The Senate

Environment and Communications References Committee

The capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters

November 2011

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Recommendations

Recommendation 1

2.11 The committee recommends that interoperability of narrowband voice radiocommunications between federal, state and territory emergency service organisations is achieved as soon as practicable and that all services attending major incidents be compelled to maintain a common emergency communications platform to ensure seamless real time communication from and to the Incident Controller.

Recommendation 2

2.50 The committee recommends the Commonwealth Government allocate sufficient spectrum for dedicated broadband public protection and disaster relief (PPDR) radiocommunications in Australia.

2.51 The committee further recommends that any allocation of broadband spectrum to emergency service organisations (ESOs) for PPDR must be provided on the basis of interoperability amongst Australian ESOs and with ESO counterparts overseas.

Recommendation 3

3.63 The committee recommends that the Commonwealth Government together with national, state and territory emergency service organisations and radio and television broadcasters, develop a secure database of up-to-date contact details for key personnel to be used during an emergency.

Recommendation 4

3.69 The committee recommends the Commonwealth Government require guaranteed access to emergency call services for people with a disability at all times.

Recommendation 5

3.81 The committee recommends emergency service organisations in collaboration with television and radio broadcasters, the print media and other relevant organisations, use regular and ongoing public education well in advance of an emergency situation as an opportunity to teach the public about their responsibilities during an emergency and how they can appropriately prepare themselves for such an event.

Recommendation 6

4.33 The committee recommends the government consider granting public broadcasters priority access to fuel during times of emergency for the purpose of broadcasting emergency warnings and information, and in a way that does not impede the ability of emergency service organisations to access fuel.

Acronyms and Abbreviations

ABC	Australian Broadcasting Corporation
ACCAN	Australian Communications Consumer Action Network
ACMA	Australian Communications and Media Authority
AFAC	Australasian Fire and Emergency Service Authorities Council
AFP	Australian Federal Police
AMTA	Australian Mobile Telecommunications Association
ANZPAA	Australia New Zealand Policing Advisory Agency
APT	Asia-Pacific Telecommunity
Auslan	Australian sign language
AWG	Asia-Pacific Telecommunity Wireless Group
CIRS	Critical Infrastructure Resilience Strategy
CMTS	cellular mobile telephone service
COAG	Council of Australian Governments
COW	Cells on Wheels
CRA	Commercial Radio Australia
CSG	Communications Sector Group
CTS	cordless telephone service
DBCDE	Department of Broadband, Communications and the Digital Economy
DSRR	digital short range radio
ECP	emergency call person
ESO	emergency service organisation
FCC	United States Federal Communications Commission

FESA	Fire and Emergency Services Agency of Western Australia
GSM	global system for mobile communications
ISM	industrial, scientific, medical
ITU	International Telecommunications Union
LGAQ	Local Government Association of Queensland
MEOW	Mobile Exchanges on Wheels
MHz	megahertz
MOU	memorandum of understanding
NBN	National Broadband Network
NCCGR	National Coordination Committee for Government Radiocommunications
NCID	National Council on Intellectual Disability
NHK	Nippon Hoso Kyokai (Japan Broadcasting Corporation)
NPSPAC	National Public Safety Planning Advisory Committee
NRS	National Relay Service
PFA	Police Federation of Australia
PPDR	public protection and disaster relief
PSBL	Public Safety Broadband License
PSSTC	Public Safety Spectrum Trust Corporation
P2P	fixed point to point
RSS	Really Simple Syndication
SAFECOM	South Australian Fire and Emergency Services Commission
SatCOW	Satellite Cells on Wheels
SBS	Special Broadcasting Service
SCPEM	Standing Council for Police and Emergency Management

SES	State Emergency Service
SEWS	standard emergency warning signal
the Act	*Radiocommunications Act 1992*
the Committee	Senate Environment and Communications References Committee
TCP	Transmission Control Protocol
TTY	teletypewriter
YellowBird ALERT	YellowBird Automatic Linking to Emergency Radio Transmissions

Chapter 1

Introduction

The conduct of the inquiry

1.1 On 3 March 2011, the Senate referred the following matter to the Environment and Communications References Committee (the committee) for inquiry and report by 2 November 2011:

> The capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters, with particular reference to:
>
> a) the effectiveness of communication networks, including radio, telephone, Internet and other alert systems (in particular drawing on the spate of emergencies and natural disasters of the 2010/2011 Australian summer):
>
> i. in warning of the imminent threat of an impending emergency,
>
> ii. to function in a coordinated manner during an emergency, and
>
> iii. to assist in recovery after an emergency;
>
> b) the impact of extended power blackouts on warning systems for state emergency services, including country fire brigades and landholders or home owners;
>
> c) the impact of emergencies and natural disasters on, and implications for, future communication technologies such as the National Broadband Network;
>
> d) the scope for better educating people in high-risk regions about the use of communications equipment to prepare for and respond to a potential emergency or natural disaster;
>
> e) new and emerging technologies including digital spectrum that could improve preparation for, responses to and recovery from, an emergency or natural disaster; and
>
> f) any other relevant matters.

1.2 On 2 November 2011, the Senate agreed to an extension of time to report until 23 November 2011.

1.3 In accordance with its usual practice, the committee advertised details of the inquiry in *The Australian* and on the internet. The committee also contacted a range of organisations inviting submissions. The committee received 47 submissions, listed at Appendix 1.

1.4 The committee held two public hearings in Canberra on 8 and 9 August 2011. Details of these public hearings are shown at Appendix 2. The committee thanks all those organisations and individuals who contributed to the inquiry.

Background

Recent natural disasters in Australia

1.5 As a result of various natural disasters around Australia during the last decade, several state and territory governments have conducted, or are currently conducting, inquiries to examine ways in which the devastating effects of similar events could be avoided or minimised in the future.

1.6 Recent inquiries into natural disasters in Australia include the Australian Capital Territory (ACT) Coroner's inquests and inquiry into the Canberra firestorm in January 2003 and the 2009 Victorian Bushfires Royal Commission (the Royal Commission) examining the deadly fires in that state on 7 February 2009. At present, the Queensland Floods Commission of Inquiry is examining the floods that occurred during December 2010 and January 2011.

1.7 In their final reports, both the ACT Coroner and the Royal Commission made recommendations regarding emergency communications and warning systems.

1.8 The interim report of the Queensland Floods Commission of Inquiry, released on 1 August 2011, also made numerous recommendations pertinent to this inquiry.

1.9 The reports handed down in the ACT, Victoria and Queensland shared common themes about the use and effectiveness of emergency communications. All of the reports emphasised the need for interoperability of emergency service organisation telecommunication systems, and recommended improvements to the way in which the public is warned about an impending emergency (including the timeliness of and information contained within these warnings). These issues are discussed in subsequent chapters of this report.

1.10 A more detailed summary of the inquiries into these recent natural disasters is at Appendix 3.

Radiocommunications in Australia

The Radiocommunications Act 1992

1.11 The legislative framework for the management of radiofrequency spectrum in Australia, including spectrum plans and frequency band plans, spectrum licensing and apparatus licences, is provided by the *Radiocommunications Act 1992* (the Act).[1]

1.12 The objects of the Act, relevant to emergency communications and the current inquiry, are as follows:

> ...to provide for management of the radiofrequency spectrum in order to:

1 See the *Radiocommunications Act 1992*.

(a) maximise, by ensuring the efficient allocation and use of the spectrum, the overall public benefit derived from using the radiofrequency spectrum;

(b) make adequate provision of the spectrum:

(i) for use by agencies involved in the defence or national security of Australia, law enforcement or the provision of emergency services; and

(ii) for use by other public or community services...[2]

1.13 The Australian Communications and Media Authority (the ACMA) is responsible for the regulation of broadcasting, the internet, radiocommunications and telecommunications.[3] With respect to radiocommunications, the ACMA plans and manages radiofrequency spectrum in Australia. It is also responsible for compliance with licensing requirements and investigating complaints of interference to services.[4]

ESOs' reliance on radiocommunications

1.14 Emergency Service Organisations (ESOs) rely on radiocommunications for their voice and data communication needs. ESOs use narrowband radiofrequency spectrum for voice (for example two-way radio) communication systems, while broadband radiofrequency spectrum is needed for data communication such as mobile internet to send photographs, videos and maps. Due to the growing range of technologies, capabilities and services available via broadband, ESOs are becoming increasingly reliant on data communications. ESOs particularly rely on radiocommunications during emergency situations.

Interoperability of ESO voice radiocommunications

1.15 At its meeting on 7 December 2009, the Council of Australian Governments (COAG) endorsed the *National Framework to Improve Government Radiocommunications Interoperability*.[5] The framework provides a set of guiding principles and key areas of work to enhance the interoperability of ESO voice radiocommunications over the period to 2020.[6] The framework defines radiocommunications as 'mobile radio networks' that:

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2 *Radiocommunications Act 1992*, s. 3.

3 Australian Communications and Media Authority (ACMA), *About the ACMA's role*, available: www.acma.gov.au/WEB/STANDARD/pc=ACMA_ROLE_OVIEW (accessed 19 October 2011).

4 ACMA, *About communications and media regulation*, available: www.acma.gov.au/WEB/STANDARD/pc=PUB_REG_ABOUT (accessed 19 October 2011).

5 Emergency Management Australia (Attorney-General's Department), *Implementation of National Interoperability Framework Briefings*, available: www.ag.gov.au/www/emaweb/emaweb.nsf/Page/FundingandGrants_NationalEmergencyManagementProjects_NEMP2010-2011_ImplementationofNationalIntroperabilityFrameworkbriefings (accessed 6 October 2011).

6 Emergency Management Australia (Attorney-General's Department), *Implementation of National Interoperability Framework Briefings*, p. 1.

- allow one user to simultaneously talk to many other users, which is critical in broadcasting warnings such as the need to evacuate a collapsing building;
- have a restricted number of users, which makes radio networks less likely to congest in emergency conditions; and
- transmit at relatively high power, which provides a wider area of coverage per cell and which makes radio networks less impacted by power outages.[7]

1.16 The framework states:

> Mobile radio is the fundamental basis for communications in emergency situations, a situation that is unlikely to change in the foreseeable future.
>
> However, agencies responding to emergencies are often hampered by low levels of radiocommunications interoperability to effectively communicate with other agencies within their jurisdiction or other jurisdictions.
>
> ...
>
> This Framework provides a basis to use current and future opportunities, including the current review of government spectrum allocation to address shortfalls in emergency communications that have existed for over 35 years.
>
> ...
>
> The National Framework suggests an indicative ten-year timeframe to allow jurisdictions sufficient time to align technical requirements with their procurement cycles and thus significantly mitigate any cost of change. Most jurisdictions are already either implementing or planning their next technology refresh and all jurisdictions will most likely do so in the Framework's timeframe.[8]

Possible future spectrum allocations

A note on spectrum nomenclature

1.17 Different nomenclature for spectrum was used by submitters during the course of the inquiry. In particular, submitters frequently referred to 800 MHz spectrum. This

7 Emergency Management Australia (Attorney-General's Department), *Implementation of National Interoperability Framework Briefings*, p. 1.

8 Council of Australian Governments (COAG), *National Framework to Improve Government Radiocommunications Interoperability: Towards a harmonised radiocommunications environment for public protection and disaster relief 2010–2020*, available: www.ag.gov.au/www/emaweb/rwpattach.nsf/VAP/(3A6790B96C927794AF1031D9395C5C20)~Nationa+Framework+to+Improve+Government+Radiocommunications.pdf/$file/Nationa+Framework+to+Improve+Government+Radiocommunications.pdf (accessed 6 October 2011), pp 1 and 2.

800 MHz spectrum is currently being considered by the ACMA as part of its review of the "900 MHz band".[9]

1.18 This report uses "700 MHz band" to refer to 694–803 MHz spectrum and "800 and 900 MHz bands" to refer to 803–890 MHz together with 890–960 MHz spectrum.[10]

The "digital dividend"

1.19 The switchover from analog to digital free-to-air television in Australia (due to be completed by 31 December 2013) will result in radiofrequency spectrum previously used for analogue television becoming vacant.[11] This spectrum, from 694 to 820 MHz, is referred to as the "digital dividend" and falls largely within the 700 MHz band.[12]

1.20 Following public consultation in response to a green paper, the Federal Government announced on 24 June 2010 that '126 MHz of contiguous spectrum in the frequency range 694 to 820 MHz inclusive' would be released.[13] The government plans to auction the digital dividend spectrum during the second half of 2012 'allowing successful bidders ample time to plan and deploy the next generation networks that are likely to utilise the spectrum'.[14]

1.21 The process for releasing the digital dividend spectrum involves:

- switchover—converting free-to-air television services from analogue to digital signals. Once this conversion is complete, the analogue signals will be switched off and the parts of the spectrum formerly used for analogue transmissions will become available for alternative uses.

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9 ACMA, *900 MHz Review Project Plan*, available: www.acma.gov.au/webwr/_assets/main/lib312085/900%20mhz%20review%20project%20plan.pdf (accessed 3 October 2011), p. 3 and ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, available: www.acma.gov.au/webwr/_assets/main/lib312085/900mhz_review-exploring_new_opportunities.pdf (accessed 5 October 2011), p. 7.

10 There is a 3 MHz guard band between 803–806 MHz.

11 Department of Broadband, Communications and the Digital Economy (DBCDE), *Digital dividend*, available: www.dbcde.gov.au/consultation_and_submissions/digital_dividend (accessed 27 September 2011).

12 DBCDE, *Digital dividend*, available: www.dbcde.gov.au/consultation_and_submissions/digital_dividend (accessed 27 September 2011).

13 DBCDE, *Digital dividend*, available: www.dbcde.gov.au/consultation_and_submissions/digital_dividend (accessed 27 September 2011).

14 Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, *media release*, 24 June 2010.

- re-stack—clearing digital broadcasting services from the digital dividend frequency range and reorganising them more efficiently in the remaining broadcasting spectrum below 694 MHz. This will enable the 694–820 MHz spectrum to be made available to new users. The restack is expected to be completed by the end of 2014.
- re-allocation—packaging and auctioning of the digital dividend spectrum for new services.[15]

1.22 The ACMA is responsible for allocating the digital dividend spectrum. As part of this process, the ACMA conducted consultation on the configuration and allocation of the digital dividend spectrum between October and December 2010.[16] The purpose of this consultation 'was to obtain input from stakeholders on issues that would influence the ACMA's approach to the configuration and allocation of the band'.[17]

1.23 The draft recommendations in the ACMA's *Draft spectrum reallocation recommendations for the 700 MHz digital dividend and 2.5 GHz bands: information paper* stated '[t]wo 45 MHz blocks of spectrum, with frequency boundaries 703–803 MHz' would be reallocated between 2 November 2011 and 31 December 2014.[18] The digital dividend spectrum from 806–820 MHz would 'be considered under [the ACMA's] 900 MHz review'.[19]

1.24 On 27 May 2011, the ACMA announced it would proceed with an auction of new spectrum licences in the 700 MHz band (and the 2.5 GHz band) in late 2012.[20] The ACMA has not yet announced the exact date for the auction, or the number of allocations to be auctioned.[21]

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15 DBCDE, *Digital dividend*, available: www.dbcde.gov.au/consultation_and_submissions/digital_dividend (accessed 27 September 2011).

16 ACMA, *Consultation on the configuration and allocation of digital dividend spectrum*, available: www.acma.gov.au/WEB/STANDARD/pc=PC_312285 (accessed 27 September 2011).

17 ACMA, *Draft spectrum reallocation recommendations for the 700 MHz digital dividend and 2.5 GHz bands: information paper*, May 2011, p. 1.

18 ACMA, *Draft spectrum reallocation recommendations for the 700 MHz digital dividend and 2.5 GHz bands: information paper*, May 2011, p. 4.

19 ACMA, *Draft spectrum reallocation recommendations for the 700 MHz digital dividend and 2.5 GHz bands: information paper*, May 2011, p. 6.

20 ACMA, 'ACMA moves ahead with auction of spectrum in the 700 MHz (digital dividend) and 2.5 GHz bands', Media release 50/2011, 27 May 2011.

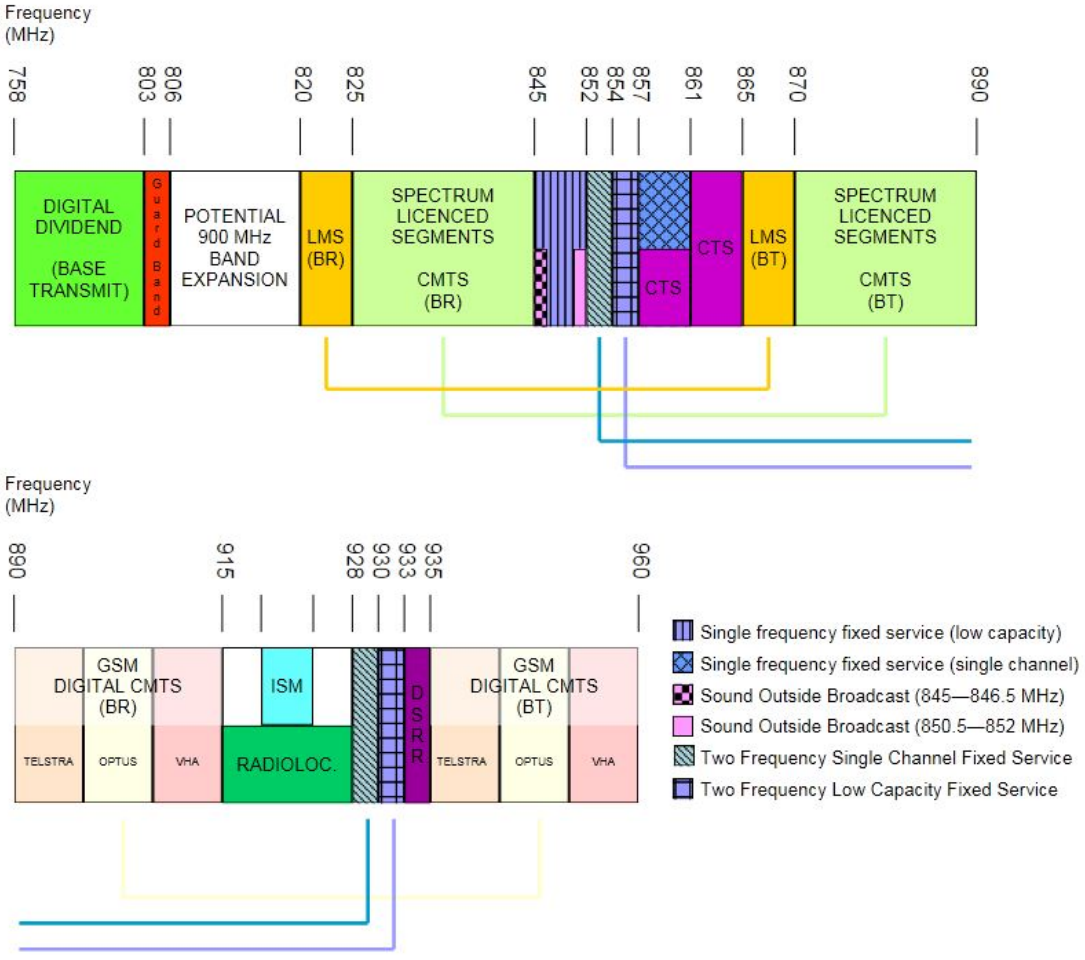
21 ACMA, *Radiofrequency spectrum auctions list*, available: www.acma.gov.au/WEB/STANDARD/pc=PC_364 (accessed 6 October 2011).

The ACMA's 900 MHz band review

1.25 In May 2011, the ACMA commenced the public part of its review of the 900 MHz band. The review will examine spectrum from 806 to 960 MHz excluding 825–845 paired with 870–890 MHz (these segments are currently allocated to the cellular mobile telephone service (CMTS) under spectrum licensing).[22] This is known as the "900 MHz band review" even though it includes consideration of portions of the 800 MHz band.

1.26 Current spectrum allocations in the 800 and 900 MHz bands in Australia are shown in Figure 1.

Figure 1—Assignments in the 800 and 900 MHz bands (September 2010)



Source: courtesy of the ACMA.

22 ACMA, *900 MHz Review Project Plan*, available: www.acma.gov.au/webwr/_assets/main/lib312085/900%20mhz%20review%20project%20plan.pdf (accessed 3 October 2011), p. 3 and ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, available: www.acma.gov.au/webwr/_assets/main/lib312085/900mhz_review-exploring_new_opportunities.pdf (accessed 5 October 2011), p. 7.

1.27 According to the ACMA, the purpose of the review is threefold:

- ...parts of the band are unused or lightly used due to allocations to outmoded technologies. The [800 and 900 MHz bands are] 'prime spectrum' because of its ability to carry signals over long distances, penetrate buildings and carry large amounts of data. It is therefore important to make it possible for the band to transition to its highest value use to achieve the maximum public benefit.
- This band sits just above the broadcasting services bands historically used for high powered television services. Recent Australian Government decisions to put to market the so-called "digital dividend" spectrum (694–820 MHz) raises issues around the manner in which the adjoining spectrum is currently used and allocated. This is particularly the case because...the current draft plan for a harmonised [International Telecommunication Union] Region 3[23] digital dividend arrangement only extends to 803 MHz with a 3 MHz guard band extending to 806 MHz, where as the Australian digital dividend extends to 820 MHz. This arrangement provides a unique opportunity to consider expanding the [800 and 900 MHz bands] to facilitate new services.
- The 890–915 MHz paired with 935–960 MHz segments are currently allocated to the digital cellular mobile telephone service (CMTS). The bands are currently planned for [global system for mobile], whereas internationally there is a move to "refarm" this spectrum to better facilitate 3G and 4G technologies. Domestically, current users of the band are already implementing 3G technologies in these segments. Therefore, it is timely to review whether current arrangements are still appropriate as services migrate towards newer technologies.[24]

1.28 As part of the review of 800 and 900 MHz bands, the ACMA is considering 'the possibility of using the 900 MHz expansion band [between 806–820 MHz] for public protection and disaster relief (PPDR) radiocommunication systems'.[25] The ACMA explains:

> Through the [Asia-Pacific Telecommunity Wireless Group (AWG)], the Asia-Pacific Telecommunity [(APT)] is currently investigating possible harmonisation of frequency bands for PPDR radiocommunication systems in [ultra high frequency] bands. In particular, the APT is considering the 806–824 MHz paired with 851– 869 MHz bands for harmonised PPDR

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23 The International Telecommunication Union (ITU) defines Region 3 as Asia and Australasia.

24 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, pp 5–6.

25 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 34.

'Public protection and disaster relief (PPDR) radiocommunication systems are those used by agencies and organisations dealing with maintenance of law and order, protection of life and property, and emergency situations on a day-to-day basis. Additionally, these systems are used by agencies and organisations dealing with serious disruptions to the functioning of society, which pose a significant, widespread threat to human life, health, property, or the environment' (see ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 33.

> across some countries in Region 3. These segments are already allocated for PPDR systems in some Region 3 countries, including Korea. The PPDR systems currently used internationally in this segment are based on narrowband technologies. It has been proposed that the AWG also consider developing harmonised plans to enable broadband technologies based on work currently underway in [the Third Generation Partnership Project].
>
> Parts of the band are also used for PPDR systems in the US. The 806–809 MHz paired with 851–854 MHz segments are designated for use by local, regional and state public safety agencies under guidelines developed by the National Public Safety Planning Advisory Committee (NPSPAC). The 809–815 MHz paired with 854–860 MHz segments and the 815–816 paired with 860–861 MHz segments are designated for public safety using non-cellular specialised mobile radio.
>
> Should the expansion of two-frequency services using the 900 MHz expansion band be pursued, there is potential for PPDR systems to use the band. An allocation to PPDR in this band would be particularly attractive if it is designated as a harmonised frequency band for PPDR radiocommunications across other Region 3 countries.[26]

1.29 The future use of the digital dividend (700 MHz band) or spectrum in the 800 and 900 MHz bands for PPDR radiocommunications was explored at length during the inquiry. This issue is discussed in Chapter 2.

Public Safety Mobile Broadband Steering Committee

1.30 The Public Safety Mobile Broadband Steering Committee was established in May 2011 by the Attorney-General's Department and the Department of Broadband, Communications and the Digital Economy (DBCDE) to:

- report to commonwealth, state and territory ministers and the Standing Council for Police and Emergency Management (SCPEM) on the most effective and efficient way for Australia's public safety agencies to obtain a reliable and robust mobile broadband capability that meets the operational requirements of ESOs, and the potential for allocation of radio-frequency in this regard; and
- work with the Australian Communications and Media Authority (ACMA) as part of its review of the 805–890 MHz frequency range to identify a suitable amount of spectrum necessary to meet foreseeable operational needs.[27]

1.31 The Steering Committee is co-chaired by deputy secretaries from the Attorney-General's Department and DBCDE. Membership comprises senior

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26 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, pp 33–34.

27 Attorney-General's Department, *Public Safety Mobile Broadband Steering Committee: Terms of Reference*, available: www.ag.gov.au/www/agd/agd.nsf/Page/National_security (accessed 19 October 2011), p. 1.

representatives from these departments, the ACMA and state and territory public safety agencies including (but not limited to) the:

- Australia New Zealand Policing Advisory Agency (ANZPAA);
- Australasian Fire and Emergency Service Authorities Council (AFAC);
- Council of Ambulance Authorities;
- National Counter-Terrorism Committee; and
- National Emergency Management Committee.[28]

1.32 The Steering Committee will report to COAG through SCPEM by 29 February 2012.[29]

Issues raised during the inquiry

1.33 Various issues were raised during the course of the inquiry, including:

- the availability of spectrum for use by emergency service organisations (ESOs) for dedicated broadband PPDR radiocommunications, specifically spectrum in the 700 MHz band versus the 800 and 900 MHz bands;
- the use and effectiveness of warnings in emergency situations, including the role of television and radio broadcasters, and community preparedness and responsibility; and
- the resilience and redundancy of communications infrastructure in emergency situations.

1.34 Each of these issues is discussed in greater detail in the following chapters of this report.

28 Attorney-General's Department, *Public Safety Mobile Broadband Steering Committee: Terms of Reference*, p. 2.

29 Attorney-General's Department, *Public Safety Mobile Broadband Steering Committee: Terms of Reference*, p. 3.

Chapter 2

Availability of spectrum for public protection and disaster relief radiocommunications

2.1 This chapter examines the availability of spectrum for use by emergency service organisations (ESOs) for both narrowband and broadband public protection and disaster relief (PPDR) radiocommunications.

2.2 Narrowband radiocommunications refers to voice communications, for example two-way radio. ESOs in Australia typically use spectrum in the 400 MHz band for their narrowband voice communications.

2.3 Broadband radiocommunications refers to data communications, such as mobile internet used to transmit photos, videos and maps. The possible future use of spectrum in the 700 MHz band or 800 and 900 MHz bands for broadband radiocommunications by ESOs is the subject of much of this chapter.

2.4 ESOs were of the view they required dedicated broadband spectrum, in addition to their current narrowband spectrum allocations, to meet their needs as technology advances and data requirements increase. Some ESOs argued strongly for spectrum from the digital dividend (700 MHz band) whilst others were undecided about whether spectrum from the 700 MHz band or 800 and 900 MHz bands should be allocated for PPDR in Australia, so long as a suitable allocation of broadband spectrum is made. Telecommunication organisations contested the suggestion that ESOs required dedicated broadband spectrum for PPDR radiocommunications and opined that the 700 MHz band should be allocated to telecommunications companies for commercial use.

Narrowband communications

Use of the 400 MHz band and interoperability of voice communications

2.5 At present, the 400 MHz band is used by federal, state and territory ESOs for narrowband radiocommunications. The police, fire and ambulance services in every state and territory except Tasmania, as well as the Australian Federal Police (AFP) and Australian Customs and Border Protection Service (Customs), currently use spectrum in this band (see Figure 2). The Tasmanian police service uses spectrum in the 800 MHz band.[1]

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1 Australian Communications and Media Authority (ACMA), *Spectrum Proposals: 403–520 MHz Proposals for future arrangements in the 400 MHz band*, March 2009, available: www.acma.gov.au/webwr/_assets/main/lib310832/ifc08-2009_spectrum_proposals_403-520_mhz.pdf (accessed 6 September 2011), p. 88.

Figure 2—Overview of existing voice radiocommunications used by federal, state and territory agencies

State	Agency	VHF	403–420 MHz	420–430 MHz	450–470 MHz (LEPS)	480 MHz (CT)	500–520 MHz (Spectrum Licence)	800 MHz	Comments
New South Wales	Police Fire Ambulance Other government		State GRN						Police have flagged intention to join GRN when possible
Victoria	Police Fire Ambulance Other government	SMR Rural Service	MMR	MMR	MMR	MMR	MMR In-building		
Queensland	Police Fire Ambulance Other government	Rural Service			Not in LEPS	Not in LEPS			Trailing IDAS radios for ambulance services
South Australia	Police Fire Ambulance Other government		State GRN						
Western Australia	Police Fire Ambulance Other government				Outside of metro SES				2006 new roll out of ES network that is dual band VHF/UHF
ACT	Police Fire Ambulance Other government		NSW GRN						
Northern Territory	Police Fire Ambulance Other government				State GRN				New P25 emergency services network planned for 2010+ 403-430 MHz
Tasmania	Police Fire Ambulance Other government								
Commonwealth	AFP Customs								

Technology		
Trunked	Smartzone P25	
	Smartzone 4.1	
	Smartzone 3.0	
	EDACS	
	MPT1327	
	Astro 25	
Conventional	Analog PMR	
	P25	

Glossary	
GRN	Government Radio Network
SMR	State Mobile Radio
MMR	Metropolitan Mobile Radio
IDAS	ICOM Digital Advanced System
P25	APCO Project 25
EDACS	Enhanced Digital Access Communication Systems

Source: courtesy of the ACMA

2.6 Narrowband spectrum such as in the 400 MHz band, can be used for voice communications but cannot be used effectively for data radiocommunications because the size of each spectrum allocation is too small to enable the transmission of large files such as photos, videos and maps. Motorola Solutions explained why narrowband spectrum should not be used for data applications:

> ...a system that makes use of 20 MHz of spectrum (10 MHz for the downlink and 10 MHz for the uplink, or 10+10 MHz) will have more bandwidth available on a per-sector basis than a system that deploys a total of 10 MHz of bandwidth (a 5+5-MHz system). The difference is roughly 50%; that is, in a 20-MHz system, the network operator will have twice the available bandwidth than a network operator that builds out a system in only 10 MHz of spectrum.
>
> The consequence of insufficient spectrum is restricted capacity, which combined with high demand, causes network congestion. For applications, this means sluggish behaviour or outright failures. Beyond sluggish performance in congestion situations, there is also the high likelihood that networks simply have to drop packets of data. Packets arrive at a base station over a high-speed connection such as fiber but then the base station forwards the packets using the slower radio connection. If there are too many incoming packets the inevitable result is that the base station, or infrastructure nodes prior to the base station, will drop or significantly delay packets.
>
> Consequences of such congestion are not just slower performance but also application failures. Most communications protocols implement timeouts on their operations, including Transmission Control Protocol (TCP) itself, the packet-transport protocol used in the Internet to provide reliable end-to-end delivery. With large delays or dropped packets, communications protocols attempt to deliver data reliably, but at some level of congestion, they can no longer cope properly, and applications will either indicate a failure, or worse yet, require an application or full-system restart.[2]

2.7 The AFP and Australia New Zealand Policing Advisory Agency (ANZPAA) indicated that ESOs have a growing need for broadband spectrum as they implement increasingly sophisticated tools, for example automated number plate recognition and 'biometric infield wireless radio detection systems', for which narrowband spectrum is unsuitable.[3]

2.8 The AFP explained that Australian police services (state, territory and federal) would continue to use 400 MHz spectrum for voice communications and were seeking to achieve interoperability:

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2 Motorola Solutions, *Supplementary Submission 10*, pp 6–7.

3 Mr Andrew Scipione, Board Member, Australia New Zealand Policing Advisory Agency (ANZPAA), *Proof Committee Hansard*, 9 August 2011, p. 6; and
Deputy Commissioner Michael Phelan, Close Operations Support, Australian Federal Police (AFP), *Proof Committee Hansard*, 8 August 2011, p. 3.

> Apart from us all trying to move towards something in the next five years, on the voice side, with ACMA, we are looking at harmonisation across the 400-megahertz spectrum, which involves all voice communications. We are trying to do our best to harmonise all the equipment in the spectrum available there.[4]

2.9 The Australian Communications and Media Authority (the ACMA) confirmed that ESOs are moving towards interoperability of voice communications in the 400 MHz band:

> ...we now have an agreement between all the states and territories to move towards interoperability for narrowband communications in accordance with a COAG plan. That plan will come into being around mid-2020. That is its final date. The reason it is so far out is that some states, such as Tasmania, have bought equipment and are operating in other bands. Tasmania operates in part of the [900] megahertz band, not the 700. The 700 is purely full of television broadcasting at the moment. So they are a bit higher up—they are actually in the [900] megahertz band—and they use narrowband. Western Australia is in the 500 megahertz band.
>
> We want all of the states eventually to be in the 400 megahertz band, but we understand that they are all in different places in their procurement cycles and it would be unreasonable for us to expect them to shut off equipment that still has a reasonable life. The plan is flexible, but we would expect that sometime between 2015 and 2020 all of those states and territories come into the 400 megahertz band for their narrowband communications and operate within the parameters of the COAG agreement. This has been agreed at COAG but it has also been agreed by the NCCGR, the National Coordination Committee for Government Radiocommunications.
>
> Both Tasmania and Western Australia operate in different bands but they will come back into the 400 megahertz band...[5]

Committee view

2.10 The committee recognises the need for nation-wide interoperability of narrowband voice radiocommunications systems to enable effective communication between state, territory and federal ESOs during times of emergency. The need for interoperability has been acutely demonstrated by the difficulties encountered during, and lessons learnt following recent natural disasters. The committee supports the COAG agreement to achieve interoperability of ESO narrowband voice radiocommunications in the 400 MHz band, and recommends that this is achieved as soon as practicable, noting the constraints necessitated by jurisdictional procurement timeframes.

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4 Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 2.

5 Dr Andrew Kerans, Executive Manager, Spectrum Infrastructure Branch, ACMA, *Proof Committee Hansard*, 9 August 2011, pp 34–35.

Recommendation 1

2.11 The committee recommends that interoperability of narrowband voice radiocommunications between federal, state and territory emergency service organisations is achieved as soon as practicable and that all services attending major incidents be compelled to maintain a common emergency communications platform to ensure seamless real time communication from and to the Incident Controller.

Broadband communications

Current use of the 700 MHz band

2.12 As discussed briefly in Chapter 1, the 700 MHz band is currently used for analog free-to-air television. However, as Australia switches to digital television, radiofrequency spectrum from 694 to 820 MHz will become vacant. It is the federal government's intention to auction 2x45 MHz of this spectrum during the second half of 2012.[6]

Use of the 800 and 900 MHz bands

2.13 Radiofrequency spectrum from 820–890 MHz in the 800 MHz band and 890–960 MHz in the 900 MHz band is currently used for:

- land mobile;
- cellular mobile telephone service (CMTS);
- fixed point to point (P2P);
- cordless telephone service (CTS);
- digital CMTS;
- industrial, scientific, medical (ISM);
- radio-location; and
- digital short range radio (DSRR).[7]

2.14 As discussed in Chapter 1, the ACMA is currently conducting a review of the 800 and 900 MHz bands (the "900 MHz band review"). This review includes

6 ACMA, 'ACMA moves ahead with auction of spectrum in the 700 MHz (digital dividend) and 2.5 GHz bands', Media release 50/2011, 27 May 2011.

7 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, available: www.acma.gov.au/webwr/_assets/main/lib312085/900mhz_review-exploring_new_opportunities.pdf (accessed 5 October 2011), p. 50.

consideration of 'the possibility of using the 900 MHz expansion band for public protection and disaster relief (PPDR) radiocommunication systems'.[8]

International use of spectrum

700 MHz spectrum

United States of America

2.15 The United States of America (USA) has announced its intention to deploy a public safety mobile broadband network in the 700 MHz band.[9]

2.16 In July 2007, the US Federal Communications Commission (FCC) adopted the *700 MHz Second Report and Order* that established:

> ...a regulatory framework for the 700 MHz public safety band to facilitate the establishment of a nationwide, interoperable broadband communications network for the benefit of state and local public safety users. The FCC allocated 10 MHz of 700 MHz spectrum for an advanced, public safety broadband network to be implemented by a public/private partnership. The parties are required to adopt, subject to ultimate FCC approval, a broadband standard with a nationwide level of interoperability.[10]

2.17 The *700 MHz Second Report and Order* allocated sections of the 700 MHz Public Safety Band (763–768/793–798 MHz) for broadband communications.[11]

2.18 The FCC also established a single nationwide "Public Safety Broadband License" (PSBL) for the 700 MHz public safety broadband spectrum.[12] On 19 November 2007 the Commission assigned this licence to the Public Safety Spectrum Trust Corporation (PSSTC). The FCC stated:

> The PSBL and...commercial licensee will form a Public Safety/Private Partnership to develop a shared, nationwide interoperable network for both

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8 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 34.

9 DBCDE, *Fact sheet 4: Public safety mobile broadband capability 800 MHz band spectrum—international frameworks and trends*, available: www.dbcde.gov.au/__data/assets/pdf_file/0018/139122/Fact_sheet_4-800_MHz_band_spectrum-international_frameworks-and_trends.pdf (accessed 19 October 2011), p. 1.

10 US Federal Communications Commission (FCC), *Public Safety and Homeland Security Bureau: Interoperability*, available: http://transition.fcc.gov/pshs/emergency-information/interoperability.html (accessed 19 October 2011).

11 FCC, *700 MHz Second Report and Order*, July 2007, available: http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-07-132A1.pdf (accessed 19 October 2011), p. 128.

12 FCC, *Public Safety and Homeland Security Bureau: Public Safety/Private Partnership*, available: http://transition.fcc.gov/pshs/public-safety-spectrum/700-MHz/partnership.html (accessed 19 October 2011).

> commercial and public safety users. This network will provide public safety entities access to new broadband technologies across the country.
>
> ...
>
> The public safety broadband network will facilitate effective communications among first responders not just in emergencies, but as part of cooperative communications plans that will enable first responders from different disciplines, such as police and fire departments, and jurisdictions to work together in emergency preparedness and response.
>
> Under the Partnership, the PSBL will have priority access to the commercial spectrum in times of emergency, and the commercial licensee will have pre-emptible, secondary access to the public safety broadband spectrum. Providing for shared infrastructure will help achieve significant cost efficiencies while maximizing public safety's access to interoperable broadband spectrum.[13]

2.19 The Department of Broadband, Communications and the Digital Economy (DBCDE) and the ACMA advised the committee that the band plan in which the US 700 MHz public safety mobile broadband network has been allocated is not in alignment with the 700 MHz band plan adopted in Australia. As a result, DBCDE and ACMA stated that US 700 MHz public safety equipment (for example handsets) would not be able to operate in Australia even if ESOs were allocated a portion of the 700 MHz band in Australia.[14]

Asia Pacific

2.20 The Asia-Pacific Telecommunity Wireless Group (AWG) has been considering harmonisation of the 700 MHz band planning arrangements in the Asia Pacific region.[15] The AWG's proposal for harmonisation of the 700 MHz band includes a guard band from 803–806 MHz which means (given the difference in Australian digital dividend arrangements compared to other Asia Pacific countries):

> ...a decrease in the size of the guard band at the upper boundary of the 700 MHz plan can also be considered in Australia. This would enable additional spectrum to be included in the expansion of the 900 MHz band [in Australia].[16]

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13 FCC, *Public Safety and Homeland Security Bureau: Public Safety/Private Partnership*, available: http://transition.fcc.gov/pshs/public-safety-spectrum/700-MHz/partnership.html (accessed 19 October 2011).

14 DBCDE and ACMA, *Personal communication*, 31 October 2011.

15 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 27.

16 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 28.

800 and 900 MHz spectrum

United States of America

2.21 According to the ACMA, arrangements in some parts of the 800 and 900 MHz bands in the USA 'have some similarities to those in Australia'.[17]

2.22 The 806–824 MHz segment together with 851–869 MHz segment are allocated to the Public Safety Radio Service for emergency dispatch, two-way voice communications, mobile repeaters, interoperability and secondary fixed links.[18] The 824–849 MHz paired with 869–894 MHz segments are used for cellular radiotelephone services in the USA.[19] Above 890 MHz, arrangements in the USA differ from those in Australia. There is no allocation for digital CMTS in the 900 MHz band in the USA.[20] The upper part of the 900 MHz band is used in the US for a variety of services including paging and radiotelephone services, narrowband personal communications services, multiple address services and specialised mobile radio.[21]

Europe

2.23 In Europe, there are similarities with Australian arrangements for the use of the upper part of the 900 MHz band.[22] Australia adopted the global system for mobile communications (GSM) standard from Europe and as a result, the Australian allocation for digital CMTS is the same as that used mostly for GSM in Europe.[23] The use of 915–935 MHz for defence in Europe overlaps with defence use of 915–928 MHz in Australia.[24]

2.24 Use of the rest of the 900 MHz band differs between Europe and Australia. The European digital dividend (790–862 MHz) is substantially different from the

17 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 24.

18 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 24.

19 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

20 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

21 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

22 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

23 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

24 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

Australian digital dividend and overlaps a lower portion of the 900 MHz band.[25] Other uses of the 900 MHz band in Europe include extension of the GSM segments, railway communications and land mobile services.[26]

Asia Pacific

2.25 Parts of the 900 MHz band are being considered by the Asia-Pacific Telecommunity Wireless Group (AWG) for harmonised public protection and disaster relief (PPDR) radiocommunications systems across Region 3 (see discussion in Chapter 1).[27] Specifically, the Asia-Pacific Telecommunity (APT) is considering the 806–824 MHz band together with the 851–869 MHz band:

> ...for harmonised PPDR across some countries in Region 3. These segments are already allocated for PPDR systems in some Region 3 countries, including Korea. The PPDR systems currently used internationally in this segment are based on narrowband technologies. It has been proposed that the AWG also consider developing harmonised plans to enable broadband technologies based on work currently underway in 3GPP.[28]

Spectrum for broadband PPDR radiocommunications in Australia

2.26 During the course of the inquiry, ESOs consistently raised their need for dedicated broadband spectrum particularly as their data requirements continue to increase with technological advances (for example automated number plate recognition and in-field fingerprint identification).[29] The AFP explained '[d]ata communications and the level of traffic every year is growing exponentially'[30], while the NSW Government described the challenges for ESOs using existing commercial networks for data services:

> ...we need access to systems for people, we need access to spectrum for governments so that we can run our radio networks and we need access to spectrum for our data networks as well. Failing that—and you will hear a lot about that discussion around the data services—we need access to dedicated parts of the commercial network because, while the commercial networks

25 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

26 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 25.

27 The International Telecommunication Union (ITU) defines Region 3 as Asia and Australasia.

28 ACMA, *The 900 MHz band—Exploring new opportunities: Initial consultation on future arrangements for the 900 MHz band*, May 2011, p. 34.

29 For example Tasmania Fire Service, *Submission 23*, p. 4; Fire and Emergency Services Agency of Western Australia (FESA), *Submission 18*, p. 4; and NSW Government, *Submission 41*, pp 17–18.

30 Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 3.

> prove very effective, they are prone to congestion and emergency services need to be able to communicate in emergency situations.[31]

2.27 ESOs, however, had mixed views about what spectrum best suited their broadband radiocommunication needs and should therefore be allocated for PPDR. Some ESOs, for example the Fire and Emergency Services Agency of Western Australia (FESA) and the Police Federation of Australia (PFA), recommended allocation of spectrum from the digital dividend.[32] Other ESOs were undecided about whether spectrum in the 700 MHz band or 800 and 900 MHz bands would be preferable, but agreed that dedicated spectrum was required for broadband PPDR radiocommunications.[33]

2.28 A comparison of the 700 MHz band and 800 and 900 MHz bands is below.

2.29 Telecommunications organisations, such as Telstra and the Australian Mobile Telecommunications Association (AMTA), disagreed with the proposition that ESOs required dedicated spectrum for broadband communications and that spectrum for this purpose be allocated from the digital dividend.

2.30 Telstra claimed that a separate mobile network owned and operated by ESOs was:

> ...not the best way of achieving the desired outcome. Instead, it would be more economic and effective to incorporate the ESO requirements into existing commercial mobile networks. Telstra believes that the building of a new mobile network is unnecessary and would be unduly costly.[34]

2.31 Telstra stated its strong opposition to the reservation of digital dividend spectrum for ESOs on the basis:

- it would inhibit the ability of the commercial operators to deliver the full economic potential of the digital dividend spectrum, and the nation would incur an economic loss;
- due to the high costs involved, the high risk that the spectrum would remain largely unused; and

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31 Mr Tony Gates, Director, Operations, Telco Authority, NSW Government, *Proof Committee Hansard*, 8 August 2011, p. 25.

32 FESA, *Submission 18*, p. 4 and Police Federation of Australia (PFA), *Submission 11*, pp7–8.

33 See Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 5 and Mr Tony Gates, Director, Operations, Telco Authority, NSW Government, *Proof Committee Hansard*, 8 August 2011, pp 30–31.

34 Telstra, *Submission 31*, p. 22.

- such a reservation would be unique to Australia and not harmonised with the frequencies that have been identified by the International Telecommunications Union (ITU) for PPDR use across the Asia-Pacific region.[35]

2.32 AMTA concurred.[36] Mr Chris Althaus, Chief Executive Officer of AMTA, argued the best outcome—from a cost-benefit and service delivery perspective—would be for ESOs to partner with the telecommunications industry.[37] Mr Althaus stated:

> ...as an industry we have a community and a social responsibility to respond to the needs of the Australian people during times of crisis, and the partnership with the ESOs is a key feature.
>
> ...
>
> We are the providers of that service who can best provide that. Leave emergency services to what they do best. Running networks and providing communication services is what we do best.[38]

2.33 DBCDE and the ACMA clarified the federal government's proposal to allocate spectrum for broadband PPDR radiocommunications in Australia:

> The frequency range currently proposed to be earmarked for allocation for public safety broadband use in Australia is a portion within the frequency range 805-820 MHz paired with a portion within the frequency 850-870 MHz.
>
> The lower segment (805-820 MHz) will be released as part of Australia's 'digital dividend' band (694-820 MHz) via the switchover from analog to digital television and the relocation – or 'restacking' – of digital broadcasting services out of this band. Legislative amendments passed by the Parliament in May 2011 set a deadline of 31 December 2014 for completion of the restack.
>
> The upper segment (850-870 MHz) is currently used for various services, including point-to-point services and trunked land mobile services. Within this spectrum, 865-870 MHz is currently allocated for trunked land mobile services.
>
> The ACMA has commenced a review of future arrangements for the 800/900 MHz bands, and is empowered to review incumbents' spectrum holdings to relocate existing users under the regulatory framework...The ACMA is expected to release its decision on the revised planning arrangements for the 800/900 MHz bands in the second quarter of 2014, with implementation to commence shortly thereafter. It is expected that any

35 Telstra, *Submission 31*, pp 23–24.

36 Mr Chris Althaus, Australian Mobile Telecommunications Association (AMTA), *Proof Committee Hansard*, 9 August 2011, pp 5–6.

37 Mr Chris Althaus, AMTA, *Proof Committee Hansard*, 9 August 2011, pp 5–6.

38 Mr Chris Althaus, AMTA, *Proof Committee Hansard*, 9 August 2011, p. 6.

> allocation of spectrum from the 800 MHz band for public safety agencies would be available by 2015 – that is, in the same timeframe as the 700 MHz band.
>
> The amount of spectrum needed to deploy the mobile broadband capability sought by public safety agencies will be identified by the ACMA, in consultation with the Public Safety Mobile Broadband Steering Committee. The Steering Committee will work with the ACMA as part of the ACMA's review of the 800/900 MHz band to identify a suitable amount of spectrum necessary to meet foreseeable needs.[39]

2.34 DBCDE re-iterated the federal government's commitment to the development of a 'nationally interoperable mobile broadband capability for public safety agencies' through its participation in the Public Safety Mobile Broadband Steering Committee.[40]

700 MHz band or 800 and 900 MHz bands?

2.35 The PFA claimed the *Radiocommunications Act 1992* (the Act) required the government to make dedicated broadband spectrum available to ESOs because:

> ...it does not say that the Australian Communications and Media Authority must have regard to the needs of law enforcement and defence, for example. It says, "make adequate provision for". This is a very unusual provision, set out in the objects of the act. We believe that, if you accept that mobile broadband communications are part of the need of public safety agencies in the present era, then we believe that "making adequate provision" includes doing so for mobile broadband communications.[41]

2.36 On that basis, the PFA argued strongly for the allocation of spectrum from the 700 MHz band for broadband PPDR radiocommunications:

> The 700 MHz band is special. That is why it is sometimes referred to as 'the waterfront property' of spectrum. It is special because communications in this band can carry large amounts of data, at high speed, over long distances, and can penetrate buildings. It is ideal for mobile broadband services and for emergency and policing services at critical times of national emergency when normal radio and telephone communications are pushed to the limit or severely overloaded past breaking point.
>
> ...
>
> All of Australia's Police Commissioners from every State and Territory and the AFP have agreed that they need 20 MHz (10 +10 MHz paired) of this newly available 700 MHz band to establish a leading edge network for law

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39 Department of Broadband, Communications and the Digital Economy (DBCDE), *Answer to question on notice*, 9 August 2011 (received 2 September 2011).

40 Mr Andrew Maurer, Assistant Secretary, Spectrum and Wireless Services, DBCDE, *Proof Committee Hansard*, 9 August 2011, p. 43.

41 Ms Dianne Gayler, Senior Policy Officer, PFA, *Proof Committee Hansard*, 8 August 2011, p. 11.

> enforcement and emergency services agencies. Premiers have written to Ministers and the Prime Minister supporting a proposal that the Gillard Government reserve 20 MHz for these vital essential services in the national interest. The matter was also raised at the February 2011 meeting of COAG. The Australasian Fire Authorities Council and the Council of Ambulance Authorities are each supporting the proposal.
>
> They are all convinced that it is not prudent or feasible to rely on commercial carriers from which they would buy the necessary communications services. They would essentially be at the mercy of a monopoly commercial carrier as far as price and quality of service are concerned. There are also serious concerns surrounding capacity, redundancy, security and reliability needed for such 'mission critical' purposes. Foreign ownership of such a carrier would jeopardize national security of critical information and communications.[42]

2.37 ANZPAA also advocated for the allocation of 700 MHz spectrum to ESOs. Mr Andrew Scipione, Board Member, ANZPAA outlined the following reasons for preferring the 700 MHz band over the 800 and 900 MHz bands:

- the time it would take to vacate spectrum in the 900 MHz band (re-stacking);
- the availability and cost of equipment for use on spectrum in the 800 and 900 MHz bands; and
- international harmonisation, particularly with Europe and the United Kingdom, and the interoperability of Australian police equipment with other police forces on international missions.[43]

2.38 Other ESOs were undecided about what spectrum should be allocated for broadband PPDR in Australia. The AFP's view was typical of these:

> ...my honest view is that I do not know whether 700 or [800 and 900] is the same or better or worse. I am not a technical expert. I have seen advice from both sides which have different views. I simply do not know. However, I do know that we need one of them, one or the other. As we move forward, law enforcement in particular and emergency services are going to need some sort of high-end broadband to be able to do our job. Situational awareness at the point where an incident occurs for people making command decisions is absolutely imperative. The more information you can get better decisions you will make. Could you imagine what it would have been like in 2003 at the time of the bushfires had we been able to send real live pictures of for example what was happening from our police and emergency officers at the scene back to the command centre. Much higher quality decisions can be made by command with the more information you have. That just stands to reason. While there is the capability to do it in terms of equipment, we still need the mechanism, the ability I suppose, to transmit the information. In

42 PFA, *Submission 11*, pp 7–8.

43 Mr Andrew Scipione, Board Member, ANZPAA, *Proof Committee Hansard*, 9 August 2011, pp 5–6.

> the future there is no doubt that law enforcement and emergency services need some sort of high end bandwidth in the wireless format.[44]

2.39 The NSW Government was equally undecided about whether spectrum from the 700 MHz band or 800 and 900 MHz bands would best suit ESOs' operational needs but agreed that dedicated broadband spectrum was required:

> Clearly we think access to some sort of data spectrum is really critical and there will be lots of people...who will say, 'We have to get access to 700.' There are people saying, 'The demand is too great; we have to look somewhere else.' But the issue..is that we need access to spectrum that meets operational purposes and it needs to be delivered to us in a way which we can afford because not only do we need spectrum but we need to then go off and build networks. The only alternative is to use commercial spectrum and if we are forced to use commercial spectrum then that will raise the issue of how we get reserve capacity in the commercial spectrum so that when my [state and territory] colleagues...are out in the field fighting fires and dealing with floods they actually have the service needed.
>
> ...I do not have a preference per se. If [800 and 900] can deliver the spectrum and it can be delivered commercially through available technology so that we do not have to go out and build new technology and if it can be delivered to meet the needs of emergency services at a reasonable cost I do not have a preference.[45]

2.40 In response to claims made by ESOs regarding the technical differences between spectrum in the 700 MHz band and the 800 and 900 MHz bands, the ACMA stated '[t]he propagation characteristics in 700 and [800 and 900] are identical. In building penetration issues they are exactly the same'.[46]

2.41 As to whether spectrum from the 700 MHz band or the 800 and 900 MHz bands would be best for broadband PPDR radiocommunications, the federal government is considering whether spectrum from the 800 and 900 MHz bands should be allocated for this purpose.[47] It is the government's intention that some of the 700 MHz band will be auctioned (for commercial use) during 2012.[48]

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44 Deputy Commissioner Michael Phelan, Close Operations Support, AFP, *Proof Committee Hansard*, 8 August 2011, p. 5.

45 Mr Tony Gates, Director, Operations, Telco Authority, NSW Government, *Proof Committee Hansard*, 8 August 2011, pp 30–31.

46 Ms Maureen Cahill, General Manager, Communications Infrastructure Division, ACMA, *Proof Committee Hansard*, 9 August 2011, p. 36.

47 Attorney-General's Department, *Public Safety Mobile Broadband Steering Committee: Terms of Reference*, available: www.ag.gov.au/www/agd/agd.nsf/Page/National_security (accessed 19 October 2011), p. 1.

48 ACMA, *Allocation of the 700 MHz (digital dividend) and 2.5 GHz bands*, available: www.acma.gov.au/WEB/STANDARD/pc=PC_312315 (accessed 24 October 2011).

Availability and cost of equipment

2.42 The issue regarding the allocation of spectrum in the 700 MHz band or 800 and 900 MHz bands for broadband PPDR radiocommunications was related to concerns about the relative availability and cost of equipment for use on either the 700 MHz band or 800 and 900 MHz bands.[49] Motorola Solutions explained:

> The relatively small public safety [800 and 900] MHz [long term evolution] market size globally and departure from the Region 3 band plan will limit availability of chipsets and devices for public safety organisations. This will lead to reduced competition and consequential higher prices for products, and lack of advanced features as the technology evolves over future decades.[50]

2.43 ANZPAA and the PFA agreed and argued that allocating spectrum from the 800 and 900 MHz bands for broadband PPDR radiocommunications would mean ESOs incurred greater equipment costs as they would have to pay for purpose-built rather than off-the-shelf equipment.[51]

2.44 ANZPAA went on to concede that the allocation of spectrum for broadband PPDR radiocommunications was a commercial decision for government but indicated that financial support—particularly for equipment costs—would be required from the Commonwealth Government if ESOs were allocated spectrum in the 800 and 900 MHz bands:

> Can I just say that this will be a commercial decision. Clearly, that is the case. We are asking what we believe is for a very small portion of a very lucrative area within the spectrum. We are looking for two times 10 meg slots. I am here today because, as a police officer, we have one thing in mind. That is not to make a profit; we just want to add to the safety and security of our nation.
>
> The fact is that if we are going to have a look at either dealing with an allocation in the [800 and 900] meg area, should that be the decision that is made by government, or, alternatively, buying service, it is going to cost us—and cost us significantly as we become more reliant on this type of technology. If there was some means by which we can be helped as a profession to transition through into the [800 and 900] megahertz area and, if the allocation was made perhaps there is some means by which we can

49 Mr Mark Burgess, Chief Executive Officer, Police Federation of Australia (PFA), *Proof Committee Hansard*, 8 August 2011, p. 8; Mr Andrew Scipione, Board Member, ANZPAA, *Proof Committee Hansard*, 9 August 2011, p. 7.

50 Motorola Solutions, *Supplementary Submission 10*, p. 8.

51 Mr Peter Barrie, Advisor, ANZPAA, *Proof Committee Hansard*, 9 August 2011, p. 8 and Mr Mark Burgess, Chief Executive Officer, PFA, *Proof Committee Hansard*, 8 August 2011, p. 9.

> take some assistance from the Commonwealth to make it, if you like, more achievable.[52]

2.45 In response to the PFA and ANZPAA's claims, the ACMA suggested the use of 800 and 900 MHz spectrum for broadband PPDR radiocommunications would result in lower equipment costs because use of this spectrum for PPDR radiocommunications would be harmonised within the Asia Pacific region:

> ...where we see the growth and the ability for a range of suppliers and equipment is in the fact that these bands will be internationally harmonised for the next generation of mobile technology. We feel that that would provide some great economies of scale for public safety agencies—still with the requirements they have for hardening, which is normally network hardening rather than standards for the handsets—so we do not see that that would be an area that is problematic.[53]

2.46 And:

> We are in region 3, which is the Asia-Pacific and, really, we are looking to standardise probably with China, India, Japan and Korea—countries like those which are large manufacturing countries—so that there is an economy of scale to buy equipment. That is happening in both the 700 and those portions of the 800 that are not yet allocated. Interestingly, those portions of the 800 that we are talking about are immediately adjacent to that Telstra-Voda Next G band and so we would expect those standards just to grow into that band, just as we would expect new standards to come in for the 700 band as well.[54]

Committee view

2.47 As technology advances and the ability to use mobile broadband to inform and support the work of ESOs expands, ESOs' need for broadband spectrum will inevitably increase. In particular, the use of photos, video, maps and other tools will increasingly be relied upon in operational decision-making by ESOs by providing information both to and from "the scene" in real time.

2.48 The committee acknowledges that the capacity for ESOs to use mobile broadband in these ways will better enable ESOs to protect people and property during times of emergency. It is also the committee's view it is preferable to allocate to ESOs dedicated spectrum that is separate from the commercial networks. On this basis, the committee believes that dedicated broadband spectrum should be allocated for PPDR radiocommunications in Australia.

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52 Mr Andrew Scipione, Board Member, ANZPAA, *Proof Committee Hansard*, 9 August 2011, p. 10.

53 Ms Maureen Cahill, General Manager, Communications Infrastructure Division, ACMA, *Proof Committee Hansard*, 9 August 2011, p. 38.

54 Dr Andrew Kerans, Executive Manager, Spectrum Infrastructure Branch, ACMA, *Proof Committee Hansard*, 9 August 2011, p. 37.

2.49 Further, it is the committee's view that the allocation of broadband spectrum for PPDR radiocommunications should provide for interoperability amongst Australian ESOs and with ESO counterparts overseas.

Recommendation 2

2.50 The committee recommends the Commonwealth Government allocate sufficient spectrum for dedicated broadband public protection and disaster relief (PPDR) radiocommunications in Australia.

2.51 The committee further recommends that any allocation of broadband spectrum to emergency service organisations (ESOs) for PPDR must be provided on the basis of interoperability amongst Australian ESOs and with ESO counterparts overseas.

2.52 However, the committee does not have the technical expertise to recommend whether this spectrum should be in the 700 MHz band or 800 and 900 MHz bands. The committee notes that DBCDE, the ACMA and the Attorney-General's Department are currently engaged in processes examining this question.

2.53 The committee strongly encourages stakeholders participating in the Public Safety Mobile Broadband Steering Committee and the ACMA's review of the 900 MHz band to critically examine the benefits and weaknesses of using spectrum in the 800 and 900 MHz bands for broadband PPDR radiocommunications in Australia. The Commonwealth Government together with state and territory governments should, in collaboration with ESOs, develop strategies to address any identified weaknesses associated with the use of the 800 and 900 MHz bands for broadband PPDR prior to implementing a decision to use this spectrum for this purpose.

2.54 Further, the committee notes the concerns raised by some submitters regarding the availability and cost of equipment for use in 800 and 900 MHz spectrum. The committee suggests that the availability and cost of equipment for use by ESOs is explicitly considered by the Public Safety Mobile Broadband Steering Committee as part of its deliberations.

Chapter 3

Emergency warnings and community preparedness

3.1 The use of emergency warnings, as well as community preparedness for and responsibility in times of emergency, were discussed during the course of the inquiry.

3.2 The committee heard about current systems for warning the community about emergencies, for example warnings broadcast via radio and television as well as SMS and telephone alerts. Subsequently, the use of "informal sources" such as social media to distribute emergency information was raised, as were warning systems used overseas and devices designed specifically for the dissemination of emergency alerts.

3.3 The dissemination of emergency warnings and information to people with a disability, as well as emergency telecommunication arrangements for people with a disability were highlighted by a consumer group as specific concerns.

3.4 The committee was also informed about the importance of community preparedness and responsibility, and the role these play in determining how effectively a community responds to and recovers from an emergency.

Emergency warnings

3.5 The use of emergency warnings in Australia, and the importance Australians place on these, was raised by numerous submitters throughout the inquiry.

3.6 For example, the Australian Psychological Society emphasised the importance of well-crafted emergency warnings, and the trust the community places in such warnings:

> Regarding trust, along both the formal and informal channels of communication, it is more likely for people to get an initial warning via an informal channel, but often they will then move to a more formal channel to try to verify some information—they will turn on the radio, the television or go to a website. The more that there is what the research calls 'source certainty' around a warning message the more likely it is to be taken up. In other words, the more there is trust in that source of information the more likely it is going to happen. I might add that it is not just trust in terms of the interface between the warning disseminator and the public; it is also between those who are behind the scenes and who are intended to be cooperating to produce a well crafted warning message.[1]

3.7 The dissemination of emergency warnings through traditional channels (radio, television and telephone alerts) and increasingly via informal channels, for example

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1 Professor Kevin Ronan, Chair, Disaster Reference Group, Australian Psychological Society, *Proof Committee Hansard,* 8 August 2011, p. 39.

social media, is discussed below. Emergency alert systems used overseas, devices designed specifically to deliver emergency alerts as well as emergency warnings and telecommunications arrangements for people with a disability are also discussed in the following sections.

Radio and television broadcasts

3.8 Emergency warnings are routinely broadcast by both public and commercial radio and television stations in Australia.

3.9 The Australian Broadcasting Corporation (ABC) described radio and television as 'very effective methods of communicating important information to large groups of people before, during and after emergency situations'.[2] The committee was informed by the public broadcaster that:

> There is no legislative requirement for the ABC to broadcast warnings, nor is the Corporation provided with any funding to assist with disaster coverage. However, there are strong audience expectations that the ABC will provide such services. It is well-recognised that listening to ABC radio services leaps during emergency periods, as there is very high community recognition of the ABC's role in providing timely and accurate information. Research into emergency broadcasting has shown that listeners are inclined to seek out trusted local personalities and stay with them for the duration of the event.[3]

3.10 The importance of emergency warnings broadcast by local radio was emphasised by the ABC: 'Local radio services are particularly effective, as broadcasters have established relationships with local communities and detailed local knowledge that may assist listeners'.[4] The ABC went on to describe its '60 local radio stations throughout regional and metropolitan Australia' as the 'primary platform for emergency broadcasting'.[5]

3.11 Similarly, Commercial Radio Australia (CRA) outlined the reach and penetration of its '260 member stations' of which '220 are based in regional and rural areas':

> These stations strive to achieve community engagement through a focus on local issues. Accordingly, the industry is very well placed to understand the needs of local communities and to communicate effectively with them during emergencies.[6]

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2 Australian Broadcasting Corporation (ABC), *Submission 35*, p. 1.

3 ABC, *Submission 35*, p. 1.

4 ABC, *Submission 35*, p. 1.

5 ABC, *Submission 35*, p. 1.

6 Commercial Radio Australia (CRA), *Submission 14*, p. 3.

3.12 CRA cited several examples of the effectiveness of local commercial radio stations during various recent natural disasters.[7]

3.13 The committee was informed by CRA that the Commercial Radio Code of Practice requires commercial radio stations to:

> ...in consultation with appropriate emergency and essential service organizations, implement a set of internal procedures to enable the timely and accurate broadcast of warnings and information supplied by such organizations relating to an existing or threatened emergency.
>
> All commercial radio stations are bound by this Code.[8]

3.14 In addition to the code of conduct described by CRA, both the ABC and CRA have entered in agreements with various state and territory ESOs to establish the parameters of their relationships for the purposes of broadcasting emergency warnings.

3.15 Consistent with a recommendation in the Council of Australian Governments (COAG) 2005 National Inquiry on Bushfire Mitigation and Management, the ABC has memoranda of understanding (MOUs) or partnerships with ESOs in all states and territories that 'commit the Corporation to use its best endeavours to provide emergency warnings and working to help emergency service agencies'.[9] These MOUs are reviewed regularly.[10]

3.16 CRA entered into an MOU with the Victorian government following the Black Saturday fires in 2009. At present, CRA has 'entered into MoUs in New South Wales, South Australia and Queensland, and an MoU is currently being negotiated in Tasmania'.[11] Western Australia is the only state with which the commercial radio industry does not have an MOU.[12]

3.17 By way of example, CRA provided the committee with a copy of the MOU with the Victorian government.[13] The MOU 'constitutes an arrangement between the Coordinator-in-Chief and Commercial Radio Australia to facilitate the broadcasting of

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7 CRA, *Submission 14*, pp 3–7. For example the Victorian bushfires, Queensland floods and Cyclone Yasi.

8 CRA, *Submission 14*, p. 2.

9 ABC, *Submission 35*, p. 2.

10 ABC, *Submission 35*, p. 2.

11 CRA, *Submission 14*, p. 3.

12 CRA, *Submission 14*, p. 3.

13 CRA, *Memorandum of Understanding: Procedures for broadcasting of emergency information by Commercial Broadcasters in Victoria*, October 2009.

emergency information and warnings during emergency events'[14] and includes (but is not limited to) the following provisions:

- co-operation and consultation between the parties;
- the broadcast of emergency warnings in a timely manner and in a form agreed by the relevant ESO;
- an undertaking by commercial broadcasters to break into programming in order to broadcast an emergency warning;
- the use of the standard emergency warning signal (SEWS) as requested by the relevant ESO;
- the availability of commercial radio broadcasters to broadcast emergency warnings 24 hours a day, seven days a week, 365 days of the year;
- the contact mechanism between commercial broadcasters and ESOs in the event of an emergency;
- the provision of emergency information and warnings by ESOs to commercial broadcasters in a timely and accurate fashion; and
- in collaboration with one another, the identification of critical infrastructure necessary for the broadcast of emergency information that could require protection during emergency events.[15]

3.18 Of the MOUs, Ms Joan Warner, Chief Executive Officer of CRA, stated:

> We think the MOUs are working pretty well. We are pretty pleased with them. We have had to be proactive and we are still working on WA and Tasmania, but we think we will get there. Victoria has been the most engaged. It had the royal commission and had a lot of criticism made of its communications processes. The MOUs are very helpful to us and it is about educating our local radio station personnel so they know, yes, we have a code and "Here are a whole lot of processes that you now need to follow every year".[16]

3.19 During the course of the inquiry, CRA made several recommendations intended to increase awareness about the role of commercial radio broadcasters in an emergency and to further improve relationships between the commercial radio industry and ESOs. Ms Warner explained:

> Our first one is that commercial radio's role be highlighted in any publicity around emergencies or from emergency services—that we do not hear ever

14 CRA, *Memorandum of Understanding: Procedures for broadcasting of emergency information by Commercial Broadcasters in Victoria*, October 2009, p. 2.

15 CRA, *Memorandum of Understanding: Procedures for broadcasting of emergency information by Commercial Broadcasters in Victoria*, October 2009, pp 4–6.

16 Ms Joan Warner, Chief Executive Officer, CRA, *Proof Committee Hansard*, 8 August 2011, p. 65.

> again that the ABC is the official emergency services broadcaster, when the ABC may be off air and you have got your local commercial station broadcasting and most people are listening to that.
>
> Our other suggestion, which we have made a few times in dealing with state governments, is that there is a designated person who will always take calls from whatever media, whether it is local commercial radio or the ABC or Channel 7, and that that person—or two people—is always available. Sometimes our members find that they will call and the person that they spoke to two hours ago is not there...there needs to be a really clear communication protocol and one or two identified spokespeople who will always give the latest information to the media when they call, or who are willing to do a few grabs and have them on a website so that people could go to a website and take the latest grab from the emergency services commissioner, who did it one minute ago...The other thing is that we would like to actually know who is coordinating a disaster or an emergency. I think we flagged it in our submission that, in some instances, some of our broadcasters were told to play the emergency warning—and of course people really spring to action when they hear the siren—and then they were contacted a little bit later by another department saying: 'What on earth are you doing playing that warning? Don't play it.' I think sometimes it is just knowing who is the peak body. Who do you talk to in the bushfires? Is it the fire brigade and you do not pay any attention to anyone else? In a terrorism situation, is it the Federal Police or is it the state police?[17]

3.20 In addition to commercial radio, FreeTV Australia informed the committee that free-to-air commercial television broadcasters had also played a role in the dissemination of warnings and emergency information during recent natural disasters such as the Victorian bushfires and Cyclone Yasi.[18]

3.21 Ms Julie Flynn, Chief Executive Officer of FreeTV Australia outlined the industry's code that requires free-to-air commercial television stations to broadcast emergency warnings:

> [The national processes for cooperation between emergency management services and all media sectors] are backed up by a range of regulatory requirements designed to ensure the timely and accurate broadcast of emergency information to their licensee's local community, and all free-to-air commercial broadcasters comply with these requirements at a minimum. There are requirements in the industry's code of practice which ensure licensees have adequate procedures in place to enable prompt and accurate broadcast of emergency information. The code includes requirements to consult with emergency and essential service organisations within their licensed area and to implement internal procedures to enable the

17 Ms Joan Warner, Chief Executive Officer, CRA, *Proof Committee Hansard*, 8 August 2011, pp 61–62.

18 Ms Julie Flynn, Chief Executive Officer, FreeTV Australia, *Proof Committee Hansard*, 8 August 2011, pp 50–51.

> dissemination of emergency information. The code also includes an appendix dealing specifically with the broadcast of emergency information, providing further guidance to licensees on their responsibilities and the need to develop and maintain effective lines of communication with emergency service organisations.[19]

3.22 FreeTV Australia shared CRA's concern regarding the availability and maintenance of up-to-date contact details for both emergency personnel and broadcasters that can be used during an emergency. Ms Flynn recommended a national database:

> One of the issues that I have discussed with the Attorney-General's process is having an adequate list, a database—and we can do that now—of who all these emergency services people are and who the contacts are at the broadcaster. A database of that kind could be set up and established—and I know for a fact that we went through all of this here in the press gallery back in the early nineties when we had the first Gulf War. The defence department was establishing contacts so that when something happened there was a process and you could get in touch. You had a known person in the newsroom; you had a known person at the defence department. The same applies with emergency services.
>
> What happens over time is that Joe Bloggs moves on and Mary Jane comes in to replace him, at either end, and nobody knows that the change has been made. The information is stored in someone's brain. That person moves on and the information is lost. It may be written down somewhere. There may be some sort of process, and there usually are manuals in newsrooms about these things. But a database that the states contributed to, that the Commonwealth contributed to and that broadcasters of all kinds contributed to I think would solve a lot of the issues that you are concerned about. If you know that I am sitting on the other end of the phone and that my telephone number is XYZ and you can ring me 24/7, you are going to pick up the phone and ring me and I am going to answer it.[20]

Telephone and SMS warnings

3.23 Australia's emergency alert system, "Emergency Alert", was launched in December 2009 and enables state and territory emergency service organisations (ESOs) to issue telephone-based warnings to both landline and mobile telephones.[21] The Commonwealth Government provided $15 million for the development of Emergency Alert; participating states and territories (ACT, NSW, Northern Territory,

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19 Ms Julie Flynn, Chief Executive Officer, FreeTV Australia, *Proof Committee Hansard*, 8 August 2011, p. 50.

20 Ms Julie Flynn, Chief Executive Officer, FreeTV Australia, *Proof Committee Hansard*, 8 August 2011, p. 52.

21 Attorney-General's Department, *Submission 24*, p. 10.

South Australia, Tasmania, Victoria and Queensland)[22] are responsible for the ongoing operational and usage costs associated with Emergency Alert.[23]

3.24 Emergency Alert delivers warnings to telephones linked to properties in an area identified as being at risk.[24] The location of the telephone to which the emergency warning is sent is determined using the address associated with the account for that telephone, that is, Emergency Alert does not determine the physical location of the handset.[25]

3.25 Since Emergency Alert became operational it has been used 330 times and issued approximately 7.12 million messages.[26] The system has been used in NSW, Victoria, South Australia, Queensland, the Northern Territory and the ACT for a range of emergencies including storm, flood, tsunami, bushfire, storm surge, chemical incident and missing person emergencies.[27]

3.26 Telstra currently provides the systems for Emergency Alert.[28] Telstra explained:

> The Emergency Alert solution was designed in accordance with the Solution Requirements specified by Victoria in consultation with the participating States and Territories. Telstra provides a managed service and continues to work closely with government agencies to ensure that Emergency Alert is a fully robust system that meets the operational needs of the users. The system is expected to be continually enhanced as the expertise of users and their requirements increase.[29]

3.27 The decision to issue an emergency alert, as well as the content of each alert and the geographic area where an alert is sent, is determined by state and territory ESOs.[30]

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22 Western Australia uses a state-based telephone alert system, "StateAlert".

23 Attorney-General's Department, *Submission 24*, p. 10 and Emergency Alert, *Frequently asked questions*, available: www.emergencyalert.gov.au/frequently-asked-questions.html (accessed 20 October 2011).

24 Attorney-General's Department, *Submission 24*, p. 10.

25 Mr Anthony Goonan, Director, Network and Commercial Planning, Telstra, *Proof Committee Hansard*, 8 August 2011, p. 71.

26 Emergency Alert, *Frequently asked questions: What is emergency alert?*, available: www.emergencyalert.gov.au/frequently-asked-questions.html (accessed 20 October 2011).

27 Emergency Alert, *Frequently asked questions: What is emergency alert?*, available: www.emergencyalert.gov.au/frequently-asked-questions.html (accessed 20 October 2011).

28 Telstra, *Submission 31*, p. 5.

29 Telstra, *Submission 31*, pp 8–9.

30 Telstra, *Submission 31*, p. 8.

3.28 Numerous other submitters were critical of Emergency Alert: the absence of a capacity to determine the location of telephone handsets in the alert area, as well as the need for certain telephone handsets (cordless landline telephones and mobile telephones) to have access to power and be turned on in order to receive an alert were of specific concern.[31] This led to discussion of location-based mobile telephone emergency alerts as well as other systems and technologies used to issue emergency alerts.

Location-based mobile telephone emergency warning capability

3.29 As discussed above, Emergency Alert does not have the capability to issue warnings to telephone handsets (specifically mobile phones) on the basis of the physical location of the handset at the time of an emergency, rather than the customer's registered service address.

3.30 On 16 September 2011 and during the course of the inquiry, Emergency Alert was used in the ACT to alert residents in some northern Canberra suburbs to a toxic chemical fire.[32] Many Canberrans in the affected area 'complained...they had not received the early-morning warning to stay inside, despite living in nearby suburbs...Others received a text message even though they were interstate or overseas'.[33] This demonstrated some of the difficulties associated with the lack of a location-based mobile telephone emergency warning capability. However, it is also important to note that some of the problems associated with the use of Emergency Alert for the chemical fire arose because the ACT government did not use Emergency Alert in accordance with the 'Recommended Use Guidelines'.[34]

3.31 The NSW State Emergency Service (SES), the Local Government Association of Queensland (LGAQ), Lake Macquarie City Council, Mr David Tones and Mr Kim Allen were among those who identified the absence of a capacity to issue warnings based on the physical location of a handset as a major weakness of Emergency Alert.[35] Submitters argued this weakness needed to be addressed so that people 'in the

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31 See for example Professor Stephen Robson and Mr David Templeman, *Supplementary Submission 1*, p. 1; NSW State Emergency Service (SES), *Submission 17*, p. 6; Local Government Association of Queensland (LGAQ), *Submission 22*, p. 1; Lake Macquarie City Council, *Submission 26*, p. 3; Mr David Tones, *Submission 27*, pp 7–8 and Mr Kim Allen, *Submission 37*, p. 4.

32 Markus Manheim, 'Staying in the loop a key to emergency texts', *The Canberra Times*, 22 September 2011.

33 Markus Manheim, 'Staying in the loop a key to emergency texts', *The Canberra Times*, 22 September 2011.

34 Senator the Hon Joe Ludwig, Minister representing the Attorney-General, *Answer to Senate Question 1434*, 8 November 2011 (received 21 November 2011), available: www.aph.gov.au/hansard/senate/dailys/ds221111.pdf (accessed 23 November 2011).

35 NSW SES, *Submission 17*, p. 6; LGAQ, *Submission 22*, p. 1; Lake Macquarie City Council, *Submission 26*, p. 3; Mr David Tones, *Submission 27*, pp 7–8 and Mr Kim Allen, *Submission 37*, p. 4.

foot print of an emergency'[36] receive 'reliable, timely early warning alerts to enable them to prepare for and respond to natural disasters and other emergencies'.[37]

3.32 The governments of NSW, South Australia and the Northern Territory also discussed some of the limitations of the Emergency Alert system in this regard[38] but recognised that a telephone emergency alert system is one tool amongst a suite of tools that should be used to alert members of the community. Mr Bruce McDonald, Chief Superintendent of the NSW Rural Fire Service stated:

> The Emergency Alert system has two functions. It dials landline telephones based on the service address—that is, the address that the telephone was physically connected to. That is reasonably successful. For mobile phones it is based on the billing address which for me would be my organisation and not my residence. Some of the limitations are that unless the alerting polygon is drawn around the business address, I will not get a message no matter where I am.
>
> As an organisation we have only used Emergency Alert on two occasions. It has had reasonable success, but we also believe that Emergency Alert is not the panacea to all ills. There needs to be a mixture of Facebook, Twitter, local media, community doorknocking, community meetings et cetera. Our experience has shown that different solutions work differently in different communities. You cannot take one of the suite of tools and isolate it. You must use all of the tools and whatever is appropriate for the best community outcome.[39]

3.33 The National Council on Intellectual Disability (NCID) agreed that telephone warning systems such as Emergency Alert must not be the sole mechanism by which people are alerted to an emergency, but must be used in the context of the ability of people with an intellectual disability to receive and respond to such an alert.[40] NCID was concerned about people with an intellectual disability physically receiving an emergency alert, understanding the alert and taking appropriate action in response to an alert.[41] To address these concerns, NCID emphasised the need for direct contact with people with an intellectual disability, including door knocking:

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36 NSW SES, *Submission 17*, p. 6.

37 Lake Macquarie City Council, *Submission 26*, p. 1.

38 Mr Tony Gates, Director, Operations, NSW Telco Authority, *Proof Committee Hansard*, 8 August 2011, pp 24–25; Mr Peter Davies, Directory NT Emergency Service, *Proof Committee Hansard*, 8 August 2011, p. 25 and Mr David Place, Chief Executive, South Australian Fire and Emergency Services Commission (SAFECOM), *Proof Committee Hansard*, 8 August 2011, p. 26.

39 Mr Bruce McDonald, Chief Superintendent, NSW Rural Fire Service, *Proof Committee Hansard*, 8 August 2011, p. 25. Please note, Emergency Alert contacts the registered service address–and not the billing address–for both mobile telephones and landline telephones.

40 National Council on Intellectual Disability (NCID), *Submission 43*, pp 6–8.

41 NCID, *Submission 43*, pp 6–7.

> During an emergency or natural disaster a common way in which people are advised of safety concerns, including the need to evacuate, is through **door knocking**. There are important issues with this that must be considered:
>
> - **this is a good way to have personal contact with people and to ensure that the situation and what people should do is understood by the person with intellectual disability, but,**
> - for some people it may be difficult to stay calm, anyone approaching their door may have to spend some time both calming the person and making sure that the person understands what the situation is and what is expected of them.
> - some people will not open their door to strangers ("use neighbours if this happens")
> - some people do not trust people (even if they see them regularly) in uncertain or stressful situations – they have a history of being treated badly by people in authority ("the door knocker should wear a uniform with an id badge)
>
> Training in disability awareness and communication strategies for emergency service personnel could also be included in emergency planning. For example, in NSW the Intellectual Disability Rights Service conducts education sessions for Police; this is delivered by trainers with intellectual disability.[42]

3.34 With respect to community satisfaction with Emergency Alert, a recent evaluation conducted by the Torrens Resilience Institute, commissioned by the South Australian Fire and Emergency Services Commission (SAFECOM) and funded by the Commonwealth Government, surveyed householders to ascertain the level of satisfaction with the telephone warning system. The survey found that:

- 83 per cent of people received emergency alerts;
- of those who received alerts, 98 per cent said the alert was delivered in full and 97 per cent said the alert was clear;
- 84 per cent of people understood and acted upon the emergency alert;
- on receiving an alert, approximately 87 per cent of people said they would seek further information; and
- 84 per cent said Emergency Alert fully met or exceeded their expectations.[43]

3.35 The Attorney-General's Department informed the committee:

> No emergency warning mechanism is guaranteed to deliver warnings to all people in a given area at a given point in time. Thus it is critical that no

42 NCID, *Submission 43*, p. 8, emphasis in original.

43 Torrens Resilience Institute, *Assessment of the Effectiveness of Emergency Alert: Final Report*, 30 July 2011, p. 3.

> single mode of warning or communication is relied upon solely, in times of emergency – either by the public to receive warnings, or by warning agencies to disseminate them. States and territories have a suite of delivery mechanisms at their disposal that they may use to issue warnings.[44]

3.36 The Attorney-General's Department went on to explain that a location-based mobile phone emergency alert capability was currently being explored by the Commonwealth Government in conjunction with the states and territories:

> The Commonwealth funding for the development of the national telephone-based emergency warning capability also provided $1.35 million for research into the feasibility of developing a location-based mobile telephone emergency warning capability. This capability would issue warnings to mobile telephones based on the physical location of the handset at the time of an emergency, rather than the customer's registered service address.
>
> Once this research confirmed that development of a location-based mobile warning capability was technically feasible, on 14 September 2010, the Prime Minister, the Hon Julia Gillard MP and the Attorney-General jointly announced that the Commonwealth would assist the States and Territories to fund the establishment costs associated with the development of the capability as an enhancement to Emergency Alert and State Alert. As the States and Territories will own and operate this capability in their capacity as first responders, the Commonwealth does not have a direct role in the procurement. This process is being led by Victoria on behalf of the States and Territories.
>
> The timing of the deployment of the location-based mobile telephone emergency warning capability is subject to negotiations with each of the three national mobile telecommunications carriers.[45]

Use of other technologies to issue emergency warnings

3.37 As discussed above, it was recognised by various submitters to the inquiry, including state and territory governments, that existing systems for issuing emergency alerts—such as Emergency Alert—have limitations and are only part of the solution in ensuring the delivery of timely, accurate and effective warnings in an emergency situation. As a result, various submitters raised the use of other technologies such as the internet and social media as well as devices specifically designed to alert people to an emergency situation.

The internet and social media

3.38 Mr David Place, Chief Executive, South Australian Fire and Emergency Services Commission (SAFECOM) reflected on the increasing use of 'more informal processes...because [the public] are craving that information and they are not getting it

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44 Attorney-General's Department, *Submission 24*, p. 5.

45 Attorney-General's Department, *Submission 24*, p. 11.

through the formal channels'.[46] In response to the public's desire to access information through "informal" means, the governments of South Australia,[47] Western Australia[48] and Tasmania[49] informed the committee they were examining the use of the internet and social media to deliver emergency information and warnings.

3.39 The Bureau of Meteorology explained its increasing use of the internet to provide weather information and warnings.[50] The Bureau informed the committee that a recent market survey, conducted in December 2010, had shown:

> ...around 53% of respondents had used the Bureau's website in the past 6 months. Of these respondents, 35% indicated that the Bureau's website was their most valued source of weather information. Knowledge of the Bureau's website is steadily increasing with just 15% of respondents unaware of the Bureau's website in December 2010, compared with 20% who were unaware of the site in a separate survey conducted in winter 2009.[51]

3.40 The Bureau also informed the committee that it had recently commenced use of Really Simple Syndication (RSS) feeds that allow people to subscribe to warning information. The Bureau explained the RSS service 'alerts users to the presence of new warning data when it is issued, provided they have a web browser open on their devices'.[52]

3.41 The NSW Government acknowledged the opportunities to disseminate information using the internet and social media but flagged that care was needed in the use of these:

> It is not just copper, it is optic fibre, it is microwave, there is Twitter, there is Facebook and the internet. There is a whole range of technologies so that we have the choice of a lot more and we have to be very careful about their availability and how we use them.
>
> ...
>
> There has been a lot of focus on alternative technologies, particularly the alerting system. We see that as really important, but we have to remember that not all parts of Australia and not everybody is internet savvy or has a mobile phone. There is still a really important role for the traditional ways of getting to people: radio and television; and telling people through

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46 Mr David Place, Chief Executive, SAFECOM, *Proof Committee Hansard*, 8 August 2011, p. 26.

47 Government of South Australia, *Submission 9*, p. 5.

48 Fire and Emergency Services Authority of Western Australia (FESA), *Submission 18*, pp 4–5.

49 Tasmanian Government, *Submission 39*, p. 4.

50 Bureau of Meteorology, *Submission 42*, p. 8.

51 Bureau of Meteorology, *Submission 42*, p. 8.

52 Bureau of Meteorology, *Submission 42*, p. 9.

> education systems to have a battery driven commercial radio and to know who to listen to is really important.[53]

3.42 Similarly, the Australian Psychological Society raised the risk of misinformation about an emergency being spread 'between friendship networks or informal networks' on 'public source applications'.[54] The Psychological Society believed these risks could be minimised by making available 'up-to-date accurate quality information...distributed from reliable authoritative sources so that there is a possibility that people can be cross-checking their information'.[55]

3.43 The Attorney-General's Department expressed the federal government's support for the use of a variety of mechanisms to issue emergency warnings, including the use of the internet and social media:

> States and territories have a suite of delivery mechanisms at their disposal that they may use to issue warnings. These range from more traditional methods such as television and radio broadcast, community meetings and loud hailers to utilising the latest technology, such as mobile texting and social networking tools.
>
> All Australian governments are supportive of a multi-modal approach to issuing emergency warnings. Adopting such an approach to warning the community is crucial in the event of critical infrastructure failure and also for reasons of saturation and accessibility. It maximises the likelihood that as many people as possible receive and comprehend a warning regardless of the activity they are involved in or the mode of communication they are reliant on or prefer. This in turn makes it more likely that people will be in a position to take appropriate action to protect against loss of life, or injury, and mitigate against damage to property.[56]

Devices

3.44 In response to criticisms of Emergency Alert, and the requirement for televisions, radios and mobile phones to be turned on, and in the case of televisions and cordless landline phones to be connected to mains or generator power in order to receive an emergency warning, the committee was made aware of several technologies that may overcome some of these problems.

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53 Mr Tony Gates, Director, NSW Telco Authority, *Proof Committee Hansard*, 8 August 2011, p. 24.

54 Dr Susie Burke, Senior Psychologist, Public Interest, Disasters and the Environment, Australian Psychological Society, *Proof Committee Hansard*, 8 August 2011, p. 36.

55 Dr Susie Burke, Senior Psychologist, Public Interest, Disasters and the Environment, Australian Psychological Society, *Proof Committee Hansard*, 8 August 2011, p. 36.

56 Attorney-General's Department, *Submission 24*, p. 5.

3.45 An example of the importance of an emergency alert capacity that wakes people at night and / or turns on the device to deliver a warning was provided by the Northern Territory government:

> I note with SMSs, they do not wake people up at night. One of the big weaknesses in the whole system at the moment is if a tsunami comes in after dark then there is a very good likelihood that we will not be able to wake people up and alert them to move. This is probably one of the bigger holes in our alerting system as we speak.[57]

3.46 Both the Special Broadcasting Service (SBS) and the Australian Broadcasting Corporation (ABC) cited the emergency alert system used in Japan. Mr Hugh James, Manager, Transmission Services, SBS and Dr David Sutton, Head of Strategic Policy, ABC described the Japanese model and some possible implications for Australia:

> In the recent Japanese earthquake and tsunami, the relatively low death toll was a testament to the work done particularly by the Japanese broadcasters on developing an emergency warning system that is now built into their radios. The radio sits there, off, and given the tsunami it comes to life and broadcasts the warning. That is now being put out across South-East Asia, and Australia should take note of that for the future.[58]

And:

> **Mr James:** It has been developed by the Asian broadcasting union, particularly in conjunction with the Japanese broadcasters. They established it as a standard about two years ago. The Japanese have been using an earlier version of it for some years. My only concern about implementing it in Australia would be that it probably adds a few dollars to the cost of a radio, but given that we are moving to digital radios anyway a few dollars on $100 is relatively small.
>
> **Dr Sutton:** While I am not exactly a technician I had an explanation of it when I visited the NHK [Japan Broadcasting Corporation] labs in Tokyo. Essentially it requires a very thin sliver of broadcasting spectrum to carry a signal that is able to wake up the device. You then need to have the necessary chip set in the device to respond to that signal. It would add a cost and would have to be effectively inserted into radios across the country, so there would be a fairly substantial replacement that would be required.[59]

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57 Mr Peter Davies, Director, NT Emergency Service, *Proof Committee Hansard*, 8 August 2011, p. 25.

58 Mr Hugh James, Manager, Transmission Services, Special Broadcasting Service (SBS), *Proof Committee Hansard*, 8 August 2011, p. 43.

59 Mr Hugh James, Manager, Transmission Services, SBS and Dr David Sutton, Head of Strategic Policy, Australian Broadcasting Corporation (ABC), *Proof Committee Hansard*, 8 August 2011, p. 44.

3.47 The committee also heard about technologies developed in Australia, including:

- Sentinel Alert—a dedicated public emergency warning system that delivers via satellite and VHF channels, and within minutes of initiation of an alert, an audible, visual and text warning to a receiver unit that can be installed in homes;[60] and
- YellowBird Automatic Linking to Emergency Radio Transmissions (ALERT)—a method (software and microchip) of using existing radio broadcast infrastructure to remotely switch on radios, and other mobile devices, in the event of an emergency to deliver emergency warnings.[61]

3.48 Both Sentinel Alert and YellowBird ALERT utilise location-based emergency warning capability to deliver emergency alerts to people in the footprint of an emergency.

Emergency warnings and telecommunication arrangements for people with a disability

3.49 The arrangements for people with a disability during times of emergency, including the impact of an emergency on communication services for people with a disability as well as emergency warning and evacuation procedures for people with a disability, were the subject of discussion during the course of the inquiry.

3.50 The Australian Communications Consumer Action Network (ACCAN) was particularly concerned about 'the accessibility of emergency call services and emergency information to people with disability' and the difficulties encountered in this regard by people with a disability during the 2010-11 Queensland floods.[62] Ms Danielle Fried, Disability Policy Advisor for ACCAN described disruptions to the National Relay Service (NRS) as a result of the Queensland floods:

> ...the flood affected the operations of the Australian Communication Exchange, including the National Relay Service, or NRS—a phone solution for people who are deaf, hearing impaired or speech impaired. Staff were unable to reach or work safely at the call centre, which is in Brisbane. The NRS worked closely with Telstra and the ACMA to ensure that emergency calls via the 106 emergency number could continue, and this meant that people with disability who use a TTY—a specialised telephone with a keyboard—were still able to make emergency calls. However, other people with disabilities throughout Australia—those who rely on the National Relay Service's Speak and Listen and internet relay services and the Australian Communication Exchange's video relay and caption telephony

60 Sentinel Alert, *Submission 8*, p. 2.

61 Professor Stephen Robson and Mr David Templeman, *Submission 1*, p. 9.

62 Ms Danielle Fried, Disability Policy Advisor, Australian Communications Consumer Action Network (ACCAN), *Proof Committee Hansard*, 8 August 2011, p. 15.

> services—were not able to make emergency calls for around 24 hours. All NRS users throughout the country were not able to make calls to the SES either throughout this period.[63]

3.51 ACCAN praised the work of the ACMA and Telstra for working 'in difficult circumstances' to 'ensure that the 106 service remained available throughout the almost 24 hours that other NRS call types were offline' for people who are deaf, hearing-impaired or speech-impaired and who use a teletypewriter (TTY) to make calls to emergency services.[64] ACCAN was very concerned, however, that "Speak and Listen" and internet relay users were unable 'to call emergency services at all during this period'.[65]

3.52 To address the disruption to emergency call services for Speak and Listen and internet relay users, ACCAN recommended the ACMA ensure that:

- The National Relay Service (NRS) emergency site is in a location which is less prone to floods (or other risks)
- Users of the NRS's internet relay and Speak and Listen services have guaranteed access to 000 at all times
- Users of ACE's Video Relay and captioned telephony services have guaranteed access to 000 and that these services are incorporated into the legal framework for emergency calls
- Greater legal and regulatory obligations are required of the 106 Emergency Call Person (ECP), in order to provide stronger protections for consumers
- Emergency service organisations can call back all 000 or 106 users, regardless of the method initially used to make contact.[66]

3.53 At its meeting inaugural on 11 November 2011, the Standing Council on Police and Emergency Management (SCPEM) agreed to implement improvements to Triple Zero emergency call services[67] including:

- the adoption of national phone numbers for State Emergency Services and police assistance;
- the development of national standardised qualifications for Triple Zero call takers;

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63 Ms Danielle Fried, Disability Policy Advisor, ACCAN, *Proof Committee Hansard*, 8 August 2011, p. 15.

64 ACCAN, *Submission 4*, p. 9.

65 ACCAN, *Submission 4*, p. 9.

66 ACCAN, *Submission 4*, p. 6.

67 The Hon Robert McClelland MP, Attorney-General, 'Strengthening triple zero services during a disaster', media release, 11 November 2011.

- the introduction of recorded voice announcements (RVAs) directing people who have called Triple Zero to call state or territory emergency services, or police assistance if they do not require urgent assistance from police, fire or ambulance; and
- examining the establishment of an "all hazards" emergency information hotline to provide a single number to call about information for floods, bushfire and other serious events.[68]

3.54 However, SCPEM did not undertake to make changes to Triple Zero call services for people with a disability.

3.55 ACCAN also raised access to emergency information for people with a disability. Ms Fried cited the use of an Australian sign language (Auslan) interpreter by the Queensland state government during the 2010–11 floods as an example:

> During the floods, we saw the Queensland government take the welcome decision to provide Auslan interpretation for the deaf community at emergency related media conferences. Unfortunately some TV networks initially chose to cut the interpreter out of their broadcast. ACCAN would like to see all state emergency communication strategies include Auslan-English interpreters in public broadcasts and all broadcasters include the interpretation on air. Broadcast emergency information also needs to be open captioned, and any written information on the screen, such as scrolling ticker tape or emergency phone numbers, has to be read out audibly so that viewers who are blind or vision impaired have access to this important information.[69]

3.56 ACCAN wanted to see the routine use of Auslan interpreters and envisaged a two part strategy to bring this to fruition:

- the provision of Auslan interpretation as part of emergency plan strategies at the local, state and national level; and
- a requirement for free-to-air television broadcasters to broadcast the Auslan interpreter when broadcasting emergency warnings and information.[70]

3.57 The ABC explained that it had been considering the use of Auslan interpreters during emergency warning broadcasts. Mr Michael Ward, Head, Operations Planning, ABC informed the committee:

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68 The Hon Robert McClelland MP, Attorney-General, *Communiqué—Standing Council on Police and Emergency Management*, 11 November 2011, p. 3 and
The Hon Robert McClelland MP, Attorney-General, 'Strengthening triple zero services during a disaster', media release, 11 November 2011.

69 Ms Danielle Fried, Disability Policy Advisor, ACCAN, *Proof Committee Hansard*, 8 August 2011, p. 15.

70 Ms Danielle Fried, Disability Policy Advisor, ACCAN, *Proof Committee Hansard*, 8 August 2011, p. 17.

> **Mr Ward:** Yes, we have thought about it. In fact, we have had some approaches since the Queensland floods. There are a number of issues, though, that need to be taken into account. You may recall that, during the floods, someone was providing Auslan signing at some of the broadcasts during the Queensland floods.
>
> **Senator BOYCE:** That was at the Premier's and the police commissioner's press conferences?
>
> **Mr Ward:** That is right. But there was also some criticism that, at times, the framing of the coverage did not include the person doing the signing. Just to go back to your question about cooperation, one point of cooperation is shared footage, pooled footage, so not every broadcaster is at every point and will share the footage from a news conference, for example. If another broadcaster has framed it in such a way that it has left the signing out, then clearly we would not be able to broadcast it. There was also a request to look at picture [in] picture kind of signing. There are two difficulties with that. So, at this stage, all I have is difficulties for you. It is certainly one that we are talking through. The difficulties concern spectrum. You require more spectrum and, currently, spectrum is at a premium. Secondly, you would have—
>
> **Senator BOYCE:** That is something for the picture [in] picture?
>
> **Mr Ward:** That is right, but not if it is live. One of the things here is guaranteeing that service. If we say we are going to do it, then we will do it. So we could not say we are going to do it, then take someone else's pool of footage live from an event, for example, and not have it. That would be a real problem for us. So the kind of technology solution starts to present itself. Spectrum issues arise and so, too, would the availability of someone who is able to do the signing at another point. Then there is the cost of providing that. At this stage it is in, if not the too-hard basket, certainly the very difficult basket and I do not quite know how to solve it. Plus, of course, all of that coverage is captured and live captioned.[71]

3.58 Ms Julie Flynn, Chief Executive Officer, FreeTV Australia responded on behalf of commercial free-to-air television broadcasters to ACCAN's concern:

> On Auslan, we are very strongly of the view that if the emergency service provider or the police or the Queensland Premier or the New South Wales Premier or the Victorian Premier wish to provide Auslan coverage we will make sure that it is within frame. That did not happen at the beginning of the Queensland floods.
>
> As I have said, we have a very close working relationship with the hearing and deaf community and they got in touch with me—I was on holidays—and I got in touch with the broadcasters and within the hour the matter was repaired. So we are more than happy to ensure that processes are in place for Auslan to be captured. We think it is totally impractical to expect

71 Mr Michael Ward, Head, Operations Planning, ABC, *Proof Committee Hansard*, 8 August 2011, pp 46–47.

> broadcasters to provide such and we certainly would not support the need for the provision of such in the news bulletins when we are already legislated to provide closed captioning.[72]

3.59 A related concern, regarding the ability of people with an intellectual disability to understand and respond to an evacuation order, was raised by NCID. NCID explained that not only do people with an intellectual disability need to understand an emergency alert but they also need to be able to respond:

> People have to be able to undertake the action; for example, if the text message, radio message, etc is to evacuate and the person does not have a car or public transport has stopped the person may become anxious and disorientated.[73]

3.60 And:

> Most people with an intellectual disability rely on public transport or the assistance of others. Suggestions that people leave their neighbourhood including evacuation orders will cause difficulty for people who have no transport and may cause distress and panic as they are unable to do as they have been asked.[74]

Committee view

3.61 The dissemination of emergency warnings in Australia via radio, television and telephone / SMS (Emergency Alert and StateAlert) is and will continue to be an important and effective tool to alert communities to emergencies and impending natural disasters.

3.62 Effective and co-operative working relationships between ESOs and radio and television broadcasters improve the timely and accurate dissemination of emergency warnings and information. The committee believes that agreements, such as MOUs, that establish the way in which ESOs and broadcasters share information during an emergency are a welcome development. However, the committee agrees with CRA and FreeTV Australia that up-to-date contact details for key personnel would assist both ESOs and broadcasters to establish contact with one another during an emergency.

Recommendation 3

3.63 The committee recommends that the Commonwealth Government together with national, state and territory emergency service organisations and radio and television broadcasters, develop a secure database of up-to-date contact details for key personnel to be used during an emergency.

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72 Ms Julie Flynn, Chief Executive Officer, FreeTV Australia, *Proof Committee Hansard*, 8 August 2011, pp 54–55.

73 NCID, *Submission 43*, p. 7.

74 NCID, *Submission 43*, p. 8.

3.64 The committee welcomes continued improvements to the Emergency Alert system, specifically the development of a location-based mobile telephone emergency warning capability. The committee urges Australian governments to implement a location-based mobile telephone emergency capability as soon as practicable so that telephone emergency alerts can be better targeted to those people located in the geographic area of an emergency.

3.65 The committee recognises the community's increasing desire to access information through the use of new and "informal" platforms, for example the internet and social media, and was pleased to hear that several state and territory governments are already taking steps to provide emergency information in these ways. The committee encourages federal, state and territory governments and ESOs to use these platforms to further engage with the community during each phase of an emergency (preparation, response and recovery).

3.66 However, the committee agrees with those submitters that indicated the use of new platforms should be an adjunct to and not a replacement for existing emergency warning systems. A suite of tools should be used to alert the community to an emergency, in recognition of the different ways in which people are able to or choose to access such information.

3.67 In regard to emergency alert systems used overseas, such as the Japanese example, as well as other technologies like Sentinel and YellowBird ALERT, the committee is of the view that genuine and careful consideration of their applicability in the Australian context is warranted. In this regard, the committee notes that SCPEM agreed on 11 November 2011 'to continue to harness the latest scientific and technical expertise by conducting another' technology forum in 2012 and that the theme for the 2012 forum will 'be public warning and communication systems and situational awareness'.[75]

3.68 Emergency telecommunication services and the effective dissemination of emergency alerts to people with a disability are vital. The committee was surprised to learn that the guarantees around service delivery for emergency Triple Zero phone calls are not also required for emergency call services available to people with a disability using TTY, Speak and Listen, internet relay, video relay and captioning telephony. The committee believes that emergency call services for people with a disability must be available at all times, as is the emergency Triple Zero service. This is particularly important during times of emergency when people with a disability may be more vulnerable and isolated than the wider community.

75 The Hon Robert McClelland MP, Attorney-General, *Communiqué—Standing Council on Police and Emergency Management*, 11 November 2011, p. 3.

Recommendation 4

3.69 The committee recommends the Commonwealth Government require guaranteed access to emergency call services for people with a disability at all times.

3.70 The committee understands the provision of Auslan interpreters for emergency warnings and information broadcast on free-to-air television is a recent innovation. The committee praises the Queensland state government for taking this step during the 2010-11 floods in that state. The committee was also encouraged to hear that the ABC is considering the provision of Auslan services during emergency information broadcasts despite technical difficulties to do so.

3.71 The committee urges federal, state and territory governments and ESOs to consider the routine use of Auslan interpreters during emergency information bulletins and warnings broadcast on television. Equally, the committee hopes that public and commercial free-to-air television broadcasters undertake to show Auslan interpreters as part of their emergency information and warning broadcasts.

Community preparedness and responsibility

3.72 Community preparedness and responsibility were identified by some submitters as important factors in the ability of communities to prepare for, respond to and recover from an emergency effectively.

3.73 The South Australian government felt community expectations about where responsibility for emergency preparedness lay had shifted so that a greater emphasis was placed on the provision of information and support by government, at the expense of resilience in the community:

> There seems to be an increasing expectation upon governments to provide the perfect information at the perfect time and in a manner that is perfectly tailored for each individual recipient. This is clearly not achievable and certainly not sustainable. If we are not careful, we will create an expectation that all responsibility rests with government, which is not in the best interests of community resilience. Resilience is achieved through a partnership between all levels of government, the community and business.[76]

3.74 This was also noted in the Torrens Resilience Institute's evaluation of Emergency Alert:

> Perhaps the greatest challenge facing governments, organisations and communities today is satisfying society's needs and expectations in the event of a disaster...Over the past few decades we have benefitted greatly from improvements to our safety and occupational health, and we look to

76 Mr David Place, Chief Executive, SAFECOM, *Proof Committee Hansard*, 8 August 2011, p. 23.

> our governments and others in authority to mitigate threats and reduce risks. We demand information to assist us in reducing the likelihood and consequences of a disruptive event, and we expect support to help us recover as quickly and completely as possible.[77]

3.75 Professor Kevin Ronan, Chair, Disaster Reference Group, Australian Psychological Society discussed the importance of community preparedness and emergency warnings in combination:

> A warning message on its own, from our view and from the research that has accumulated over the years, no matter how well crafted, is insufficient. A community has to be...prepared to take up the message in such a way that they are going to be able to use it to protect themselves and their families. One of the things we know about warning messages, for example, is that a finely crafted warning message can be sent to the public and members of the public who are not in risk areas, who are in fact in safe zones, and their high state of emotional arousal starts to compromise their decision-making capacity and they in fact move themselves from a safe zone into a higher hazard zone, or a high risk zone. In order to buttress against that kind of eventuality, it is really important that the human factor is taken into account prior to the need for an early warning and helping prepare communities themselves and also, really importantly, preparing across the various agencies that are somehow linked in with a warning message so that they are collectively all on the same page and are going to be providing the same kind of information that is consistent, accurate, clear, specific and provides specific guidance that is being put out by multiple sources that are trusted by the public.[78]

3.76 Both the ABC and SBS saw it as their role to help prepare Australian communities for emergencies and natural disasters. Mr Anthony Rasmussen, Manager, Regional Local Radio described the activities of ABC Local Radio to assist in the preparation phase:

> Our approach is that we are with our communities before, during and after emergencies. In the 'before' part in particular, we make a point of seasonally running education campaigns through various short promotions on the radio at a regular frequency so that we are educating people to what that alert sounds like on the radio, what they should do when they hear it, how they can prepare their homes, how they can prepare an escape plan and things like that. We run those in the lead-up to seasonal events like cyclones and the bushfire seasons, and all our stations run those on a regular basis in the lead-up to what might be a time when people will need to know that

77 Torrens Resilience Institute, *Assessment of the Effectiveness of Emergency Alert: Final Report*, 30 July 2011, p. 6.

78 Professor Kevin Ronan, Chair, Disaster Reference Group, Australian Psychological Society, *Proof Committee Hansard,* 8 August 2011, pp 34–35.

> information. Hopefully they will not need to put it into practice, but we certainly run promotional campaigns in that 'before' period.[79]

3.77 Mr Hugh James, Manager, Transmission Services, SBS noted that emergency alerts issued on ABC radio are all in English and went on to discuss the SBS's role in educating non-English speakers about emergency warnings and how to appropriately respond to those warnings.[80]

3.78 The NSW and South Australian state governments also highlighted the importance of community preparedness and responsibility, in particular the need for communities to partner with ESOs to enable effective preparation for, response to and recovery from emergencies:

> **Mr Place:** ...there needs to be more emphasis on community self-reliance. It seems as though, when we take a step forward with each new product, the community takes a step back and just expects it to happen. I think there is a very concerted behavioural change issue. This is a partnership. We can supply some of the infrastructure in government. We can supply some of the education and the knowledge and the tools to do it but, without a partner from the community, we cannot respond to everywhere. We cannot have a fire truck or a message out on every corner on every day when there is a major incident.
>
> ...
>
> **Mr Gates:** I think there is an important point that South Australia make, and [Mr Andrew Edwards, NSW State Emergency Service] and [Mr Bruce McDonald, NSW Rural Fire Service] referred to it as well, about the mix of technologies. Looking at the emergency alerting system at night, if you can target a landline, you have a good chance of waking people up. That message, to pick up what Northern Territory said, might simply be, 'Hey, wake up and listen to your radio.' What the Northern Territory said about the timing of that message is important, but then South Australia also said part of the message might be, 'Check your neighbours.' Andrew made a comment to me while you were asking that question about the overreliance on technology. Technology is really important and we have to use it, but, to be effective, we have to rely on some good old community values. People need to be able to talk to one another. As much as I hate to say it, if this increasing trend in the number of emergencies continues, there is a limit to how government can respond. We have to respond as best we can, but the community has to respond as best they can too. Maybe we need to get back to basics and do some basic emergency training exercises and emergency education so that people know what to do in an emergency—who to ring, what to listen to and how to react.

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79 Mr Anthony Rasmussen, Manager, Regional Local Radio, ABC, *Proof Committee Hansard*, 8 August 2011, p. 45.

80 Mr Hugh James, Manager, Transmission Services, SBS, *Proof Committee Hansard*, 8 August 2011, p. 43.

> **Mr McDonald:** That takes us down the path of community engagement. We believe that, beyond community education, there is community engagement, which will build the resilience of communities. As I said before, different communities react differently to different triggers. It is about working with those communities and understanding what their triggers are, what systems they are going to use and making that appropriate.[81]

Committee view

3.79 Community preparedness and responsibility are key factors in determining the resilience of a community to emergencies and natural disasters, and their subsequent ability to recover from such an event.

3.80 The committee acknowledges the challenges faced by ESOs as communities place increasing responsibility and expectations on governments to provide information and support during times of emergency: ESOs cannot be everywhere, all the time. The committee agrees that the public must be an active partner and actively participate in each phase of an emergency if communities are to effectively prepare, respond and recover. Regular, ongoing public education well in advance of an emergency (for example, at the start of each bushfire or flood season) should be used as an opportunity to teach the public about their responsibilities during an emergency and how they can appropriately prepare themselves for such an event.

Recommendation 5

3.81 The committee recommends emergency service organisations in collaboration with television and radio broadcasters, the print media and other relevant organisations, use regular and ongoing public education well in advance of an emergency situation as an opportunity to teach the public about their responsibilities during an emergency and how they can appropriately prepare themselves for such an event.

3.82 Further, the committee welcomes the suggestion by state ESOs that a sense of community and "good old community values" help build community resilience and foster a sense of responsibility amongst communities. Unfortunately, however, it is difficult for governments to "manufacture" a sense of community and community values. Despite the devastation and tragedy experienced by so many Australians, perhaps the silver lining from recent natural disasters has been an increased awareness in affected communities about the importance of good relationships between members of that community and the community's ability to effectively support one another and work together during the preparation, response and recovery phases of an emergency.

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81 Mr David Place, Chief Executive, SAFECOM, Mr Tony Gates, Director, Operations, NSW Telco Authority and Mr Bruce McDonald, Chief Superintendent, NSW Rural Fire Service, *Proof Committee Hansard,* 8 August 2011, p. 27.

Chapter 4

Communications infrastructure

4.1 During the course of the inquiry, public broadcasters and Telstra discussed their ability to broadcast and maintain telecommunication networks, respectively, during an emergency.

4.2 The Australian Broadcasting Corporation (ABC) and Special Broadcasting Service (SBS) raised difficulties associated with damage to infrastructure caused by natural disasters which have the potential to disrupt broadcasting. Telstra also described damage to infrastructure as a result of natural disasters and the steps the company takes to maintain communication across networks during these times. Both the public broadcasters and Telstra identified power outages as a specific challenge.

4.3 The concerns raised in relation to maintaining telecommunications during emergencies can be divided into four key areas related to infrastructure:

- maintaining radio broadcasting and phone coverage when power is unavailable and / or there has been damage to fixed infrastructure;
- the importance of built-in redundancies in infrastructure systems to help networks cope during and after an emergency;
- transportable technology used to maintain telecommunications when fixed infrastructure has been damaged; and
- the advantages and disadvantages associated with overhead versus subterranean telecommunication cabling.

4.4 These matters are discussed below.

Resilience of broadcasting systems

4.5 The ABC identified the resilience of transmission and distribution infrastructure as essential to its ability to provide emergency communications.[1]

4.6 The ABC focused on the role of local radio in providing information to regional Australian communities during times of emergency given the wide geographic area over which ABC local radio services are broadcast.[2] The ABC voiced particular concern about the vulnerability of radio transmission infrastructure during natural disasters:

> Local Radio is broadcast on some 240 transmitters around the country, as well as some 130 self-help installations. While all of the metropolitan

1 Australian Broadcasting Corporation (ABC), *Submission 35*, p. 5.

2 ABC, *Submission 35*, p. 1.

> services and most major regional services have a stand-by program source (such as a satellite feed) and standby power (emergency generators) available, this is not the case with many of the transmitters covering smaller communities in regional Australia. Indeed, some Local Radio transmitters covering major regional populations centres—including the Gold Coast, Toowoomba, Emerald, Albury/Wodonga, Bega, Orange, Grafton, Tamworth, Glen Innes, Kempsey, Broken Hill, Horsham and Karratha—have no stand-by program source available. Similarly, many transmitters covering populations of around 10,000 or fewer people do not have standby power available. A major capital injection would be required to address these shortcomings in the network and secure the services in times of emergencies.[3]

4.7 Mr Hugh James, Manager, Transmission Services, SBS stated that maintaining continuous service at major transmission sites supported the SBS's ability to provide timely information to communities. In particular, Mr James highlighted that continuous service required access to fuel, specifically diesel fuel, when generators were being used:

> **Mr James**: ...Both the ABC and ourselves run gensets [electrical generators] at our major transmission sites so that when the power fails we can stay on air. The limitation is how much fuel we can store on site and how long they can run.
>
> **Senator BACK**: Are these gensets, particularly in the fly-away transmitters [portable transmitters], which I imagine are the ones you are talking about, run on diesel or petrol?
>
> **Mr James**: Diesel generally, and most of them are on the existing transmitter sites, not just on the fly-aways.
>
> **Senator BACK**: What is the problem with underground fuel storage?
>
> **Mr James:** The problem we have is limited capacity—24 hours typically, some of them up to a week—and the need to replenish that and refresh that diesel. The more critical question is a short supply in the event of a long power failure. Once we get past the point of capacity, we need supply. In any emergency where there is a widespread power failure there is high demand for diesel fuel. At the moment, broadcasters have no higher call on that than the local trucking operator or the local hospital, although I have no objection to the hospital getting their fair share.
>
> **Senator BACK**: So you would not object to this committee making a recommendation that, in circumstances like that, you would join the highest priority for supply of diesel fuel.
>
> **Mr James**: I would like to see that as a requirement, yes.
>
> **Senator BACK**: It would specify diesel fuel, because I would not want petrol tankers going into areas.

3 ABC, *Submission 35*, p. 5.

Mr James: No, it is diesel fuel that is the critical one.[4]

4.8 The ABC agreed, while highlighting the extent to which AM radio broadcasting is a key component of its own emergency communications strategy:

> I would endorse Mr James's statements and also say that that would be an important issue from our perspective as well. We have found the resilience of AM radio broadcasting during an emergency to be one of the key aspects of our role. The two greatest problems that can occur are that, first, the site is hit by the disaster itself, such as a fire or flood, and therefore you lose the transmitter; but the far more likely one, the longer an emergency goes on, is that a power supply problem will occur and once you lose electricity you go to the generator backup and you have a fuel problem. I know during the Brisbane floods one of our real issues for a few days was just this point, of wrangling to make sure that we had a fuel supply in the situation that power is turned off in central Brisbane and we were not able to transmit. So the issue of having access like that is of critical importance, I agree.[5]

4.9 The resilience of the broadcasting system was also raised in terms of limited bandwith and mobile phone coverage. The ABC noted that limited bandwith in regional areas had impacted on access to information:

> Limited network bandwidth can and has delayed content delivery during emergencies. Most ABC regional stations are currently limited to 1Mb/second network links, which are too narrow to handle high volumes of network traffic. Reporters using domestic internet connections in the field have also encountered local congestion during emergencies, making it more difficult to access the internet and in turn affecting information gathering and dissemination.[6]

Resilience and redundancy of telecommunications infrastructure

4.10 The design of telecommunications infrastructure, and the extent to which it can withstand damage during natural disasters, was explained by Telstra:

> Telecommunications network architecture is normally designed to deliver traffic from individual premises to be collected and transported back up into higher levels of the network. The design rules used in developing such network architecture will determine the degree of resilience and survivability against fibre cuts, damaging weather events, and optical equipment failures. In all network implementations, final design decisions

4 Mr Hugh James, Manager, Transmission Services, SBS, *Proof Committee Hansard*, 8 August 2011, pp 43–44.

5 Mr Michael Ward, Head, Operations Planning, ABC, *Proof Committee Hansard*, 8 August 2011, pp. 44.

6 ABC, *Submission 35*, p. 5.

> that determine the level of resilience need to be balanced against how the application of these rules will affect network performance and costs.[7]

4.11 Telstra noted the inevitability of natural disasters and the subsequent 'unavoidable' impact on communications infrastructure.[8] Telstra stated that '...such impacts can be reduced if networks are planned and operated with this inevitability in mind'[9] and described the company's experience during the summer of 2010–11 by way of example:

> While Telstra's networks and communications operations did suffer damage as a result of the various disasters during the summer of 2010/11, its fixed, mobile and managed radio service networks and associated disaster recovery operations and processes operated very effectively. Telstra staff worked quickly and effectively and in many cases around the clock to restore services efficiently, once it was safe for our people to access impacted areas. In many cases the existence of multiple networks in affected areas meant that alternative forms of communication were still able to be maintained.[10]

4.12 In addition to the power supply issues raised by the ABC and SBS, the importance of maintaining power supply for telecommunications networks was flagged by Telstra. Telstra stated:

> Power loss is a very significant issue confronted by Telstra in maintaining the operation of its networks during extreme weather events, including fires, flooding and cyclones.
>
> Key elements of Telstra's networks rely on a continuous supply of power. These include exchanges and mobile base stations. If the power supply is disrupted, functionality may be lost to that equipment, and to the services supported by that equipment.[11]

4.13 In response to power supply difficulties, Telstra recommended that '[s]ome consideration may need to be given to additional strategies to better preserve the supply of electricity in the event of disasters'.[12]

4.14 The effect National Broadband Network (NBN) technology may have on network resilience was also raised during the course of the inquiry:

> Future communication technologies, such as the National Broadband Network (NBN), have the potential to influence how emergencies and natural disasters are managed. Much will depend on the network design

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7 Telstra, *Submission 31*, p. 17.

8 Telstra, *Submission 31*, p. 4.

9 Telstra, *Submission 31*, p. 4.

10 Telstra, *Submission 31*, p. 4.

11 Telstra, *Submission 31*, pp 15–16.

12 Telstra, *Submission 31*, p. 5.

> which impacts the resilience of the network in the face of natural disasters.[13]

4.15 Specifically, the effect of NBN technology on resilience was associated with the fibre-optic cable network which the NBN will roll out and which requires power supplies to be maintained at both ends of the network.[14] Telstra explained that in this regard the NBN differed from Telstra's existing copper network 'where a standard landline phone draws the power it needs from the wires that connect the phone to the network':[15]

> As telecommunications fixed access networks evolve from copper to fibre optics it is important to understand the impact on service availability during power outages. As stated above, all telecommunications networks need power to operate. Fibre optic networks are no exception and require power to be available at both the switch and the customer ends of the network to remain operative. This is different to the existing Telstra copper network design.[16]

4.16 The Fire and Emergency Services Authority of WA (FESA) agreed that 'power supply issues' associated with the NBN need to be considered.[17]

4.17 Information provided to the committee during the inquiry about the resilience and redundancy of telecommunications infrastructure also included discussion of overhead and subterranean cabling, as well as the use of transportable infrastructure to maintain communication networks following a natural disaster.

Overhead versus subterranean cabling

4.18 There was some discussion during the inquiry about the placement of telecommunications cabling either overhead or below ground and the differing ways in which these are able to withstand natural disasters.

4.19 In support of subterranean cabling, Telstra made the following comments:

> While no network will be able to withstand the full force of intense and prolonged natural disasters, a critical consideration in network design is the location of cables. In Telstra's experience, underground cables are generally more resilient in the face of natural disasters. By way of example the severity of heat levels experienced in the Victorian Black Saturday bushfires was such that there was some (albeit limited) direct fire damage to optical fibre located within pits. While the vast majority of the network withstood the intensity of those fires, some 18 pits were impacted. Aerial

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13 Telstra, *Submission 31*, p. 17. See also Mr David Lemcke, *Submission 2*, [p. 1].

14 Telstra, *Submission 31*, p. 17 and DBCDE, *Submission 34*, pp 16–17.

15 Telstra, *Submission 31*, p. 17.

16 Telstra, *Submission 31*, p. 17.

17 Fire and Emergency Services Authority of WA, *Submission 18*, p. 3.

> cabling is also particularly vulnerable in cyclones and high winds. In flood situations, poles may be washed away, leading to aerial cabling across creeks and rivers being severed.[18]

4.20 Telstra subsequently noted that in determining which cabling options were most appropriate it was necessary to consider both practical matters, such as the ability to lay cables in certain terrain, and the benefits of using underground cabling in flood and cyclone prone areas:

> The vast majority of Telstra's cabling is laid underground, whether copper cables or fibre (typically laid inside conduits and pits). Generally, aerial cables are used when the terrain is not suitable for underground cabling. As an example, where the terrain is solid rock it is not practical to lay underground cabling. In some areas it is not possible to lay an underground cable without an unacceptable environmental impact and so aerial cables are used. Installation of underground or aerial cables will be subject to all necessary approvals being obtained for the deployment. Telstra's experience is that underground cabling is more robust than aerial cabling even in areas prone to flooding from cyclones as the combination of excessive rain and wind, especially in the cyclone season, can cause considerable damage to aerial cabling.[19]

4.21 In relation to the NBN, the placement of cables was raised by FESA. FESA emphasised the importance of considering the types of natural disasters experienced in a particular location when deciding whether cables should be laid overhead or underground:

> It is understood that in Tasmania the Broadband Network cables are above ground which creates problems in a bushfire, storms etc, highlighting the need for a reliable power source. As has been demonstrated in WA, above ground communications infrastructure is vulnerable in the event of a significant natural event. Whilst not immune from impact or failure, those assets that are purpose built for their operating environment, and having regard to the likely events that may impact upon that environment, will stand a greater chance of survivability.[20]

The role of transportable infrastructure

4.22 Transportable infrastructure can be deployed following a natural disaster to maintain communication networks even where fixed infrastructure has sustained damage. In this way, transportable infrastructure has the potential to bolster the resilience of telecommunications systems in times of emergency.

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18 Telstra, *Submission 31*, p. 17.

19 Telstra, *Answers to questions taken on notice*, 8 August 2011 (received 30 August 2011).

20 Fire and Emergency Services Authority of WA (FESA), *Submission 18*, p. 3; see also Tasmania Fire Service, *Submission 23*, [p. 3].

4.23 The committee heard about different types of transportable infrastructure and the ways in which these can increase the speed at which services are restored to areas affected by natural disasters:

> Telstra's experience with disasters has led to the development of innovative technology solutions, such as Cells on Wheels (COWs), Satellite Cells on Wheels (SatCOWs) and Mobile Exchanges on Wheels (MEOW). These solutions help restore services quickly to disaster impacted communities, and assist in the overall recovery effort.
>
> A COW is a temporary mobile base station that provides temporary coverage if a mobile site is lost; alternatively it can provide a temporary expansion of mobile coverage.
>
> A SatCOW is ideal for locations where there is no terrestrial backhaul network or power is available – it provides Telstra Next GM network coverage. It is highly portable, being able to be transported in a standard 4WD or light aircraft or helicopter, and can be set up within 1.5 hours. In the aftermath of Cyclone Yasi a SatCOW was deployed to Palm Island, restoring communications in 24 hours.
>
> A COW and a MEOW can operate using generators, batteries or mains power to enable the quick installation of temporary communication solutions, especially for those communities hardest hit by the disaster. A SatCOW has the benefit of being able to operate even if there is no transmission or power.[21]

4.24 Telstra informed the committee that it had deployed transportable infrastructure during the summer of 2010-11:

> It is certainly the case that our networks and operations suffered damage as a result of the various disasters during the summer, but our fixed, mobile and managed radio service networks and associated disaster recovery operations and processes operated very effectively...Our standard disaster response processes included a range of measures to help customers stay in touch with family and friends when normal services had been affected...We used our COWs, SatCOWs and the other technology—mobile exchange on wheels, to give its full title.[22]

4.25 The deployment of this technology, together with other elements of Telstra's emergency procedures meant that, in Telstra's view, 'its fixed, mobile and managed radio service networks and associated disaster recovery operations and processes operated very effectively'.[23]

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21 Telstra, *Submission 31*, pp 12–13.

22 Mr Jamie Snashall, Senior Adviser, Telstra, *Proof Committee Hansard*, 8 August 2011, p. 67.

23 Telstra, *Submission 31*, p. 4.

4.26 The fallibility of infrastructure, including the NBN, was acknowledged by the Department of Broadband, Communications and the Digital Economy (DBCDE).[24] With respect to the resilience and protection of critical communications infrastructure, DBCDE stated:

> Infrastructure providers have primary responsibility for managing, and responding to, emergencies and disasters which impact on their services. The department supports the work of critical infrastructure providers through its secretariat services for the Communications Sector Group, as well as through monitoring the work of the communications industry.[25]

4.27 The Communications Sector Group (CSG) comprises representatives from relevant Commonwealth, state and territory government agencies as well as the owners and operators of critical infrastructure in the telecommunications, broadcasting, international submarine communications cables and postal sectors'.[26] The committee was informed that:

> The CSG has conducted numerous discussion exercises since 2006 which were developed to raise awareness of the impact of communications during emergencies and build resilience for future prevention, preparedness, response and recovery activities. A key outcome has been the increased awareness of the interdependencies within the communications sector (for instance, broadcasting reliance on telecommunications) and across the broader critical infrastructure sectors (for instance, the communications sector‘s reliance on the supply of mains electrical power).
>
> Members of the CSG have individual business continuity and disaster recovery plans to respond to, and mitigate, the impacts of an emergency or disaster.[27]

4.28 In addition to the work of the CSG, the Commonwealth Government's Critical Infrastructure Resilience Strategy (CIRS) recognises that much 'of Australia’s critical infrastructure is privately owned or operated on a commercial basis'.[28] For this reason, the federal government has sought to partner with infrastructure owners and operators 'to enhance the resilience of critical infrastructure' by:

- sharing information;
- raising awareness of dependencies and vulnerabilities; and

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24 Department of Broadband, Communications and the Digital Economy (DBCDE), *Submission 34*, p. 4.

25 DBCDE, *Submission 34*, p. 2.

26 DBCDE, *Submission 34*, p. 2.

27 DBCDE, *Submission 34*, p. 2.

28 Attorney-General's Department, *Critical Infrastructure Resilience Strategy*, 2010, available: www.ag.gov.au/www/agd/rwpattach.nsf/VAP/(9A5D88DBA63D32A661E6369859739356)~Australian+Government+s+Critical+Infrastructure+Resilience+Strategy.PDF/$file/Australian+Government+s+Critical+Infrastructure+Resilience+Strategy.PDF (accessed 28 October 2011), p. 4.

- facilitating collaboration to address impediments.[29]

4.29 The CIRS continues:

> The Australian Government has established the Trusted Information Sharing Network (TISN) for Critical Infrastructure Resilience (CIR) as its primary mechanism to build a partnership approach between business and government for CIR. The Australian Government has the unique ability to bring critical infrastructure sectors together in a non-competitive environment to discuss and address vulnerabilities within sectors on a national or cross-jurisdictional basis as well as enabling the identification of cross-sector dependencies. While the business-government partnership is the cornerstone of the CIR approach, there are a number of other important imperatives that contribute to the collective effort.
>
> This Strategy has six complementary strategic imperatives to build CIR and achieve the Australian Government's aim and objectives:
>
> - operate an effective business-government partnership with critical infrastructure owners and operators
> - develop and promote an organisational resilience body of knowledge and a common understanding of organisational resilience
> - assist owners and operators of critical infrastructure to identify, analyse and manage cross-sectoral dependencies
> - provide timely and high quality policy advice on issues relating to critical infrastructure resilience
> - implement the Australian Government's Cyber Security Strategy to maintain a secure, resilient and trusted
> - electronic operating environment, including for critical infrastructure owners and operators, and
> - support the critical infrastructure resilience programs delivered by Australian States and Territories, as agreed and as appropriate.[30]

4.30 Regarding the NBN and its power supply needs, DBCDE explained that the federal government had instructed NBN Co 'to deploy battery backup capabilities within all network termination devices (NTDs) connected within the fibre footprint'.[31] The department continued:

> During a mains power failure, the battery backup is expected to allow the end-user to receive telephony services for up to five hours. As an additional safeguard, when battery runs down to approximately half its capacity,

29 Attorney-General's Department, *Critical Infrastructure Resilience Strategy*, 2010, p. 4.

30 Attorney-General's Department, *Critical Infrastructure Resilience Strategy*, 2010, p. 4.

31 DBCDE, *Submission 34*, p. 4.

power is automatically cut-off. This reserve would then be manually activated by the end-user to enable an emergency call to be made.[32]

Committee comment

4.31 The committee recognises the importance of maintaining telecommunications systems during and after emergencies, and the challenges that both broadcasters and telecommunications organisations face in doing so.

4.32 Access to power is essential. Given the important role of ABC local radio (in particular) in broadcasting emergency warnings and information, and the difficulties the public broadcaster can face when sourcing diesel fuel to power radio transmission sites, the committee is sympathetic to the ABC's request that consideration be given to granting priority access to fuel by public broadcasters. The committee therefore recommends that the government consider—without causing detriment to ESOs—granting priority fuel access to public broadcasters during emergencies for the purpose of broadcasting emergency warning and information.

Recommendation 6

4.33 The committee recommends the government consider granting public broadcasters priority access to fuel during times of emergency for the purpose of broadcasting emergency warnings and information, and in a way that does not impede the ability of emergency service organisations to access fuel.

4.34 The resilience of telecommunications infrastructure to withstand natural disasters and the availability of back-up systems, such as COWs, SatCOWs and MEOWs, when fixed infrastructure fails determine how well communications networks can be maintained at these times. The frequency with which natural disasters occur in Australia means that resilience and redundancy will continue to be key features of Australia's telecommunications infrastructure systems.

4.35 The committee notes the work being conducted by the federal government and the telecommunications industry through the Communications Sector Group and the Critical Infrastructure Resilience Strategy. The committee encourages the government to work with industry to examine the impact of recent natural disasters on telecommunications infrastructure to identify weaknesses and areas for improvement so that disruptions to telecommunications networks during and after future emergencies can be kept to a minimum.

4.36 The committee commends Telstra's use of transportable infrastructure during recent natural disasters to maintain telephone networks. The committee encourages telecommunications companies to continue to develop technology such as this for use into the future.

32 DBCDE, *Submission 34*, p. 5.

4.37 With respect to the NBN, the committee notes that NBN infrastructure will face similar challenges to existing networks when it comes to withstanding natural disasters. The NBN will, therefore, be susceptible to damage and failure during an emergency in much the same way as existing telecommunications infrastructure.

Senator Mary Jo Fisher
Chair

Appendix 1

Submissions, tabled documents, additional information and answers to questions taken on notice

Submissions

1	Prof. Stephen Robson and Mr David Templeman
2	Mr David Lemcke
3	Geoscience Australia
4	Australian Communications Consumer Action Network
5	Northern Territory Police, Fire and Emergency Services
6	Broadcast Australia and Airwaves Solutions Australia
7	Mr Brett Hannaford
8	Sentinel Alert Pty Ltd
9	Government of South Australia
10	Motorola Solutions
11	Police Federation of Australia
12	Special Broadcasting Service Corporation
13	Australian Risk Policy Institute
14	Commercial Radio Australia
15	Floodplain Management Association
16	Free TV Australia
17	NSW State Emergency Service
18	Fire and Emergency Services Authority of WA
19	Internode
20	The International Emergency Management Society
21	Mr James Davison
22	Local Government Association of Queensland
23	Tasmania Fire Service
24	Commonwealth Attorney-General's Department
25	Confidential
26	Lake Macquarie City Council
27	Mr David Tones

28 Government of Victoria

29 The Early Warning Network

30 Mr Jason Bordujenko

31 Telstra

32 Australian Psychological Society

33 Australian Mobile Telecommunications Association and Communications Alliance

34 Department of Broadband, Communications and the Digital Economy

35 Australian Broadcasting Corporation

36 Burdekin Shire Council

37 Mr Kim Allen

38 Australian Federal Police

39 Tasmanian Government

40 Confidential

41 New South Wales Government

42 Bureau of Meteorology

43 National Council on Intellectual Disability

44 Bushfire CRC

45 Mr Mark Armstrong, Field Secure

46 Emergency Warning Systems Pty Ltd

47 Queensland Government

Additional information

1 Additional information from Commercial Radio Australia – Code of Practice 8, Broadcast of Emergency Information

2 Additional information from Commercial Radio Australia – Memorandum of Understanding: Procedures for broadcasting of emergency information by Commercial Broadcasters in Victoria

Answers to questions taken on notice

1 Australian Mobile Telecommunications Association/Communications Alliance – Answers to questions taken on notice (from public hearing, Canberra, 9 August 2011)

2 Northern Territory Police, Fire and Emergency Services – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

3 Geoscience Australia – Answers to questions taken on notice (from public hearing, Canberra, 9 August 2011)

4 Australasian Fire and Emergency Service Authorities Council – Answers to questions taken on notice (from public hearing, Canberra, 9 August 2011)

5 Police Federation of Australia – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

6 Bureau of Meteorology – Answers to questions taken on notice (from public hearing, Canberra, 9 August 2011)

7 ABC – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

8 Internode – Answers to written questions taken from Senator Fisher

9 Australian Communications Consumer Action Network – Answers to questions on notice (from public hearing, Canberra, 9 August 2011)

10 Commercial Radio Australia – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

11 Free TV Australia – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

12 Australian Federal Police – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

13 Australian Psychological Society – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

14 Telstra – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

15 Internet Society of Australia – Answers to questions taken on notice (from public hearing, Canberra, 9 August 2011)

16 Department of Broadband, Communications and the Digital Economy – Answers to questions taken on notice (from public hearing, Canberra, 9 August 2011)

17 SBS – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

18 South Australia Fire & Emergency Services – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

19 Attorney-General's Department – Answers to questions taken on notice (from public hearing, Canberra, 9 August 2011)

20 NSW Government Telco Authority – Answers to questions taken on notice (from public hearing, Canberra, 8 August 2011)

Appendix 2

Public hearings

Monday, 8 August 2011 – Canberra

Australian Federal Police

Deputy Commissioner Michael Phelan, Close Operations Support

Assistant Commissioner Neil Gaughan, National Manager, High Tech Crime Operations

Commander Robert Gilliland, AFP Operations Coordination Centre

Police Federation of Australia

Mr Mark Burgess, Chief Executive Officer

Ms Dianne Gayler, Senior Policy Officer

Australian Communications Consumer Action Network

Ms Elissa Freeman, Director of Policy and Campaigns

Ms Danielle Fried, Disability Policy Adviser

Northern Territory Fire and Rescue Service

Mr Michael Ayre, Acting Director

Mr Anthony Chivell, Manager, Communications and Electronic Support Section

Mr Grant Hamon, Manager, Community Fire Safety

Northern Territory Emergency Service

Mr Peter Davies, Director

South Australian Police

Superintendent Colin Cornish, Communications Branch

Government of South Australia

Mr Mark Hanson, Director, Public Safety Communications

South Australian Fire and Emergency Services Commission

Mr David Place, Chief Executive

New South Wales State Emergency Service

Mr Andrew Edwards, Director, Information Communication and Technology

New South Wales Government

Mr Tony Gates, Director, Operations, Telco Authority

New South Wales Rural Fire Service

Mr Bruce McDonald, Chief Superintendent

Australian Psychological Society

Dr Susie Burke, Senior Psychologist, Public Interest, Disasters and the Environment

Professor Kevin Ronan, Chair, Disaster Reference Group

Special Broadcasting Service Corporation

Mr Hugh James, Manager, Transmission Services

Australian Broadcasting Corporation

Dr David Sutton, Head of Strategic Policy

Mr Michael Ward, Head, Operations Planning

Mr Anthony Rasmussen, Manager, Regional Local Radio

Free TV Australia

Ms Julie Flynn, Chief Executive Officer

Ms Holly Brimble, Director, Legal and Broadcast Policy

Southern Cross Austereo

Mr Rodney Brice, Programming Operations and Regional Research Manager

ACE Radio Broadcasters

Mr Mark Taylor, Group Program Manager

Commercial Radio Australia

Ms Joan Warner, Chief Executive Officer

Telstra

Mr Anthony Goonan, Director, Network and Commercial Planning

Mr John Parkin, Director, Customer Satisfaction and Experience

Mr Jamie Snashall, Senior Adviser, Government Relations

Tuesday, 9 August 2011 – Canberra

Australia New Zealand Policing Advisory Agency

Mr Andrew Scipione, Board Member

Mr Peter Barrie, Advisor

Dr Palitha Kuruppu, Advisor

Australasian Fire and Emergency Service

Ms Naomi Brown, Chief Executive Officer

Australian Mobile Telecommunications Society

Mr Chris Althaus, Chief Executive Director

Ms Lisa Brown, Manager, Policy

Burdekin Shire Council

Mr Kenneth Holt, Chief Executive Officer

Internet Society of Australia

Mr Tony Hill, President

Internode

Mr John Lindsay, General Manager, Regulatory and Corporate Affairs

Geoscience Australia

Dr Andrew Barnicoat, Acting Chief, Geospatial and Earth Monitoring Division

Mr Gordon Cheyne, Director, Operations, National Earth Observation Group

Bureau of Meteorology

Ms Ann Farrell, Head, Marine and Agricultural Weather Services

Mr Alasdair Hainsworth, Assistant Director, Weather and Ocean Services Branch

Australian Communications and Media Authority

Ms Maureen Cahill, General Manager, Communications Infrastructure Division

Dr Andrew Kerans, Executive Manager, Spectrum Infrastructure Branch

Department of Broadband, Communications and the Digital Economy

Mr Andrew Maurer, Assistant Secretary, Spectrum and Wireless Services

Attorney-General's Department

Mr James Anderson, Director, National Security Coordination and Communications Section

Mr Peter Channells, Assistant Secretary, Emergency Management Capability Development

Mr Kym Duggan, First Assistant Secretary, National Security Capability Development

Mr Michael Pahlow, Assistant Secretary, Counter-Terrorism Capability Development

Ms Diane Podlich, Director, Emergency Management Policy

Mr Michael Rothery, First Assistant Secretary, National Security Resilience Policy

Appendix 3

Inquiries into recent natural disasters in Australia

Inquests and inquiry into the Canberra firestorm

Between 8 and 18 January 2003, Canberra experienced a firestorm that resulted in the loss of four lives, injury to 435 people, the destruction of 487 homes across several suburbs, total property losses valued between $600 million and $1 billion, and almost 70 per cent of the ACT (157 170 hectares) being burnt.[1]

In January 2003, a Coronial inquest into the Canberra bushfires was established.[2]

Recommendations

On 19 December 2006, the ACT Coroner Maria Doogan handed down her report on the Canberra firestorm. With respect to emergency communications and warning systems, Ms Doogan made the following recommendations that:

- the Emergency Services Agency adopt a more rigorous risk management approach to incident management and prediction—with particular emphasis on the development of improved community information strategies and protocols;
- the Emergency Services Agency review the communications systems used by the four services (the ACT Ambulance Service, the ACT Rural Fire Service, the ACT State Emergency Service and the ACT Fire Brigade), by the Australian Federal Police (AFP), by the NSW emergency services and by aircraft and ensure the systems are compatible;
- measures be taken to ensure that ACT and NSW Rural Fire Service radio communications systems are integrated, so that ACT and NSW firefighting units can communicate with each other;
- consultations and negotiations occur between the Emergency Services Agency and the NSW Rural Fire Service to ensure that fire risk and safety messages to the community are co-ordinated. Maximum use should be made of television and radio announcements throughout the ACT and southern NSW, consistent with NSW timetables for targeted programs in conjunction with the United Firefighters Union ACT Branch and volunteer fire brigade representatives. The Energy Services Agency should consider using ACT Fire Brigade staff

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1 Coroner Maria Doogan, Coroner (ACT), *The Canberra Firestorm: inquests and inquiry into four deaths and four fires between 8 and 18 January 2003*, December 2006, p. 3.

2 ACT Magistrates Court, *ACT Coroner's Court 2003 Bushfire Inquiry*, available: www.courts.act.gov.au/magistrates/page/view/596/title/act-coroners-court-2003-bushfire (accessed 30 June 2011).

and ACT Rural Fire Service volunteers to talk to groups in the community on request, thus furthering face-to-face community education in high-risk suburban areas of the ACT;

- the Emergency Services Agency publicise and demonstrate the use of the Standard Emergency Warning Signal and provide to the community adequate explanation of the application of the signal. This should occur at least annually, in conjunction with any pre-summer fire awareness initiatives;
- the Emergency Services Agency develop a clear policy for disseminating information to the public and the media in times of emergency and that, as required, that policy incorporate advance door-knocking of homes in the area affected, as well as regular broadcasts by local radio and television stations and regular updates on the relevant website;
- the Emergency Services Agency conduct investigations—and liaise with emergency services agencies in other jurisdictions—in order to ascertain what technologies exist and are effective for use in disseminating warnings and associated information to the community of the ACT; and
- a system of public warnings that uses grid references shown on the maps in the Canberra telephone directory be adopted.[3]

ACT government response

In February 2007, the ACT Government released its response to the Coroner's report.[4] With respect to the recommendations made about emergency communications and early warning systems (above), the government agreed or agreed in principle with all of these recommendations and advised that many had already been implemented.[5]

2009 Victorian Bushfires Royal Commission

On 7 February 2009, Victoria experienced a devastating bushfire disaster that resulted in the deaths of 173 people.[6] This day has been called "Black Saturday".[7]

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3 Coroner Maria Doogan, Coroner (ACT), *The Canberra Firestorm: inquests and inquiry into four deaths and four fires between 8 and 18 January 2003*, December 2006, pp 217, 222 and 223.

4 ACT Government, *ACT Government response to recommendations of the Coroner's Court in the Canberra Firestorm: inquest and inquiry into four deaths and four fires between 8 and 18 January 2003*, February 2007.

5 ACT Government, *ACT Government response to recommendations of the Coroner's Court in the Canberra Firestorm: inquest and inquiry into four deaths and four fires between 8 and 18 January 2003*, February 2007.

6 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, p. vii.

7 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, p. vii.

On 16 February 2009, the 2009 Victorian Bushfires Royal Commission was established.[8] The Royal Commission examined 15 of the most damaging fires, including the five fires at Kilmore East, Murrindindi, Churchill, Beechworth-Mudgegonga and Bendigo where people lost their lives.[9]

In its final report of July 2010, the Royal Commission found:

> ...that the state-level emergency management arrangements still faltered because of confusion about responsibilities and accountabilities and some important deficiencies of leadership. True integration was not achieved: the [Country Fire Authority] and [Department of Sustainability and Environment] followed operating procedures that were not fully consistent, used separate technology systems, and in many cases performed duplicate functions.[10]

The report also made the following observations:

> Those [Incident Management Teams] that were poorly prepared or did not have access to fully qualified staff also often had the greatest difficulty managing information flows, which are crucial to the issuing of public warnings and informing firefighters of changing conditions and potential danger...skilled officers need to be supported by robust, consistent and coordinated information and systems for tracking fire vehicles and mapping fires. When the State's approach to fighting ferocious fires is so highly dependent on cross-agency coordination it is unacceptable that effective coordination of information systems has not been achieved.[11]

And:

> Communications systems on 7 February were also hindered by poor coverage, lack of interoperability between emergency services agencies, and insufficient investment in new technology. For example, the transmission speed of the paging system had been reduced in order to expand reception coverage, and this caused serious delays in other than the most urgent messaging. There were also communication difficulties between metropolitan and regional police because of incompatible radio systems. Further, radio 'black spots' meant that reception was poor or non-existent in some areas, and there was channel congestion and insufficient channel availability. These problems were exacerbated when fire damaged or destroyed radio and telecommunications infrastructure.[12]

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8 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, p. 1.

9 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, p. 4.

10 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, p. 8.

11 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, p. 9.

12 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, p. 11.

Recommendations

Ultimately, the Royal Commission made several recommendations with respect to emergency communications and early warnings:

- the State revise its bushfire safety policy. While adopting the national Prepare. Act. Survive. framework in Victoria, the policy should include the following (amongst other criteria):
    - enhance the role of warnings – including providing for timely and informative advice about the predicted passage of a fire and the actions to be taken by people in areas potentially in its path;
- the Country Fire Authority (CFA) and the Department of Sustainability and Environment (DSE) standardise their operating systems and information and communications technologies with the aim of achieving greater efficiency and interoperability between agencies; and
- the CFA review and improve its communications strategy as a matter of priority and develop a program for identifying and responding to black spots in radio coverage.[13]

Victorian government response

The Victorian Government has responded to the recommendations made in the Royal Commission's interim report of August 2009.[14] The government has not yet responded to the recommendations in the final report.

In the response to the interim report, the Victorian Government was supportive of recommendations that suggested improvements to bushfire communications and warnings, including the following recommendations that:

- the State ensure that bushfire warnings issued in Victoria are founded on the principle of maximising the potential to save lives; embody the principles encapsulated in the Council of Australian Governments (COAG) report titled *National Inquiry on Bushfire Mitigation and Management* (2004);
- the State ensure the content of bushfire warnings issued in Victoria reflects the principles set out in the Commonwealth policy paper *Emergency Warnings – Choosing Yours Words* (2008);
- the State ensure bushfire warnings in Victoria are confined to two categories or stages: "bushfire information" and "bushfire warning";

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13 2009 Victorian Bushfires Royal Commission, *Final Report: summary*, July 2010, pp 23 and 28.

14 Government of Victoria, *Response to the 2009 Victorian Bushfires Royal Commission Interim Report*, October 2009, available: www.justice.vic.gov.au/wps/wcm/connect/justlib/DOJ+Internet/resources/4/a/4aa53600404a495fbd29fff5f2791d4a/Response_to_2009_Victorian_Bushfires_Royal_Commission_Recommendations.pdf (accessed 28 June 2011).

- the State ensure that the Standard Emergency Warning Signal (SEWS) be used in Victoria to precede each bushfire warning or group of warnings that are dangerous or extremely dangerous;
- the State invite commercial operators to enter into a Memorandum of Understanding (MOU) on the dissemination of bushfire warning messages and the use of the SEWS by those operators;
- the Australian Government, COAG and the State determine whether it is technically possible to implement the second phase of Emergency Alert (that is, the delivery of warning messages to mobile phones based on physical location of a handset at the time of the emergency) with a view to implementation for the 2009–10 bushfire season;
- the State ensure that a single, multi-agency portal for bushfire information be designed to allow incident control centres to directly post information and warnings;
- the State ensure the Victorian Bushfire Information Line is funded to enable it to provide greater surge capacity during extreme events and to improve the efficiency of its internal information function;
- the State and its agencies implement an advertising and awareness campaign on the changes to policy and practices as set out in the Royal Commission's report, such as the SEWS, Emergency Alert, use of sirens by local communities, refuges and relocation;
- the State amend the *State Emergency Response Plan* so the control agency for a fire is responsible for issuing and communicating warnings; and to remove from emergency response coordinators the responsibility of ensuring the control agency gives consideration to alerting the public to dangers and potential dangers arising from an emergency;
- the Office of the Emergency Services Commissioner formally advise the Emergency Services Telecommunications Authority (ESTA) and Telstra Triple Zero of forecast severe fire risk days and particularly days where there is a risk of extremely dangerous bushfires;
- the State ensure ESTA is funded to provide greater surge capacity during extreme events, including establishing additional work stations for fire calls at ESTA centres; and
- the State further promote, through COAG, more effective emergency call service arrangements throughout Australia.[15]

15 Government of Victoria, *Response to the 2009 Victorian Bushfires Royal Commission Interim Report*, October 2009, available: www.justice.vic.gov.au/wps/wcm/connect/justlib/DOJ+Internet/resources/4/a/4aa53600404a495fbd29fff5f2791d4a/Response_to_2009_Victorian_Bushfires_Royal_Commission_Recommendations.pdf (accessed 29 June 2011).

Queensland Floods Commission of Inquiry

During December 2010 and January 2011, Queensland experienced an unprecedented flooding disaster which impacted 70 per cent of the state.[16]

On 17 January 2011, the Premier of Queensland, the Hon Anna Bligh MP established the Queensland Floods Commission of Inquiry.[17] The terms of reference for the inquiry included:

> ...to make full and careful inquiry in an open and independent manner with respect to the following matters:-
>
> (a) the preparation and planning by federal, state and local governments; emergency services and the community for the 2010/2011 floods in Queensland,
>
> ...
>
> (c) all aspects of the response to the 2010/2011 flood events, particularly measures taken to inform the community and measures to protect life and private and public property, including
>
> - immediate management, response and recovery
> - resourcing, overall coordination and deployment of personnel and equipment
> - adequacy of equipment and communications systems; and
> - the adequacy of the community's response.
>
> (d) the measures to manage the supply of essential services such as power, water and communications during the 2010/2011 flood events,
>
> (e) adequacy of forecasts and early warning systems particularly as they related to the flooding events in Toowoomba, and the Lockyer and Brisbane Valleys...[18]

The Floods Commission released an interim report on 1 August 2011 'on matters associated with flood preparedness to enable early recommendations to be implemented before next summer's wet season'.[19]

Recommendations

Recommendations in the interim report relevant to the current inquiry included:

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16 Queensland Floods Commission of Inquiry, *Home*, available: www.floodcommission.qld.gov.au/home (accessed 20 June 2011).

17 Queensland Floods Commission of Inquiry, *Terms of Reference*, available: www.floodcommission.qld.gov.au/terms-of-reference (accessed 20 June 2011).

18 Queensland Floods Commission of Inquiry, *Terms of Reference*, available: www.floodcommission.qld.gov.au/terms-of-reference (accessed 20 June 2011).

19 Queensland Floods Commission of Inquiry, *Terms of Reference*, available: www.floodcommission.qld.gov.au/terms-of-reference (accessed 20 June 2011).

- before the next wet season, local governments susceptible to flooding should conduct community education programs which provide local information about (at least) the following topics:
  - the types of warnings that are used in the area, what they mean and what to do in the event of a warning;
  - where and how to obtain information before, during and after a disaster;
  - what is likely to happen during a disaster (for example, power outages and road closures); and
  - evacuation measures available for groups who require particular assistance (for example, the elderly, ill and people with a disability).
- in issuing warnings for a district or region, local and state authorities should use a range of different warning mechanisms effective for the particular district or region, including methods which do not rely on electricity.
- councils should prepare SMS alert templates covering a range of different flood scenarios before the wet season.
- SMS alerts should direct recipients to websites or contact numbers providing more detailed information about flood locations and predictions, the location of evacuation centres and evacuation routes.
- councils and Emergency Management Queensland should work together to ensure the approval process does not cause delays in delivering SMS alerts.
- wherever possible, Emergency Management Queensland should consult with local disaster management groups before sending emergency alerts to residents. Emergency Management Queensland should inform the local disaster management group, as soon as it can, about any message already sent to residents in that local disaster management group's area.
- individuals and businesses should be encouraged to acquire battery operated radios for use in emergencies.
- councils should ensure that residents are aware of the frequency of the radio station or stations in their local area that will disseminate flood warnings and other information during disasters.
- councils that have not already done so should consider how social media may be used effectively to provide accurate information about flood levels and local conditions to residents during a flood event.
- councils, with the assistance of the Bureau of Meteorology, should consider the susceptibility of their regions to flash flooding, and whether it is feasible and necessary to acquire and operate an automated local evaluation in real time system (ALERT system) for particular waterways.
- dam operators should plan to contact people identified by their emergency action plans about dam outflow in sufficient time for them to be able to respond to the information.

- dam operators should ensure each emergency action plan includes a clear statement as to the frequency of, and circumstances in which, warnings will be issued to people listed in the emergency action plan.
- dam operators should assess the effectiveness of using SMS and/or email as a bulk instantaneous communication to all people on the notification list while individually contacting those whom it is essential to inform immediately.
- the operator of each dam should, upon request, provide to any person on the notification list in the emergency action plan an explanation of the arrangements as to the type and frequency of communications required by that plan.
- operators of dams should publicise, in a newspaper circulating in the local area and by posting a notice on its website every year before the wet season, the opportunity for local residents immediately downstream of a dam to be included on the existing notification list, and:
    - consider whether an applicant for notification is so close to the dam that the warning time before water from the dam affects them is less than that available through the emergency management system;
    - consider whether they can be effectively notified by SMS or email;
    - if it is necessary to contact the applicant personally, agree with him or her a mode for that communication.
- in rural and remote areas where telecommunications are not effective, measures that do not rely on internet and mobile telephone services should be implemented to inform the travelling public of road conditions ahead, for example:
    - signs with detailed information;
    - providing tourist information centres and tourist radio stations with information on road conditions.
- the Bureau of Meteorology should endeavour to make clear the areas actually covered by its warnings, and specify what may be expected in particular areas, so that the relevance and significance of any warning is obvious to residents of the area at risk.
- councils should continue to take responsibility for issuing flash flooding warnings. However, where the Bureau of Meteorology becomes aware of weather conditions likely to cause flash flooding that is likely to endanger life or property in a particular council's region, it should, performing its functions in the public interest, directly communicate that information to the relevant council.
- councils should advise the Bureau of Meteorology of any information they possess about flash flooding (or the immediate prospect of it) likely to endanger life or property in their region, and of any warnings they issue about such flash flooding. The Bureau of Meteorology should consider in each case

whether any such warning should be re-published (whether as a warning emanating from the Bureau itself or as attributed to the relevant council) on the Bureau's website, or whether it should provide a link to any council warning or other information regarding flash flooding provided by councils or disaster management agencies.

- where the Bureau of Meteorology has information which leads it to anticipate flash flooding likely to endanger life or property in a specific area, it should publish a warning to that effect on its website.
- the Bureau of Meteorology should do its best to develop working relationships with all councils, particularly for the purpose of exchanging information in severe weather and flood events.
- the Bureau of Meteorology should expand its volunteer rainfall and river height networks to incorporate residents of the Lockyer Valley, particularly property owners living on watercourses who can provide manually obtained readings of water heights where no automatic gauge is available, or can confirm automatic gauge readings where there is concern about their accuracy.
- the Bureau of Meteorology should consider identifying amateur weather-watch groups it considers credible and likely to have useful local knowledge, and establish means (similar to those available to the storm spotters) by which they can expeditiously communicate with the Bureau.
- the Queensland Fire and Rescue Service should purchase waterproof radio equipment that:
  - is appropriate for swift water and normal fire fighting environments;
  - will attach securely to firefighters in a way that does not hamper their operations.
- the Queensland Fire and Rescue Service should work towards providing hands-free means of communications to swift water technicians for in-water operations.
- the Queensland Fire and Rescue Service should ensure that rescue technicians on deployment are provided with individual radios, rather than sharing a communications pack.
- during floods, councils should as quickly as possible provide people in the relevant areas with advice as to the location of and routes to evacuation centres.
- that advice should be given using as many mechanisms as appropriate, including text message, radio and door knocking.[20]

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20 Queensland Floods Commission of Inquiry, *Interim Report*, available: www.floodcommission.qld.gov.au/__data/assets/pdf_file/0008/8792/QFCI-Interim-Report-Recommendations.pdf (accessed 3 August 2011), pp 11, 12–14, 15 and 17.

Queensland Premier Anna Bligh has stated all recommendations relating to the Queensland state government will be implemented[21] and in the formal response to the interim report, the Queensland Government stated:

> The Queensland Government has accepted the Interim Report as a blueprint for implementation and advocates a collaborative approach in preparing for the 2011-12 wet season and beyond. The Interim Report made 175 recommendations, and detailed analysis has identified 104 recommendations for which the Queensland Government has implementation responsibility. While many other recommendations are directed towards local governments and the Commonwealth Government, these activities require a joint effort and the Queensland Government will provide support and assistance where necessary.[22]

The final report of the Queensland Floods Commission of Inquiry will be handed down by 24 February 2012.[23]

21 Premier of Queensland, *Premier's newsroom: Commission of Inquiry's interim report*, available: www.thepremier.qld.gov.au/newsroom/2011/020811-inquiry-interim-report.aspx (accessed 3 August 2011).

22 Queensland Government, *Queensland Government response to the Floods Commission of Inquiry Interim Report*, August 2011, available: http://www.premiers.qld.gov.au/publications/categories/reports/assets/response-to-flood-inquiry.pdf (accessed 23 November 2011).

23 Queensland Floods Commission of Inquiry, *Terms of Reference*, available: www.floodcommission.qld.gov.au/terms-of-reference (accessed 20 June 2011).