

Submission to the NSW 2020 Bush Fire Inquiry.

EXECUTIVE SUMMARY

- This submission is based on my experience as a volunteer Communications Operator at both the Kempsey and Wauchope Fire Control Centres (FCC) during the 2019-2020 Bush Fire crisis.
- Whilst I believe all major carriers in Australia are affected by the same issues, I can only personally comment on my experience with the Telstra network.
- Apart from those mobile cellular phone sites that failed due to the main AC power lines being affected by fires, I believe many more sites were affected by poor configuration parameters set by a poorly trained technical workforce.
- As an example, it was virtually impossible to make a mobile phone call from within the Kempsey RFS FCC despite the fact that the main Telstra cell site at the Kempsey Telephone Exchange was only 2.4Kms away. Whilst reception was marginal outside the building, a call could generally be successfully completed.
- I believe the main issue affecting many Telstra cell sites is that the equipment is set to use metropolitan “power back-off” settings. Power Back-off causes the transmit power of the cell site to be reduced as the call density increases. I have heard anecdotal comment that this occurs in the Optus network as well.
- Despite being a Telstra Business Customer at the time, it was impossible to access Australian Telstra Mobilenet personnel to report problems. The only Telstra Mobilenet staff contactable were in the Call Centre in India. These staff, in my opinion, had only base level technical knowledge.
- I do not expect the inquiry to raise my specific personal issues with Telstra. Rather, I am bringing these issues to the attention of the Inquiry to enable Inquiry members to question the Carriers about their apparent indifference to adequate technical training of their Field Service personnel and the appropriate configuration of mobile phone cell sites, particularly those in rural areas.

Submitted by Bob Ecclestone
22nd May 2020

Background

I have prepared this submission to bring the parlous state of the Australian Mobile Phone Networks to the attention of the Inquiry Members. I believe these conditions resulted in much of the very poor, or non-existent, mobile phone coverage in many of the fire affected rural areas of Australia, including much of NSW.

I believe this condition is often due to the incorrect configuration of equipment within the mobile phone cell sites. I further believe these configuration issues are largely due to the generally poor training and/or understanding of Field Service personnel.

Technical Issues

Backhaul

Backhaul is the connection between the cell site and the carrier network backbone. This was typically provided by dedicated point-to-point microwave radio links in the past, however with the advent of 4G, this has been increasingly provided with fibre optic links. Fibre has a much higher intrinsic data capacity in terms of Megabits or Gigabits per second than microwave radio. This higher data capacity translates to more concurrent voice calls as well as supporting more video and data connections. However, fibre is more expensive to deploy over mountainous terrain and is sometimes impractical to deploy in these areas. These sites are then served with lower capacity microwave radio links.

Power Back-off

Power back-off is a feature of mobile phone cell sites that reduces the transmit power of a cell site as the number of calls and/or the data throughput increases. This limits the effective range and hence the number of calls that can be handled by the cell. Backhaul capacity also affects power back-off. If the cell detects it is running out of backhaul capacity, it will reduce transmit power to limit the range and hence the number of concurrent connections.

This problem becomes serious on more remote rural cell sites served by microwave radio links as people start to live stream video of local events or even just send MMS messages with pictures attached.

Power back-off is also a function of the cell site location within the network. In metropolitan deployments where there are a number of cell sites overlapping one another, the power back-off is more aggressive as call throughput increases allowing the cell to maintain high data rates to local users. Customers on the fringe of one cell will likely be picked up by, or "handed off" to, another nearby cell.

In rural, or outer metropolitan areas, the power back-off is set to a less aggressive setting to maintain a higher transmit power level and so maintain better range. The problem arises when equipment in these areas is installed, or replaced, with the default metropolitan configuration settings.

We now have situations like those experienced in Kempsey where a call is marginal over an unobstructed path length of less than 2.5kms despite having a fibre backhaul.

Poor Maintenance

When my local cell site at Rudder Park in Lord Street, Kempsey, NSW failed over a period of six weeks in early 2019. The failure resulted in numerous disruptions to many businesses in the Kempsey CBD as the failure caused the cell to lock a handset to itself

but could not connect the call to the backbone. This locked the handset out of being able to connect to the other site at the exchange in Elbow Street in Kempsey.

The failure was due to a faulty airconditioning unit in the equipment hut. The temperature in the hut was over 60C, a temperature far too high for correct operation of the equipment. My attempts to contact anyone in Telstra with any technical expertise were fruitless. The only people I was able to contact were Call Centre staff located in India. Unfortunately, these staff had limited technical skills and were not in a position to escalate the problem.

When I spoke to the airconditioning technician who finally installed the new airconditioning unit, he told me the building was overloaded thermally due to progressive equipment upgrades. When the airconditioning company had recommended to Telstra that a larger unit should be installed, they refused the recommendation. The cost difference would have been in the vicinity of \$500, however Telstra is now run by accountants rather than engineers and the site is in danger of failing again in the next heatwave.

Further Information

Due to time constraints, I am not able to add any more detail at this time.

I would be happy for a representative from the Inquiry to contact me at a later date should you require any further information.

Recommendations

1. The Inquiry question the Australian Mobile Phone Carriers individually about the specific configuration settings used in both metropolitan and rural mobile phone cell sites.
2. The Inquiry question the Carriers individually about the level of training of their Field Service personnel. Specifically about the degree of understanding of the various cell site equipment configuration settings.
3. Request Manufacturer and Carrier documentation for the configuration of Cell Site Equipment and compare them for appropriate compliance.
4. Carriers be required to provide longer battery operation on cell sites at elevated risk of losing AC mains supply due to fire, flood or other unforeseen causes.
5. Carrier backhaul capacity be compared to recommended power back-off settings.
6. The Inquiry request the ACMA consider making it a requirement that Carriers make senior Australian mobile network technical personnel available to Australian customers for high level problem reporting and resolution.

About the Author

Bob Ecclestone has been involved in the electronics and broadcast industries since 1963. He has worked in the areas of design, manufacture, operation and maintenance of telecommunications, broadcast electronics, process control systems and IT equipment. He was a Senior Network Specialist at TransACT, a pioneer broadband provider in the ACT now owned by iiNet, a subsidiary of TPG. He had extensive experience providing top level Technical Support to the company's Help Desk and often interacted with customers. He has been a licenced Amateur Radio Operator for 50 years. He is an active member of WICEN, an amateur radio specialist Communications Squad of the NSW Volunteer Rescue Association (VRA) and a Communications Specialist with the NSW State Emergency Service (SES).

He holds an Honorary Master of Science degree from the Canberra College of Advanced Education, now the University of Canberra.

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