



FreeTV
Australia

Submission by Free TV Limited

Australian Communications and Media
Authority

*Amendments to the Technical Planning
Guidelines for the planning of individual
services that use the Broadcasting Services
Bands*

By
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EXECUTIVE SUMMARY

- This current revision of the TPGs is just one of a number of revisions to the ACMA's (formerly ABA) broadcasting planning reference documents and that Free TV (and its predecessor organisations) have been involved in these ongoing review activities.
- The unassigned channels have been planned to provide DVB-T services to receivers using fixed outdoor antennas. We identified no planning has been done for delivery of services to mobile or portable receivers. As such, the use of Channel B for mobile television services presents a number of challenges, in particular the significant potential for interference to existing television services.
- Free TV notes the changes proposed are quite specific and relate to the proposed sale of Datacasting Transmitter Licences A and B.
- It is imperative that the introduction of mobile television services in Channel B is carefully and cooperatively researched and planned to ensure new services do not compromise the availability and quality of free-to-air television services and disrupt the smooth transition to digital television services for all Australian viewers.
- Free TV requests that the TPGs be amended to refer to Appendix C of the DTTB Planning Handbook. That is, the derivation of the protection ratios for the unwanted image channel (18dB) and the derived ratio of wanted to unwanted of 13dB.
- Free TV notes that the issue of non co-sited transmitters is yet to be addressed by ACMA in relation to amendments to the TPGs. Free TV considers the protection ratio for the immediate adjacent channel in a 7MHz may need to be reduced. Free TV requests ACMA to undertake further studies to confirm this.
- Free TV requests ACMA undertake a general review of definitions in the TPGs to ensure that changes to the document have been captured. We suggest that some of the definitions should be amended.
- Free TV acknowledges the results of the review undertaken by the ABA in 2003. In large measure, the suggestions made by the then Commercial Television Australia were taken into account by the ABA into the current version of the TPGs, but there are a small number of issues which appear to still be valid.
- Free TV members are working with ACMA and DCITA to identify issues surrounding the legislative requirements of "same coverage" as applied to digital services with comparison to that provided by analog transmissions.
- Free TV and its members remain committed to monitor and participate in tasks which result in future reviews as a result of emerging documentation (including RRC-06 texts, ITU-R texts and revised standards) to see if and where the current Australian DTTB Planning Handbook may also require revision.



INTRODUCTION

Free TV (**Free TV**) is the peak industry body representing all of Australia's commercial free-to-air television licensees.

Free TV welcomes the opportunity to comment in response to the Consultation Paper, Amendments to the *Technical Planning Guidelines for the planning of individual services that use the Broadcasting Services Bands*, released by the Australian Communications and Media Authority (**ACMA**) in March 2006.

ACMA has sought comment on proposed revisions to the Technical Planning Guidelines for the planning of individual services that use the broadcasting services bands (**TPGs**). The amendments proposed by ACMA relate specifically to the proposed sale of datacasting transmitter licences (**DTLs**) in Channels A and B in the unassigned channels of each Digital Channel Plan (**DCP**).

Free TV outlined a number of planning issues regarding allocation of DTLs in the unassigned channels in its previous submission to ACMA in response to the Discussion Paper, *Allocation of spectrum for new digital television services*, released in December 2006

The unassigned channels have been planned to provide DVB-T services to receivers using fixed outdoor antennas. No planning has been done for delivery of services to mobile or portable receivers. As such, the use of Channel B for mobile television services presents a number of challenges, in particular the significant potential for interference to existing television services.

ACMA's proposed amendments to the TPGs appear to be based on the following principles:

- a) the proposed services in both Channel A and B will operate like the same technical characteristics of the digital television service.
- b) the new licensees will be BSB licensees;
- c) the planning principles for both channel A and B are the same as those that have been applied to all other DCP channels;
- d) while the service area boundaries are yet to be defined, they will be one or more areas each served by a transmitter operating in accordance with the provisions of the DCP in each area.

Free TV welcomes these principles.



It is imperative that the introduction of mobile television services in Channel B is carefully and cooperatively researched and planned to ensure new services do not compromise the availability and quality of free-to-air television services and disrupt the smooth transition to digital television services for all Australian viewers.

Broadcasters are now at a critical stage of the digital transition. The Australian public relies heavily on over-the-air transmission of television services. At least 75% of Australian TV homes rely exclusively on free-to-air television services delivered via the Broadcasting Services Bands (**BSBs**) with at least 25% of households now capable of viewing free-to-air digital channels and consumer sales increasing rapidly. However, as we near completion of the roll-out and analog switch-off, coverage gaps (where a snowy picture in the analog world is replaced by a black screen in digital) and in-fill spectrum needs for digital television services will need to be addressed in preparation for removing the established "tiers" of analog services of primary transmission, translators and black-spot services.

At such a critical stage, the implementation of new services has the potential to create interference to hundreds of thousands of viewers, and have major financial impacts on broadcasters so these changes to the TPGs need to be examined very carefully.

This submission makes comments on certain issues raised in the Discussion Paper under the following sections:

Section 1: Proposed editorial revisions arising from the ACMA Consultation Paper. This section outlines some further issues that we suggest ACMA consider in this review.

Section 2: Matters arising from the ABA's revision of the Technical Planning Guidelines in 2003 and the DTTB Planning handbook in 2004. This section identifies a number of issues raised by the then Commercial Television Australia Ltd. in 2003 and Free TV in 2004.

1 Proposed editorial revisions arising from the ACMA Consultation Paper

The substantive changes outlined in ACMA's Consultation Paper have the effect of:

- a) clearly indicating that the TPGs apply to digital datacasting services;
- b) actually improving the protection provided to existing free-to-air television services, by:
 - (i) applying the "change of site" provisions to sites established at locations other than those included in DCP's (that is, effectively sites other than existing transmitter sites)
 - (ii) defining explicit requirements to protect existing analog services (new guidelines 94A and 94B) and existing digital services (new guidelines 100A and 100B).

We welcome these changes. We request ACMA also consider the following changes.

1.1 Protection Ratios

In relation to Clauses 94A and 94B the current edition of the DTTB Planning Handbook identifies in Table C.1 that the protection ratios (dB) for a DVB-T 7MHz signal interfered with by an Image Channel 7MHz DVB-T signal is unavailable. The reference given is Recommendation ITU-R BT.1368-4. Earlier versions of the DTTB Planning Handbook (cite 1999) the value applied was -30dB.

Free TV notes that in recent studies conducted in the UK have shown that DTT receivers (e.g. set-top boxes) are prone to interference from other channels.

These studies have illustrated the typical sensitivity of DTT receivers to signals in adjacent and other channels. In addition to the immediately adjacent channel ($n \pm 1$), the so-called 'image channel' ($n + 9$) is also susceptible to interference from transmissions in this channel. This vulnerability of the DTT receivers means that, for a particular channel, if a transmitter site (for DTT or any other service) were deployed in an adjacent channel ($n \pm 1$) or image channel ($n + 9$), there may be an area around the transmitter site where that DTT channel could not be received¹. The protection ratio identified in this study for the image channel is ~ -34 dB.

In another study² which considered where a DVB-H, or other mobile broadcast service requiring high field strength levels, was implemented in spectrum adjacent to an existing DVB-T service, results identified it would be possible for the DVB-H service to 'punch holes' in the DVB-T coverage. This report states *The practical consequence is that it may be necessary to assume that the 'hole-punching' interference mechanism described above may not be limited to near-adjacent channels.*

¹ Refer http://www.ofcom.org.uk/consult/condocs/ddr/report_analysys/

² Refer http://www.ofcom.org.uk/consult/condocs/ddr/report_analysys/

The phenomenon of *hole punching*³ is discussed in both these studies. The latter study identifies *A different situation will obtain where wanted and adjacent transmissions are made from different sites. The possibility then exists that the wanted signal is relatively weak, perhaps at the edge of coverage of a distant transmitter, while the adjacent signal may be from a very local transmitter. In this case, there is a real possibility that the >-28dB protection ratio will be exceeded.*

As a result of these findings Free TV requests that the TPGs be amended to refer to Appendix C of the DTTB Planning Handbook. That is, the derivation of the protection ratios for the unwanted image channel (18dB) and the derived ratio of wanted to unwanted of 13dB.

1.2 Non Co-sited Transmitters

Free TV notes that the issue of non co-sited transmitters is yet to be addressed by ACMA in relation to amendments to the TPGs. As a result of the studies referenced above Free TV considers the protection ratio for the immediate adjacent channel in a 7MHz may need to be reduced. Free TV requests ACMA to undertake further studies to confirm this.

Guidelines 94B and 100B indicate that case-by-case treatment would be required for interference from non-co-sited transmissions. It is not clear how these situations will be dealt with. It is important to understand the principles that ACMA will apply before any licences are issued.

1.3 Application to Datacasters

We welcome the amendments proposed by ACMA to clarify the application of the TPGs to digital datacasting services. These ensure that datacasting transmitters are located within the datacasting service area boundary thereby preserving the integrity of the digital channel planning process.

Free TV also welcomes ACMA's changes regarding signal level variability.

1.4 Definitions

Free TV requests ACMA undertake a general review of definitions in the TPGs to ensure that changes to the document have been captured. We suggest that some of the definitions should be amended, including:

- a reference to the *General Approach to Digital Terrestrial Television Broadcasting Planning*.

³ Hole-punching occurs when a receiver suffers interference from a local transmitter operating on a channel adjacent to the wanted signal.

- inclusion of *Radiocommunications services* as a definition rather than an incidental note (as it is referred to six times in the document).

We also suggest the following editorial corrections:

‘reference television receiving system’ means a television receiving system comprising a receiver and an antenna system. For analog television systems the reference television receiver is defined in Attachment 35C.BB of *Technical Planning Parameters and Methods for Terrestrial Broadcasting*. for Digital Television systems the reference television receiver is defined in Appendices B and E of the *Digital Terrestrial Television Broadcasting Planning Handbook*, supplemented by data on antenna directivity discrimination and orthogonal wave polarisation discrimination from in Attachment 35C.BB of *Technical Planning Parameters and Methods for Terrestrial Broadcasting*;

In addition the definition of the reference television receiving system by cross-reference to multiple sources suggests that an additional Appendix containing the notional receiver specification would be useful.

“Digital Channel Plan or (DCP)” means an instrument, developed by ACMA under:

Could probably be amended as shown:

(b) the National Television Conversion Scheme 1999 (as amended) formulated under subclause 19(1) of Schedule 4 of the Broadcasting Services Act 1992, that determines which channels are to be allotted in each area, the technical limitations and characteristics of those channels, and the channel assignments - either to broadcasters, **datacasters** or as “unassigned” channels;

2 Matters arising from the ABA’s revision of the TPGs in 2003 and the DTTB Planning Handbook in 2004.
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Free TV requests that ACMA consider making the following further changes to the TPGs, which were requested by Commercial Television Australia in earlier reviews.

a) ABA’s revision of the TPGs in 2003

Free TV acknowledges the results of the review undertaken by the ABA in 2003. In large measure, the suggestions made by the then Commercial Television Australia were taken into account by the ABA into the current version of the TPGs, but there are a small number of issues which appear to still be valid:

- (i) Confusion regarding the use of the term “urban centre and an apparent misunderstanding of this term and confusion with the concepts of “urban”, “suburban” and “rural” areas for of “urban”, “suburban” and “rural” areas for the purposes of signal strength planning. “Urban centre” is a term used by the Australian Bureau of Statistics (**ABS**) in reporting census data etc and essentially means a centre of population and is included in the TPG definitions. It is noted that an “urban centre” is typically a cluster of 1000 people or more. As such, an “urban centre” may exist in any of the “rural”, “suburban” or “urban” zones as used for field strength definition purposes. The ABS term is used because licence areas are defined by reference to ABS statistical areas.

Accordingly, use of the concept of “urban centre” in the TPGs associated with interference protection is intended to ensure that protection is provided across rural, suburban and urban areas.

- (ii) Guideline 12 applies the TPG start-up procedures to licensee’s planning to establish, or to change the technical specifications of, a broadcasting or datacasting service. This guideline does not appear to apply to “drop-through” licensees who may be operating any other type of service in the Broadcasting Services Bands (BSBs). Since any service operating in the BSB’s is potentially liable to cause interference to existing broadcasting services, then it seems appropriate to apply the TPG start-up procedures to all services operating in the BSB’s.

Although the general interference avoidance provisions of the Radiocommunications Act would apply to services other than broadcasting or datacasting services that are operating in the BSB’s (drop-through’s), it would seem appropriate to impose the additional requirements of the TPGs in recognition of the use of BSB spectrum.

- (iii) Tables 5.1 and 6.1, which provide minimum field strength targets for analog and digital services respectively, are only indirectly referenced in the associated text. It is proposed that Guideline 60 should directly refer to Table 5.1 and Guideline 84 should refer directly to Table 6.1.
- (iv) There is the potential for confusion and uncertainty to arise from the use of the terms “planned minimum field strength” and “minimum median field strength”. Planned minimum field strength is defined in the TPGs, but “minimum median field strength” is not. The term “minimum median field strength” is used as the caption for Table 5.1 and 6.1, but it would seem that the defined term “planned minimum field strength” should be used to caption these tables.
- (v) Guidelines 105 and 106 address the establishment of SFN or additional co-channel transmitters for the purposes of addressing inadequate coverage – that is, in-fill transmitters. These provisions make the licensee responsible for managing any internal interference that arises from such operation. However, in rural and regional areas, many in-fill transmitters are provided by local communities on a self-help basis and the parent licensee has no control over the operation of such transmitters. Accordingly, it would appear to be impractical to expect that self-help in-fill transmitters could be operated either as an SFN or as a co-channel transmission with the parent signal. Free TV proposes the Guidelines or the associated notes should be amended to indicate the impracticality of establishment of self-help services using either SFN or co-channel transmission.
- (vi) Clause 19 of Appendix 3 to the TPGs (Emission Standard – Analog Television) refers to the specification of teletext signals and makes reference to an old Department of Transport and Communications document. Free TV submits it is appropriate to replace this reference with more recent sources such as the Australian Standard and Free TV Operational Practice documents.

b) ABA’s revision of the DTTB Planning Handbook in 2004

Free TV members are working with ACMA and DCITA to identify issues surrounding the legislative requirements of “same coverage” as applied to digital services with comparison to that provided by analog transmissions.

Free TV acknowledges, while this can be expected to change over time, we do not yet have available either the measurement technology or the coverage modelling software that is needed to accurately characterise the coverage actually delivered by either analog or digital transmissions.

The existing TPGs currently define minimum median field strength (also called “planned minimum field strength”) values for analog television at Table 5.1 associated with Guideline 60 and for digital television in Table 6.1 (associated with Guideline 84, but following Guideline 85 in the document).

In the context of the requirement at Guideline 82 that SDTV digital transmissions achieve the same coverage as the analog services in the same area, the only mechanism that exists to judge this is the achievement of the



minimum digital signal levels of Table 6.1 at the same locations as the analog service achieves the minimum signal levels given in Table 5.1. In the general case, the transmitter ERP limits set out in the respective DCP's are intended to achieve this matching of signal levels, at least around the peripheries of existing analog transmitter coverage areas. It goes without saying that the pattern of actual coverage achieved by digital will be different from that of analog, but at the present time we have no alternative to the simplistic model above. Accordingly, achievement of the DCP transmitted ERP should provide prima facie evidence of compliance with the "same coverage" requirement.

It is noted elsewhere in the documentation, that simple further increase of transmitted ERP is unlikely to be an effective way of dealing with coverage/reception problems within the nominal transmitter coverage area. This indicates that broadcasters are likely to need to contemplate additional in-fill transmitters to maintain audience-reach in the post-analog-shut-down period.

Free TV is aware of the substantial development of planning methodologies which have occurred in ITU-R, particularly in the context of the European focussed 2006 Regional Radio Conference and recent work which is continuing to occur in the relevant ITU-R Study Groups and Working Parties.

Free TV and its members remain committed to monitor and participate in tasks which result in future reviews as a result of emerging documentation (including RRC-06 texts, ITU-R texts and revised standards) to see if and where the current Australian DTTB Planning Handbook may also require revision.