for the transfer of data.

Interoperability problems on a territory basis are minimised because all of the services are co-located and controlled through the main control room in Darwin. The concept of a national communications system though, holds a high level of appeal because the Territory is vulnerable to major natural disasters and incidents, including the geographic proximity to the south East Asian region.

## 5. Interoperability

Interoperability describes the ability of different agencies to effectively communicate operational information from one agency to one or more other agencies, usually (but not exclusively) by radio.

Within this report, interoperability is further defined as being 'tactical' when referring to communications at the fire front, 'command' when the communication is at senior agency field officer / fire control centre level, with the further scope for interoperability at a 'strategic' level for incidents on a state or national basis.

Australia must work toward developing a National Strategic Radio System whereby, in any major incident, agency commanders and their respective communication centres can achieve full community interoperability.

### **Recommendation 1**

*That the Commonwealth, State and Territory Governments commit to the development, in conjunction with representative bodies of all emergency services, to a National Strategic Radio System as an essential element in the protection of Australia.*





## 6. Relationship of ICS to Communications

Throughout Australia, most of the emergency services and land management agencies directly involved in fire suppression have opted for the use of an 'Incident Control System'. By doing this, it has enhanced the interoperability of trained staff for situations where assistance is required during major incidents from other services, both intra-state and inter-state.

The benefits of utilising ICS includes; a widely recognised chain of command and assignment of responsibilities, standard terminology and systems for controlling personnel and equipment resources at any critical incident. It is also a means of ensuring that the workload is manageable to all of those who are working, both within the management structure and in the field. This is achieved by the introduction of span of control mechanisms based upon research through numerous major incidents.

While the ICS structure is to a large extent 'standardised', it is flexible in its implementation in that it can be scaled up or down as dictated by the incident.

The ease of implementation of ICS is enhanced by the experience gained in having personnel from numerous agencies deployed to incidents, both within and external to their own organisation and geographic area.

Just as ICS is flexible, it is essential that the communications systems involving all elements of the incident management structure are easily adaptable to the situation. There does need to be a basic communications framework that meets the requirement of the four functional areas of the incident control system, (these being control, operations, planning & logistics) as part of the planning process of any of the combat authorities. This will include

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planning for the use of various radio networks that will be available during the incident, with due regard to the ability for transfer of operational information at both fireground and command level.

## 7. Radio Propagation Characteristics

Within this report the radio bands that have been mentioned include HF (high frequency), VHF (very high frequency) and UHF (ultra high frequency). It is important that the difference between these bands, and in particular the characteristics that apply to each of these is understood. Each has its application and maximum effectiveness is not going to be gained by trying to operate a radio system in a band that does not suit the local conditions and cannot achieve an acceptable level of performance.

Basically, the higher the frequency the more direct the radio waves will travel between a transmitter and a receiver. In a basic short distance transmission between two radio sets across level ground, ultra high frequency (UHF) would be ideal. In this band, and under these conditions, an optimal level of performance would probably be achievable. Other performance limiting characteristics for UHF transmissions are; heavy vegetation, thick smoke and heat. UHF networks are highly acclaimed for their clarity of signal on a 'day to day' basis. In a bushfire situation, vegetation, smoke and heat are all present and can drastically reduce the performance of the network.

Over the same distance, but with a couple of hills or mountains in between, a performance level of good quality may be achievable by the use of radio repeaters on high points, that enable the signal to be carried, still virtually as a 'line of sight' transmission, albeit that it is diverting through one or more repeaters.

Close to the same level of performance may be available by use of a radio in the very high frequency (VHF) range, because in this band, there is a higher degree of curvature of the radio signal than



there is when using UHF. VHF signals can also be influenced by vegetation, smoke and heat but to a lesser degree than UHF.

Both VHF and UHF emit a signal that is referred to as a 'ground wave' because of the characteristic of tending to follow the curvature of the earth. VHF mid band, from an operational perspective, is preferred by firefighters for working in difficult terrain.

Some reference has also been made to the use of high frequency (HF), primarily in some of the larger states. HF has a capability of emitting either a 'ground wave' signal or a 'sky wave' signal. The type of signal tends to vary according to the type of antenna that is used. When the objective is to achieve a 'ground wave', it can be anticipated that, dependent upon the power output, the signal may travel further than most VHF signals. The bigger advantage though, in these situations, is that it is capable of working around obstacles more so than VHF, and markedly so, by comparison with UHF. The other type of signal (skywave) that can be generated by a HF radio relies upon the signal travelling skyward up to the ionosphere from where it is reflected back to earth. This enables the signal to travel much greater distances across the earth's surface.

Traditionally, HF radio has been a very noisy band within which to work, but supporting communications equipment has now advanced to the point where some exceptionally good results are being achieved, especially when the HF radio spectrum is used in conjunction with satellite communications.

Though this is a simplistic overview of radio wave propagation, this should highlight the operational constraints that needs to be considered when selecting radio equipment for distribution to the emergency services. Technology does allow for equipment, in the various radio bands, to work in harmony and utilise the advantages



of each. In such situations, regard must still be given to the known characteristics of each band.

## 8. Issues from Submissions & Evidence

The following list of issues have been summarised on a priority basis. The list has been compiled according to the number of times that it was raised for presentation to the House Representatives Select Committee on the Recent Australian Bushfires. This cannot, however, be construed as necessarily indicating the importance of each issue, as in many cases there is a high probability that people would not have raised particular concerns that they knew had already been mentioned by other respondents.

It is also important to note at this juncture that as the title of the Committee included 'Recent Australian Bushfires', input from states that had not had major fires in the past few years was of course significantly less than the input relative to the fires during the immediate past 2 seasons in New South Wales, Victoria, ACT, and to a lesser extent, Western Australia.

### Issue 1

Dissatisfaction expressed that all agencies involved in an operation could not communicate on the one radio network at a command level;

### Background

Throughout the written submissions, and in evidence, numerous people made reference to the lack of understanding in objectives and roles of the various agencies at major fire incidents. In some ways, the greater the number of agencies involved, the more the problem was exacerbated. Many of the comments originated from people outside of the emergency service organisations, but clearly with a vested interest and understandable concern for their own property.

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This clearly is a planning issue and it became evident during the consultancy that the development of an 'Incident Action Plan' is not always supported by the preparation of a 'Communications Plan'. The planning process in fact should be considered well in advance of the incident, with due regard for the means of communication available throughout the area.

Even with the development of a communications plan, in many cases the incident management team would require that interoperability be achieved by communicating back through the incident management team and liaison officers at the appropriate communications centre. Where this is the case, it does place a heavy onus of responsibility on the members of the incident management team to ensure that operational communications of this nature are handled expeditiously. If this is not achievable then clearly some other arrangement, by way of access to a common radio channel, is required.

In identifying communications at this level as being 'command', strictly speaking, this level of communications is striving to achieve coordination between divisions as well as involved agencies.

### **Recommendations 2 & 3**

- a. That through the state and territory agencies a greater emphasis be placed on pre-incident and incident preparation of communication plans as a means of ensuring effective interoperability between agencies at command and tactical levels.*
- b. That the speed of transfer of operational information between agencies at command level be regularly monitored to ensure that operational objectives are not being compromised.*

### **Issue 2**



Support for the retention and use of UHF CB radios throughout the fire services;

### **Background**

In previous years some fire services have actively set out to discourage brigades from the use of CB radio, principally when CB radio was operated in the 27 MHz range. For rural fire fighting, the attitude has now changed with some services encouraging the installation of the equipment, while others are condoning its use for other than operational communications.

Via the submissions, transcript of evidence and subsequent inquiries, it is evident that on numerous occasions during the last season, UHF CB proved to be invaluable to brigades when they found that they had lost all other means of communication. The service was also used for the initial reporting of fires, reports on the progress of fires and in particular the proximity to assets, tactical communication between the vehicles and personnel working at the fire front. It proved to be critical as a means of alerting the community to the situation by either direct communication or use of the facility by landholders as a listening device. Clearly, at this point in time, this is the only nationally available radio system that has wide-spread access and acceptability.

The people that are speaking in strong support of this means of communication are well aware of the risks associated with the use of an 'uncontrolled' network and its susceptibility to abuse. The defence that is provided, is that they have experienced very little deliberate interference and that through local planning, and with access to 40 channels, procedures are in place to overcome such problems. The use of the network by vehicle mounted radios and handheld units has wide acceptance in most states for the essential 'chatter' channel at the fire edge, more so than any other recognised and dedicated radio system for this fireground



application. With such wide-spread use within the fire services and rural landholders throughout Australia, the system is achieving interoperability at a very practical level.

The use of this equipment for this purpose should continue.

#### **Recommendation 4**

*That the use of UHF CB between units on the fireground be included in communications planning for intra-state and interstate deployments.*

#### **Issue 3**

Inadequate radio coverage during recent major events;

#### **Background**

Many of the major fires in recent times have been fought in very steep and heavily vegetated terrain. Wide spread comment has been received about people from different services standing side by side, with some achieving good communications, while others found their service poor or inaccessible. There are a number of factors that would influence such differentiation in performance but fairly consistently, it seems that communication was achievable by use of VHF radio in difficult country while UHF services failed. (reference is made elsewhere in this report about the advantages / disadvantages of radio communications in the various bands). The forced migration of fire services to the use of UHF radio systems in mountainous terrain has in itself become a major occupational health and safety issue. No radio system though, can guarantee 100% coverage; hence the need for a back-up communication system at all times.

Some emergency services have made huge financial commitments to developing high performance UHF networks, installing numerous repeaters at accessible high points, still without achieving complete coverage of their respective areas. For such situations, further financial commitment has then been required to



overcome the black spots by introducing satellite phones or some other technological solution.

Some form of radio communication is achievable virtually anywhere these days, but basically the network needs to be based upon the development of a system that best suits the terrain within which it primarily is required to work. Minor exceptions can be handled through various methods, by which apparatus in varying wave bands can be linked to form an integral network. Such systems can become daunting for casual users, a concern raised by some of the fire services operational staff.

In designing any radio network for use within the emergency services, there must be due consideration given to the arduous circumstances under which the equipment and operator may be required to work. The system needs to be kept as simple as possible and there needs to be adequate training to ensure that in stressful circumstances, the failure of the communications system is not attributable to operator error.

#### **Recommendation 5**

*That state and territory agencies review on a district basis, the suitability of the current allocated radio spectrum to ensure that as far as possible, firefighter safety is not being compromised through inadequate communications.*

#### **Issue 4**

Failure to achieve interoperability via communications at fireground level;

#### **Background**

This issue has already been touched upon in Issue 2, where UHF CB radio is used extensively for communication at this level. Some agencies do have dedicated UHF and VHF systems specifically for this purpose, utilising low power transmissions, that





can in some cases achieve enhanced performance by use of the 'talk around' channels. Elsewhere throughout Australia, and as part of the communications planning, a specific channel on the main network will be nominated by the communications centre for tactical chatter at the fireground level. The disparity between fire services and other agencies involved in firefighting is so wide that it is difficult to see how the problem could be overcome within the short term. This has become a 'day to day' issue within some states, whilst others are quite comfortable with the arrangements that they have in place.

Given the increase in recent years of the number of occasions when assistance is moved from state to state, there is a need for commonality in those situations and this can most efficiently be achieved at this time by the utilisation of the UHF CB network. In the longer term, use of this system may prove to be impractical.

#### **Recommendations 6 & 7**

- a. That as a short term objective, the use of '40' channel UHF CB equipment be adopted for coordination and interoperability of communications at fireground level.*
- b. That as a longer term objective a national communications plan be developed and incorporate the provision of low powered VHF channel allocations for the purpose of ensuring compatible fireground communications between all agencies on a national basis.*

#### **Issue 5**

Failure to accept local knowledge during firefighting operations;

#### **Background**



This subject presented numerous times throughout the submissions and evidence provided to the Committee. It was also raised as part of the investigation and is addressed here on the basis that so many people considered it to be a communications failure.

Without doubt, in many communities there is a wealth of local knowledge that can be of benefit during major fire fighting operations. Many of the people with this knowledge have previously worked in a paid or voluntary capacity within one of the many agencies or authorities involved in the firefighting effort. The advice that they can provide is valuable, but the level of value needs to be ascertained prior to the onset of an incident. The incident management team, during an incident, is not going to be in a position to carry out an assessment of the value of the advice that such individuals can contribute.

Once again this is a matter that needs to be addressed as part of the planning process. The evaluation of the person's knowledge could be provided through the agency with which there was a previous association.

There are also difficulties associated with involving people during the incident who may have been away from the firefighting scene for an extended period of time. As with everything else, in firefighting, there is a continual change process involving communications, equipment, occupational health and safety issues and management accountability, to name but a few. While not all change sits comfortably with everyone, it is expected that change does in some way improve the system.

On the other hand, with the changes that have been implemented and in particular, the introduction of ICS, there is a tendency for decisions to be made without due regard to fire history, land use, known fire paths and fire behaviour. It is a challenge for an incident management team to bring all this together, and clearly



without regard for local knowledge, many have failed in some of the severe incidents of the last few years.

There is a need for local knowledge to be considered within the planning process. It is not clear though, how this information should be communicated. Perhaps through community briefings.

### **Recommendation 8**

*That through state and local organisations with operational planning responsibilities, consideration be given to means by which local knowledge could better be utilised during fire fighting operations.*

### **Issue 6**

Survivability of communications sites during major bushfires;

### **Background**

Recent fires in mountainous and heavily vegetated areas have rendered a number of communication sites unserviceable for prolonged periods of time. Mobile telephone towers, two way radio transmitter and repeater sites, commercial radio and television installations have all suffered losses to valuable equipment and 'down time' from their normal operations. In some situations the fire has caused loss of power to the site and the situation has then been further exacerbated when 'stand-by' batteries have been exhausted or 'stand-by' generators have run out of fuel.

The firefighting effort can be totally frustrated by the loss of these communication systems. The lives of fire fighters may also be placed at considerable risk where there is a reliance on the performance of this equipment for fire fighting communications.

The situation of losing communications is a major occupational health and safety concern for fire fighters. It can and does lead to further loss of assets to the fire. These situations should be avoidable because in most cases, the fuel levels could be



controlled by either burning or mechanical means without major environmental degradation of the area. Common sense needs to prevail!

### **Recommendation 9**

*That the Federal Government, in conjunction with the respective State and Territory Governments, issue the necessary directives to ensure that the survivability of essential communication installations during fire incidents is ensured by strategic fuel management around the assets.*

### **Issue 7**

Ground to air communications at the fire front;

### **Background**

During the submissions, and to a lesser extent through the evidence presented to the Committee, fire fighters complained of not having direct communications from the fireground to the air support resources engaged in water bombing or reconnaissance work. Some agencies that normally have access to their own air resources can maintain communications from the fireground to the aircraft, but as a general rule the practice is frowned upon. During water bombing operations an 'Air Attack Supervisor' would normally direct the aircraft to the target in compliance with the request from the 'Air Operations Manager'. The air operations manager within the ICS structure is working in conjunction with the 'Operations Officer', and it is totally inadvisable for air resources to be prioritised or directed from any other location once the management structure is up and running.

The cause for concern is justifiable and directly relates to a failure of the incident management or handling of radio traffic within the communications centre. This is a critical area for the safety of ground crews and poor performance of the responsible personnel should not be tolerated by the incident management team. The



answer though, is to fix the problem rather than change a system that will also create problems.

The performance of the air operations team is a critical area for audit by the 'Safety Officer'. If the level of support to the fireground is inadequate then steps need to be taken immediately to correct this anomaly.

### **Recommendations 10 & 11**

- a. *That the management of air operations continue as described within the current ICS management structure with variation only permitted under exceptional circumstances.*
- b. *That state and territory agencies be alerted to the concerns raised to the Committee indicating communication difficulties in regard to communicating operational information from the fire front to aircraft.*

### **Issue 8**

Conveying fire information to the local community;

### **Background**

Throughout the written submissions to the Committee and to a lesser degree through the evidence, concern was raised about the need for better briefings to be available to the local community on the location of the fire and the actions being taken to limit the spread and protect the community. Through the interview process a number of people actually commented on how well they were kept informed. Obviously, at some incidents, the information flow to the community and firefighters was much better than it was at others. It is an important communication issue that, when well handled, can provide huge benefits to the IMT.



There can be little doubt that where the initiative was taken in providing scheduled briefings at a nominated location for local residents, it was well appreciated. People who felt that their property was directly under threat were reluctant to attend these briefings and indication are that in a number of such situations, a short briefing was provided utilising the wide spread availability of the UHF CB network throughout the rural areas.

It has been difficult to ascertain within the communications consultancy how detailed local media releases from the communications centre actually were, or if they were being prepared on a more global basis for distribution. It is pleasing that within the written submissions, special mention was made of the excellent service provided by a regional ABC radio station in keeping the listening audience informed of fire developments, largely on a scheduled basis.

Insufficient information was made available for any further comment or recommendation in regard to keeping the community informed. Suffice to say that in some areas, the performance was somewhat unsatisfactory.

### **Issue 9**

Complaints about radio congestion at both fireground and command level;

### **Background**

Complaints in regard to this matter were not relevant to all states and territories. It would seem as though this is a matter that is well managed during most incidents by the development of an effective communications plan. It is clear that at fireground level, on some recent incidents, there were too many users for the available channels. At this level the systems do not operate as a controlled net and with so many people involved in a property protection role,



many calls needed to be repeated when time and radio traffic permitted. The people who normally handle the radio, of necessity, became involved in other tasks. This then impacted upon the radio system.

At a command level and trying to cope with an asset protection role, there was an obvious need for further diversification of channels. These radios operate as a controlled net, hence each call from a mobile requires a response from the control operator. This can mean that if 60 mobiles are operating on the one network then the average transmission time can be as low as 30 seconds per hour, per vehicle. This further reinforces the need for interoperability communications to be relayed through the Comcen, rather than introduce other agencies onto the main operational fire channels. It also highlights the need for communication training on protocols and operating procedures.

Planning of communication networks, including that required for additional resources moving into the area, must be documented and promulgated well ahead of the incident. Senior field officers need to have some input into this planning process and to be aware of the communications structure proposed for various scenarios.

#### **Recommendation 12**

*That at state and territory level, all organisations ensure that district communication plans have regard for the amount of radio traffic that may be generated under the most severe conditions.*

#### **Issue 10**

Use of scanners and 'listen only' radios;

#### **Background**

Some firefighters, their families and members of the general public, have for some time, used this sort of apparatus as a means of being aware of call outs, requests for additional crews, the



locations of fires and other operational issues. The use of this type of equipment has been condoned in some areas and encouraged in others but through information provided to the Committee, this information source was not as effective during the last season. Through the Committee, requests were made for the local operating channel information to be made available, even published, so that the practice could continue into the future.

Insufficient information has been forthcoming to permit any further comment or recommendation in regard to this matter.

### **Issue 11**

Inadequate telephone infrastructure in bushfire prone areas;

#### **Background**

The recent bushfires have caused major disruption to power distribution throughout the areas. Within 8 hours of the power being lost, telephone communications failed. This is because there is usually an 8 hour battery back up capability and if power has not been restored in this time, telephone services shut down. It does seem that this meets the Telstra customer service delivery standard but it is totally inadequate in the face of a major fire or some other form of disaster. It seems as though the problem is common to both the mobile telephone network and the standard telephone system.

Management of emergency incidents involve numerous agencies, not all of which have access to a two way radio system. To be able to function effectively these agencies need telephonic communication.

Through the investigation, advice was provided that very few telephone or mobile phone facilities now have automatic generators to cope with power outages, with full reliance now on the 8 hour battery back up. Further advice is that if the power is





expected to be out longer than the 8 hours, then a contractor is required to deliver an emergency generator to the site to facilitate the resumption of telephone service. The events of the past fire season have proven this system to be totally inadequate.

### **Recommendation 13**

*That the Federal Government be requested to investigate, and where necessary, enhance the provision of emergency power for the purpose of restoring telephone and mobile telephone services or expeditiously in areas affected by fire or other natural disaster.*

### **Issue 12**

Communications planning;

#### **Background**

This matter was not raised openly in either the submissions or evidence placed before the Committee. It did become evident though, during the investigation phase, that very few of the people that commented on communication issues had actually seen a documented 'communications plan'. Some agencies do have written plans, perhaps the best example of which is that produced by the Department of Conservation and Land Management in Western Australia. **(See Annexure 1.)**

This framework, in conjunction with other relevant information, should be included within a standing 'Operations Plan'. The planning of communication for future incidents should be undertaken on a collaborative basis involving all of the agencies likely to be involved in any future fire incident. In this way, each agency has a degree of ownership in the plan. Once developed, the plan needs to be tested and regularly reviewed to ensure that it remains current.

It is from this standing 'Operations Plan' that the basic operational communication framework (similar to Annexure 1) is downloaded



and modified to meet the operational needs of any particular incident.

Unless the basic framework is developed well ahead of the incident, time will be lost or a communications plan will not be promulgated to the people involved at the various levels of the suppression effort.

The communications plan, at each level, must meet the operational needs; hence it is inadvisable that preparation of the plan be left for development by technical staff without input from operational personnel.

With some jurisdictions not providing input to the Inquiry or subsequent investigation of matters raised, it is difficult to determine the extent of the communication planning problems. Suffice to say that at some incidents, communication planning has been far from satisfactory.

#### **Recommendation 14**

*That state and territory agencies ensure that on a district basis, communications are addressed within the District Operations Plan with a capability of easy adoption to the Incident Action Plan for a particular incident.*

## **9. Alternative Communication Methods**

### **9.1 Data Radio Communications**

Up until this point in time, the use of data transmitted by radio within the non-urban fire services has been very limited and as such, is on the periphery of this brief.

The current development of a Digital Radio System utilising a Motorola system named "Smartzone" is probably the way forward for data, paging and vehicle location systems. This seems to be the path being taken by the Northern Territory Police, Fire &



Emergency Services though it is unclear to what extent this will benefit bushfire fighting.

Previous attempts by other emergency services to utilise data and voice transmissions across one radio network have not proven to be satisfactory. Invariably these services have resorted to a dual radio fit to ensure satisfactory results.

It is anticipated that with the rapid improvement in technology directed toward the provision of data services, major advances will be achieved within the next few years, probably justifying a 'hasten slowly approach' to this medium. Most of the technology is being directed toward 'Narrowband Data' and with refinement, this has the potential to fulfil all of the desired data and messaging requirements of rural fire services. The scope for service delivery will be enhanced even further if all agencies work cooperatively to ensure standardisation and compatibility of equipment.

It is believed that the Australasian Fire Authorities Council is in the process of developing a national position in regard to radio interoperability. If this is the case, then it would be advisable for the future of data radio transmission for fire services to be incorporated within any resulting policy.

#### **Recommendation 15**

*That the Australasian Fire Authorities Council be requested to determine protocols and standards on a national basis for the adoption and implementation of mobile data services by all firefighting agencies with a view to ensuring national compatibility.*

#### **9.2 Satellite Telephones**

Some state and territory fire services are using satellite phones as a means of improving other communication mediums. Probably the best example of this is where satellite phones are being used



in conjunction with HF communications in remote and difficult areas. The common perspective still seems to be that they are bulky, difficult to use and expensive. Technology has improved for the first two points and the cost of purchasing and utilising this as a communications system is becoming more cost effective, depending upon the type of application for which it is intended for use.

The Queensland Fire & Rescue Service is currently involved, in conjunction with Optus, in developing a 'closed user group' utilising satellite telephony. As part of the project, an annual subscription has been negotiated which will cover unlimited use by all of the QFRS units.

The intention is that a terminal will be installed in each communications centre with a mobile terminal facility also being available for field deployment. A dome antenna will be fitted on the vehicles and usage of the system is primarily expected to be for strategic command communications. The initial cost of purchasing and installing the satellite phone units in each vehicle will prove to be quite expensive, but the introduction of the system virtually guarantees communication to all units, wherever they are deployed. This represents a major safety initiative for firefighters.

Since the introduction of a national radio system is probably still some years away, as an interim measure at command level, consideration should be given to the installation of satellite phones for key agency personnel within their vehicles with terminal equipment being installed in each agency head office at state level. This could be developed as a 'closed user group' network on an Australia-wide basis, ensuring interoperability on a short term basis at least.

Projected technological development of third and fourth generation mobile telephones is also not that far away and it is anticipated



that through the CDMA network, these telephones may be able to offer similar features to the satellite telephone 'closed user group' technology.

#### **Recommendation 16**

*That the Australasian Fire Authorities Council be requested to consider the development of a 'closed user group', utilising satellite telephony, as an interim measure for achieving interoperability between member agencies on a national level.*

#### **9.3 'Software Defined' Radio**

This is a totally new concept in radio communications which is currently being developed by the United States Military. The introduction of this type of technology could revolutionise the two-way radio industry because, regardless of the operating band, and using computerised software, this type of radio will automatically align to a base station. This would mean that there is no need for a spectrum to be allocated for the use of these radios. This type of technology *may* be available in 5 to 8 years time.

## **10. Associated Costs of Radio Networks**

### **10.1 Establishment Costs**

Numerous brigades spoke of the enormous amount of funding that is being consumed in developing and maintaining communication networks for firefighting. They do understand the need for reliable communication systems, but quite a few expressed a concern that not all changes bring about an improvement in communications.

In particular, within New South Wales, with the high 'fail' rate of UHF primary networks in difficult terrain during the recent fires, it is not surprising that the basis for the move to the UHF band is being widely criticised when other agencies were not required to make the move from VHF. As such, when working alongside personnel from land management agencies that are still working within the



VHF band, the deficiencies of the UHF system become very obvious.

It would be wrong to assume by these comments that the system is unsatisfactory right throughout the state. There was some very positive comment received about the performance of the network west of the Dividing Range and within the Sydney, Newcastle, Wollongong area. While there is always going to be a 'fringe' area, it is important to not divide a district in the provision of radio coverage.

It is not known if similar problems are being experienced elsewhere.

#### **Recommendations 17 & 18**

- a) *That consideration is given to enhancing the performance of the UHF PMR network within NSW to overcome local performance deficiencies where UHF is considered to be the appropriate band.*
- b) *That through areas of difficult terrain within NSW, where UHF PMR performance is sub-standard, consideration be given to the re-introduction of a VHF system as the primary network, preferably in the mid-band spectrum.*

#### **10.2 Repeater Sites**

In order to gain reasonable performance from a UHF radio network operating in mountainous country, it is essential that there be a number of repeaters introduced to assist in moving the signal through the steep terrain. Many of the repeater sites are controlled by other agencies who contribute very little to the firefighting effort (in NSW alone, these agencies include but are not limited to, National Parks & Wildlife Service, State Forests, NSW Police, Transgrid & other electricity authorities, Telstra & other communication carriers, Snowy Mountains Hydro Electricity



Authority, Sydney Catchment Authority, Civil Aviation etc.) including the protection of their own assets. These agencies, in addition to achieving their fire protection at the expense of the volunteer service, are then charging the firefighting services exorbitant rental to have the repeater equipment installed at the sites that the agencies control. This has been identified as being totally inequitable by brigade personnel who asked that the House of Representatives Select Committee into the Recent Australian Bushfires be made aware of the situation in the hope that a more equitable solution will be forthcoming.

### **Recommendation 19**

*That nationally, for the purpose of communications for the Police, Ambulance and Fire Brigades, any rental costs associated with the use of radio sites under the care, control or management of Federal, State, Territory or Local Government be waived, other than for the ongoing cost associated with the use of power at the site.*

## **11. National Emergency Channel**

It seems as though there is an accepted point of view across all of the emergency service organisations, Australia-wide, that there is a need for radio frequencies to be set aside as a means of ensuring interoperability between the various states and agencies. This need was first identified back in 1974 after Cyclone Tracey, and the Australian Communications Authority (ACA) issued a block of 64 channels to fulfil this purpose. The combined Police forces of Australia took control of all 64 channels and this situation remains unchanged. Currently the Police, on a national basis, have identified a need once again for channels where they can communicate between services and with other emergency service organisations, but it seems highly unlikely that they will surrender all or any of the 64 channels that previously had been set aside for this very purpose.

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In discussions with the ACA, it was indicated that whilst this is a very complex issue, the ACA is sympathetic to the need for interoperability at a senior level and on a nation wide basis.

At the behest of the NSW Government, representatives of the States and Territories gathered a few years ago and established the “Inter-government Spectrum Harmonisation Committee” (ISHC). This Committee has met 6 times, and collectively, there is a spirit and willingness to cooperate in the development of a national strategic radio network. Outside of the meetings though, the objective is quickly lost as demonstrated by the current situation with both the NSW and Victorian Governments currently procuring totally incompatible equipment within the same radio band. This is the same culture and behaviour that has prevailed since the allocation of the 64 frequencies back in 1974.

It seems as though the states and territories are being driven by the need for short term fixes for current problems. If the national approach is ever going to succeed, then the states and territories will need to adopt a long term approach to the matter.

The fact that radio equipment is being purchased to work within a designated radio band does not in any way guarantee interoperability with other users within that same band. The technology as it exists at this time, through different suppliers, is totally different and incompatible with that of other manufacturers. Whilst it may appear to be a restrictive trade practice, to achieve the desired outcome of a national radio network, all of the radio hardware will need to be purchased from the one manufacturer and virtually at the same time. The procurement cycle must be synchronised.

Given the current world situation, it is quite conceivable within the next 10 years or so, a natural disaster or some other incident may





necessitate the deployment of emergency service personnel and equipment to the extremities of mainland Australia. In such a situation it would be extremely beneficial, if not essential, for the national radio system to be operational at command level across many agencies. For this to be achievable, the move needs to be made now by way of irreversible commitment by the states, territory and federal governments to plan and procure the necessary infrastructure and hardware.

If such a radio system is to be developed then it will be essential that one organisation fulfils the coordination role. Most agencies and many individuals would contend that this coordination role should be adopted by Emergency Management Australia, which already has a coordination role in the handling of natural disasters and other incidents including providing the interface with the Australian Defence Forces. Indications are that Emergency Management Australia does not see this as part of its charter, hence there may be a need for some review of the current legislation to secure involvement of that organisation in this process.

Debriefings after a number of recent world-wide incidents have identified the failure to provide a fully interoperable communication system across agencies as being a limiting factor in the management of these incidents.

#### **Recommendations 20 & 21**

- a. That the Commonwealth, in cooperation with the State and Territory Governments, give serious consideration to adopting a national radio communications network.*
- b. That the coordination of the deliberations be assigned to Emergency Management Australia.*



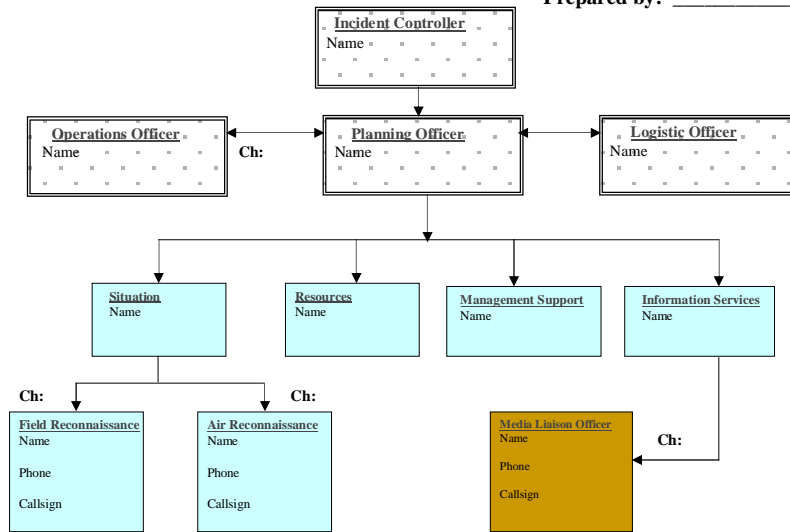
**The following Diagrams have been reproduced courtesy of the  
Department of Conservation & Land Management, Western Australia.**

**Annexure 1.**



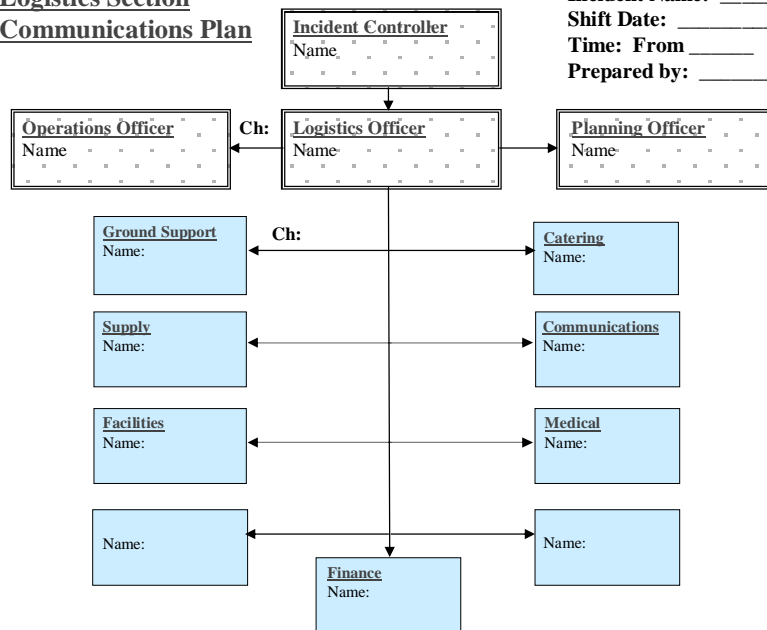
**Planning Section  
Communications Plan**

**Incident Name:** \_\_\_\_\_  
**Shift Date:** \_\_\_\_\_  
**Time: From** \_\_\_\_\_ **to** \_\_\_\_\_  
**Prepared by:** \_\_\_\_\_



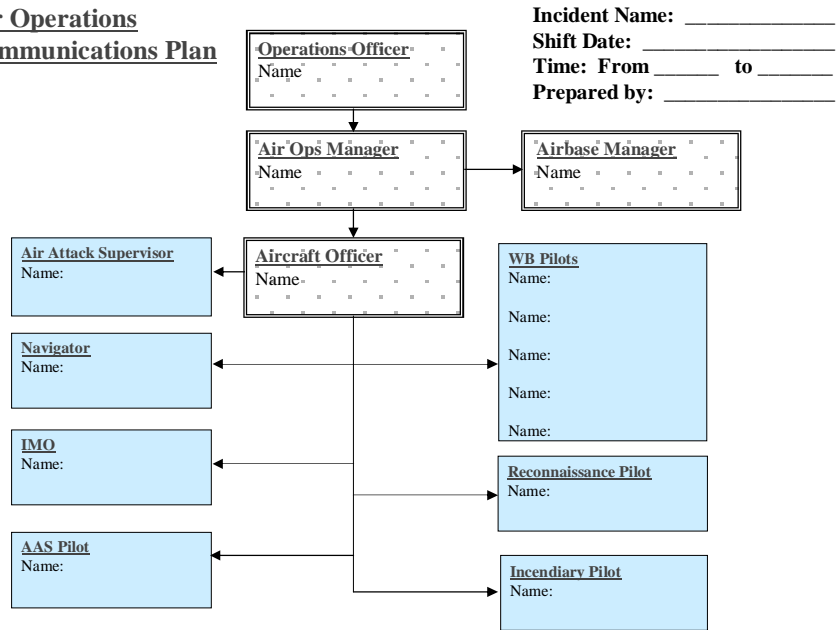
**Logistics Section  
Communications Plan**

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**Shift Date:** \_\_\_\_\_  
**Time: From** \_\_\_\_\_ **to** \_\_\_\_\_  
**Prepared by:** \_\_\_\_\_

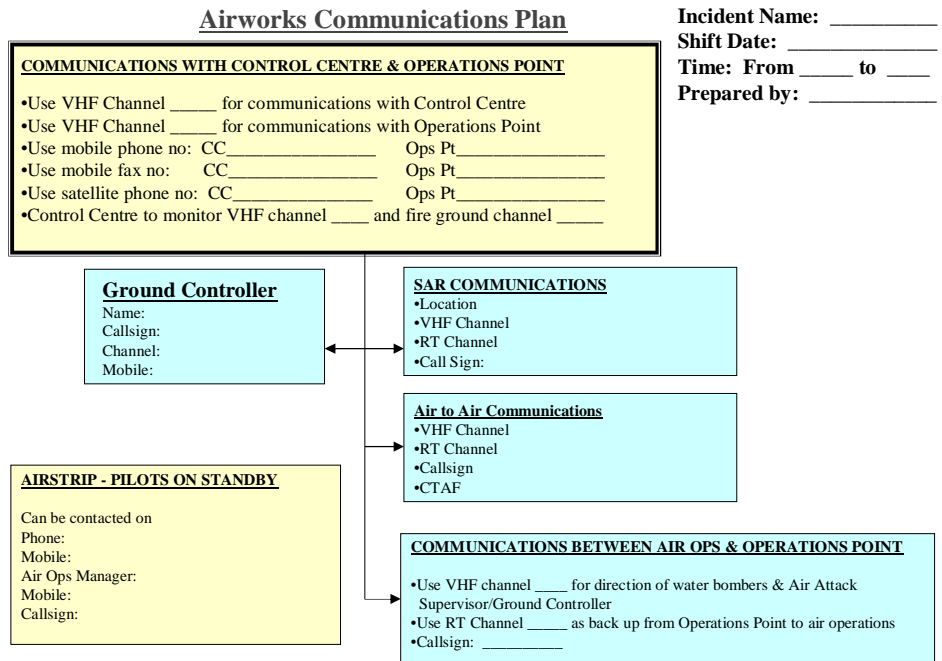




### Air Operations Communications Plan



### Airworks Communications Plan





**Communications Plan  
Contacts List**

Incident Name: \_\_\_\_\_

Shift Date: \_\_\_\_\_

Time: From \_\_\_\_\_ to \_\_\_\_\_

Prepared by: \_\_\_\_\_

Org.	Name	Location	Phone-Ext.	Fax No.	Callsign	Channel	Other Contact (Mobile/Sat Ph)

PREPARED BY: \_\_\_\_\_

**CONTROL CENTRE COMMUNICATIONS PLAN**

ICS 7.1 7/02  
 District \_\_\_\_\_ Incident Number \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_ for Period \_\_\_\_\_ hrs to \_\_\_\_\_ hrs Time Prepared \_\_\_\_\_

<b>Phone Lines In</b>	1.	2.	3.	4.	5.	6.	7.
<b>Fax Lines</b>	1.	I/O	2.	I/O	3.	I/O	4.
<b>Radio Channel</b>	CC ↔ Ops						I/O
	CC ↔						

**ICS Roles**

Role	Name	Phone (& extension)	Mobile Phone	Location/Room No.	Callsign	Channel
<b>Incident Controller</b>						
Safety Officer						
Liaison Officer						
<b>Planning Officer</b>						
Situation Officer						
Resources Officer						
Information Services Officer						
Management Support Officer						
<b>Logistics Officer</b>						
Supply Officer						
Facilities Officer						
Ground Support Officer						
Catering Officer						
Communications Officer						
Finance Officer						
Medical Services Officer						

**Duty Roles**

<b>District Duty Officer</b>						
<b>Regional Duty Officer</b>						
<b>Departmental Duty Officer</b>						

**Other Organisations & Roles**

Organisation / Role	Name	Phone (& extension)	Mobile Phone	Location/Room No.	Callsign	Channel
Airbase						



