

Submission Number: NND.001.01322

Submission Of: Tim Herne

Your Details

Email address:

Phone:

Preferred means of contact: Phone

What is your submission based on? I am making this submission based on my personal situation

What was your personal situation in relation to the 2019-20 Bushfires?

Where do you live? Eurobodalla (A)

Your Submission

In your experience, what areas of the bushfire emergency response worked well?

Nothing of significance to add.

In your experience, what areas of the bushfire emergency response didn't work well?

Nothing on significance to add

In your experience, what needs to change to improve arrangements for preparation, mitigation, response and recovery coordination for national natural disaster arrangements in Australia?

Proposal to assist emergency information dissemination:

Utilise the AM broadcast band as a supplementary & robust method to inform the community during an emergency situation.

Rationale

AM broadcast radio is the most robust public communications technology available to reliably disseminate information over regions in an emergency. (The technical and practical reasons for this are identified below.)

This proposal is not to say that other communication technologies should be ignored or abandoned. On the contrary broadcast FM & digital radio, Terrestrial & Satellite television, fixed & mobile internet (websites, apps, e-mail, Facebook groups, etc), mobile phone (both SMS text & voice), landlines, etc all have a vital role & unique attributes in disseminating information to the community & between people during an emergency. The communication mediums of speech, text, video & graphics important in reaching people with different preferred communication styles and information needs.

However, as occurred during the firestorm impacting the Batemans Bay district on 31 December 2019 and in the days following all of these other communication technologies failed for one reason or another. They are not fundamentally reliable in an emergency situation. Hence the need for the more robust technology of 'old fashioned' AM radio.

The technical case - what is it about AM radio that makes it more robust, and thus more suitable in an emergency, compared to other mainstream communication technologies.

In short: Transmitter siting; Coverage area; Reception

Transmitter siting

AM radio transmitter sites are standalone & not co-located with other broadcast infrastructure.

The technicalities of AM radio results in its best transmission sites being located on flat ground - ideally boggy in nature & cleared of tall vegetation. Three factors which dramatically reduce fire & access hazards. Other hazards such as flooding can be mitigated by building transmitter huts above the water level. The winds of cyclones mitigated by suitably engineered transmitter buildings, mast & stays.

The type of sites which best suite AM radio are fundamentally unsuitable for FM radio, digital radio or DAB+ (Digital Audio Broadcasting), digital television, mobile phone call & data, telephony microwave repeater stations, etc. These services require an elevated position to maximise the coverage area or signal reach. Because of this common need many of these broadcasting & communications services share infrastructure to reduce costs and visual clutter.

For example: In Sydney, three broadcast towers in the lower North Shore provide this elevated position for television, FM radio, DAB+. In Canberra, Black Mountain (AKA Telstra) Tower is the primary site for television, FM radio, DAB+, mobile phone & data, telephony repeater stations, emergency services (Police, Ambulance, Fire), etc.

Whereas, in Sydney the AM radio transmitters are located near the Olympic precinct & Liverpool. In Canberra they are adjacent to the suburb of Mitchell.

In regional and rural areas, FM radio, television and other communications services are frequently located atop the tallest mountain in the

district served so as to achieve the required elevation. Often this mountain is in a heavily forested area with access roads and power supply lines weaving through many kilometres of bushland. Again, common siting of different organisation's transmission infrastructure reduces costs. However, being atop of a mountain in bushland is a very high fire risk. This high risk environment is a single point of failure for all the co-located services.

As confirmed by an ABC spokesperson:

'Broadcast towers remain the "weakest link" during emergency broadcasts, the ABC's head of content management Rebecca Matthews warned, because the infrastructure is vulnerable to fires.' <https://www.smh.com.au/politics/federal/life-and-death-abc-battles-to-restore-damaged-networks-during-bushfires-20200111-p53qmi.html>

This is the case on the South Coast with radio & TV broadcasting infrastructure servicing Batemans Bay, Mogo, Malua Bay, Tomakin, Broulee, Mouyra & nearby coastal hamlets atop of Mount Wandera - 12.5Km to the west of Mogo. On its way to decimate Mogo & Malua Bay, the Clyde Mountain Fire destroyed the power lines supplying the transmitters and severely damaged the transmission facility itself. Taking FM radio & television broadcasts off-air just when the local community needed critical emergency information the most.

This was not an isolated incident with Mallacoota also losing its radio & television broadcasting services on New Year's Day during its fire emergency.

Many mobile phone towers, which also support mobile & fixed internet access, were also either totally destroyed by fire or lost mains power due to damaged power lines.

On-site batteries & generators kept some sites operational for a time but eventually even these vital communications links were lost as charge & fuel was used up.

These broadcast and mobile phone & data facilities were not able to be quickly restored as both the access tracks were blocked by fallen burnt trees & personnel being injured or killed by falling trees was deemed high risk.

(Radio & TV) services in nearby Genoa and Cann River lost power and technicians have been unable to access the facilities because of 150 kilometres of road being carpeted with burnt trees. <https://www.smh.com.au/politics/federal/life-and-death-abc-battles-to-restore-damaged-networks-during-bushfires-20200111-p53qmi.html>

There isn't an AM broadcast transmitter in the Batemans Bay district. Had there been one it would not be located at Mt Wandera so it would not have simultaneously failed along with the other services. The community would still have been able to receive critical emergency information.

It is the completely separate location of AM transmitter sites which provides a very high level of redundancy for community emergency communications systems. It is this redundancy which provides total system robustness.

Coverage area

Amplitude Modulation has a greater successful reception distance from the transmitter compared to FM radio, DAB+ & terrestrial Digital TV signals - especially so with portable receivers in valleys.

Southern Cross Austereo CEO Grant Blackley acknowledged these technical differences in an interview with the Sydney Morning Herald published 14 February 2020.

"AM radio ... works well over long distances ... FM frequencies are less prone to interference but have a shorter range."

This unique attribute of AM radio both ensures reduced black-spots in reception fringe areas and, most importantly, a higher level of redundancy in event of catastrophic failure of all broadcast radio & TV, mobile phone & data infrastructure serving a geographic area.

In this event, a listenable (albeit noisy) signal can be received from AM radio stations in adjacent regions. Depending on transmitter power, this can be hundreds of kilometres away. This ability to project a reassuring communications lifeline into a nearby district during an emergency despite local infrastructure decimation is unmatched by all other readily available technologies.

This is particularly the case with DAB+ radio & digital TV. Coverage areas are very defined - either enough signal is received for perfect sound (& vision) or it isn't. In which case usually nothing can be reliably heard (or seen.) This effect is called the digital cliff.

The digital cliff makes it very difficult to reliably receive DAB+ radio & digital TV outside of a core coverage area. Thus digital broadcasts cannot be utilised to reach into adjacent regions.

Reception

The inherent advantage for a mature technology like AM radio is that there are abundant radio receivers already in the community. Battery powered radios, as recommended by State Emergency Agencies, are readily available & cheap to buy if not already on-hand. Comparatively, newer technologies like DAB+ has a much lower number of receivers - especially in regional areas

Battery powered radios were essential in the aftermath of the 31 December firestorm on the South Coast as many areas remained blacked-out for weeks afterwards. In these weeks firefronts were still threatening towns & villages in the region so situation reports were critically important for these residents. For people already impacted, information about local emergency support services at evacuation centres helped them obtain much needed assistance.

Another aspect of reception, when forced to use battery power, is battery life. The analogue circuitry in the tuning & amplification sections of portable AM radio units is far less demanding on batteries than portable DAB+ digital radios. As batteries flatten, the volume control on the radio can be increased to compensate giving extended listening time.

In contrast, the digital processing circuitry in DAB+ radios tends to be harder on battery life. Additionally, once the voltage in the batteries is

drained to a particular point the digital processing circuitry will suddenly no longer work. The combined effect of both these limitations is noticeably reduced listening time per set of batteries compared to an all analogue unit.

The longer useable battery life of analogue technology like AM is a significant advantage when retail stocks are finite within a disaster impacted area.

Practical considerations

To enable this emergency communications proposal, key extant AM transmitter infrastructure should be reserved by the Federal Government exclusively for this purpose. Regional areas currently not adequately served by a nearby transmitter should have new facilities built so as to provide clear reception. The transmitters themselves could be relocated from cities currently hosting two or more stations.

This would require the Commonwealth Government to facilitate the moving of many ABC and commercial broadcasters from the AM to the FM & DAB+ bands. There is a public benefit to this move as it will provide an enhanced listening experience from stereo sound & wider frequency response when those stations are on the FM band. The broadcasters required to move bands would no doubt appreciate the removal of a technological divide between them and some of their competitors. Being on the FM band gives much wider long-term programming options than being restricted to mainly 'talk' formats on the mono AM band.

To save operational costs, these AM transmitters would be switched off when not required. The exception being during regular scheduled testing for operational readiness.

The frequency that should be tuned to can be notified by roadside signs which would be seen by locals & visitors alike. Canberra being a good example with signs on all major roads stating: In an emergency tune to 666 AM.

The service provider for the emergency broadcast network should be the ABC. The ABC already provides this service, having the necessary local & national resources which can be scaled up as required. The ABC has developed very high community trust from its role in previous emergencies & is seen as the official broadcaster in these situations.

Counter argument to Commercial Radio's call for the Federal Government to fund digital radio to supplement emergency broadcasting <https://www.smh.com.au/culture/tv-and-radio/radio-wants-speedy-digital-roll-out-to-assist-with-emergency-broadcasting-20200213-p540je.html>

The role of local commercial radio supplementing the ABC in the provision of emergency information is essential. However, Commercial Radio Australia's plan for this supplementation to be delivered via digital radio is fundamentally flawed for the technical & practical reasons outlined earlier in this submission.

Instead of the Federal Government spending \$80M on a system which has a much higher likelihood of failure when needed most, the more robust solution is to invest this money into organising Australia's existing fleet of AM broadcasting transmitters into a dedicated emergency information broadcast network.

Details, for more information if required:

Name: Tim Herne

Phone: [REDACTED]

Standing: Resident of Batemans Bay. Experienced being impacted by fire on 31 December 2019 & subsequently threatened by fire twice in the days after.

Previously resident of Canberra. Affected by the 2003 firestorm.

Worked in the program production & technical areas of radio broadcasting for 10 years.

Is there anything else you would like to tell the Royal Commission?

Nothing of significance to add

Do you agree to your submission being published? Yes I agree to my submission being published in my name

