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Dear Mark,

Ref: ACMA proposal to amend the Notification that the Australian Communications and Media Authority prohibits the operation or supply, or possession for the purposes of operation or supply, of specified devices

Telstra welcomes the opportunity to put its position in regard to ACMA's proposal to amend **the Notification** (*Notification specifying the prohibition of operation or supply, or possession for purposes of operation or supply, of jamming devices*).

At the outset, Telstra would like to make clear that it supports the development of appropriate arrangements to enable the use of cellular mobile devices in aircraft to send and receive mobile communications.

However, as the operator of the largest licensed wireless telecommunications networks in Australia potentially at risk of serious interference from such jamming devices, Telstra has a major stake in this matter. Other wireless network operators are likely to have similar concerns. This is particularly the case where carrier mobile services play a significant role in providing public access to national security, law enforcement and emergency service organisations – noting that approximately two thirds of all calls to the Telstra 'Triple Zero' emergency service are now made from mobile phones.

As a consequence of its involvement in the recent Australian trials involving Qantas and Aeromobile, Telstra is quite familiar with most aspects of the design and operation of the on-board pico-cell equipment being considered for the provision of in-flight GSM services and which are the subject of the proposed amendment.

Purpose of on-board wideband noise device

In its proposal to amend the Notification, ACMA appears to suggest that certain devices otherwise subject to the prohibition (devices known by the acronym **CRFMU** - Cellular RF Management Unit, in the case of systems supplied by Aeromobile AS) and associated with the in-flight GSM services, are intended to 'facilitate' the service on board an aircraft. Telstra disagrees with this 'service facilitation' characterisation of

the CRFMU device, and therefore contends that the proposed amendment of the Notification is not founded on fact.

As previously explained to Telstra by Aeromobile, the purpose of the CRFMU device is to create a wide-band low-level noise signal to deliberately degrade cellular mobile signals originating from terrestrial base stations, so as to force customer handsets (active within the aircraft cabin) to 'roam' onto the on-board GSM pico-cell service owned by Aeromobile.

In the absence of the CRFMU device, Telstra suggest that the on-board GSM pico-cell would not be inhibited from operation, but can continue to provide an alternative 'roaming' service to customer wireless handsets should those handsets otherwise determine a need to roam away from the customer's home network service.

In that context, the CRFMU is a device aimed at forcing all customer handsets to roam exclusively onto the Aeromobile service, irrespective of the presence of sufficient quality signals from the customer's home network service. It is therefore technically incorrect to describe it as a device for "facilitating service on board an aircraft".

More specifically, the CRFMU device is deliberately aimed at allowing anti-competitive behaviour in capturing customers that may otherwise choose not to roam to the Aeromobile service.

Telstra contends that a legislative amendment to formally authorise the forcing of customers to "roam" onto a single provider where other wireless networks are capable of being accessed is not appropriate and may constitute an anti-competitive arrangement in conflict with other existing law (ie. *Trade Practices Act 1974*).

Protection of on-board avionics systems

With aircraft operators now indicating comfort with on-board pico-cell systems, including the operation of wide-band noise devices (such as Aeromobile's CRFMU), Telstra questions the veracity of historical claims that active mobile handsets within the aircraft cabin pose a threat to the safety of aircraft and their avionics systems.

Now, with the wider use of mobile phones (and other wireless devices) being encouraged by the installation of on-board pico-cells, plus the continuous wideband emissions of the noise device (CRFMU), if any interference risk did exist it should equally arise in relation to the proposed on-board pico-cell systems.

Further, while mobile phones are specifically designed in accordance with very strict adjacent channel emission constraints, and are constrained to just a few well-defined bands of operation, the wide-band noise device (CRFMU) is deliberately designed to emit an interfering signal across a wide swathe of the spectrum ranging from about 820 MHz to 2170 MHz and possibly higher.

Therefore, Telstra concludes that either negligible interference risk from mobile phones occurs in reality, or that there must be an equally concerning interference risk arising from operation of the on-board pico-cell system itself - and especially from the wide-band noise device (CRFMU).

Implications for current Spectrum Licensees

Telstra further notes that current Spectrum Licences covering the bands 825~845/870~890 MHz, 1710~1785/1805~1880 MHz and 1900~1980/2110~2170 MHz have already been issued on the basis of no altitude boundary within the territorial limits of the Australian continent. Thus, the utility of the spectrum assigned under these licences extends to the atmospheric boundary with Outer Space - allowing for the potential deployment of High Altitude Platform Stations (HAPS) operating via stratospheric aerial platforms to provide wide-area rural/remote service coverage.

As part of Telstra's involvement in the recent technical and operational trials with Aeromobile and Qantas, ground tests of emission levels outside of the aircraft body were undertaken. These tests indicated that while emission levels were relatively low, the effect of cabin window apertures did appear in some circumstances to replicate the performance of a relatively inefficient antenna array. As such, there was some leakage of emissions outside of the aircraft cabin and, with the high sensitivity and low noise temperature expected of wide-area HAPS receiver systems, Telstra is concerned to ensure that strict emission limits are applied to airborne cellular pico-cell systems. These limits should apply in addition to Telstra's recommendation that authorisation not be granted for use of on-board wideband noise devices (CRFMU).

Suggested conditions and recommended maximum emission limits

In particular and as previously indicated to ACMA, Telstra recommends that the following conditions and emission limits should apply to airborne cellular pico-cell systems fitted to commercial aircraft operating within Australian airspace:

1. In the event that the link/s is lost between the on board pico-cell, Aeromobile network and/or the "home" terrestrial network of the customer using the on-board facility, the pico-cell will allow direct connection to the "home" terrestrial network of the customer.
2. In the event of a life threatening or national security situation on board or in the vicinity of the aircraft, the pico-cell will allow direct connection to any available terrestrial network.
3. GSM pico-cell transmitting devices fitted on-board commercial aircraft shall not be active at any time while aircraft are operating below 6,000m AGL in Australian airspace.
4. The pico-cell will employ automatic mechanisms to comply with this minimum altitude limit to avoid reliance on aircraft crew members for activation and de-activation (i.e. to avoid human error).
5. Radiofrequency emissions by GSM pico-cell transmitting devices fitted on-board commercial aircraft shall not exceed +6 dBm (total signal power in any 5 MHz bandwidth);
6. Antennas employed by GSM pico-cell transmitting devices on-board commercial aircraft shall be limited to radiating cable type, with a minimum mean coupling loss of 69 dB at 2m range - no 'panel' antennas, or other discrete radiating element antennas, shall be used for any wireless services on board aircraft.

7. Radiating cable antennas connected to pico-cell transmitting devices fitted on-board commercial aircraft shall be mounted in such a way as to constrain emissions as much as possible to within the aircraft cabin.

For all of the above reasons:

- 1. Telstra strongly recommends that the wide-band noise device (CRFMU) not be authorised by amendment to the subject Notification; and**
- 2. Telstra recommends that wireless pico-cells and handsets can be used in aircraft subject to the agreement of the relevant aviation authorities.**

We trust that our response to ACMA's consultation on this matter will assist ACMA to determine a rational regulatory position. Telstra would welcome further discussion on these issues, should that be seen as helpful to ACMA's review of these matters.

Yours sincerely,

A large black rectangular redaction box covering the signature of the sender.

Manager – Radio Spectrum Strategy