Broadcasting Services (Technical Planning) Amendment Guidelines 2009 (No. 1)

Broadcasting Services Act 1992

The AUSTRALIAN COMMUNICATIONS AND MEDIA AUTHORITY makes these Guidelines under section 33 of the Broadcasting Services Act 1992.

Dated 28 April 2009

Chris Chapman
Member

Chris Cheah
Member

1 Name of Guidelines
These Guidelines are the Broadcasting Services (Technical Planning) Amendment Guidelines 2009 (No. 1).

2 Commencement
These Guidelines commence on the day after they are registered.
3 Amendment of Broadcasting Services (Technical Planning) Guidelines 2007


Schedule 1 Amendments
(section 3)

[1] Foreword, second paragraph, including the footnote

Each of the following must comply with these Guidelines:

(a) the licensee of a transmitter licence issued to the holder of:
   (i) a temporary community broadcasting licence issued under Part 6A of the Broadcasting Services Act (see paragraph 108A (1) (d) of the Radiocommunications Act); or
   (ii) a commercial radio broadcasting licence issued under Part 4 of the Broadcasting Services Act (see paragraph 109 (1) (e) of the Radiocommunications Act); or
   (iii) a commercial television broadcasting licence issued under Part 4 of the Broadcasting Services Act (see paragraph 109 (1) (e) of the Radiocommunications Act); or
   (iv) a community television broadcasting licence issued under Part 6 of the Broadcasting Services Act (see paragraph 109 (1) (e) of the Radiocommunications Act); or
   (v) a community radio broadcasting licence issued under Part 6 of the Broadcasting Services Act (see paragraph 109 (1) (e) of the Radiocommunications Act);

(b) the holder of a datacasting transmitter licence issued under Part 3.3 of the Radiocommunications Act (see paragraph 109A (1) (f) of the Radiocommunications Act);

(c) the holder of a digital radio multiplex transmitter licence issued under Part 3.3 of the Radiocommunications Act (see paragraph 109B (1) (n) of the Radiocommunications Act);

(d) any authorised person under those licences.¹

¹ The reference to a licence issued under Part 4 or 6 of the Broadcasting Services Act includes a licence which continues in force pursuant to the provisions of subsection 5 (1) of the Broadcasting Services (Transitional Provisions and Consequential Amendments) Act 1992 as if the licence had been allocated under Part 4 or 6 of the Broadcasting Services Act, ie a commercial or community licence under the Broadcasting Act 1942.
[2] **Foreword, after the ninth paragraph**

*insert*

A licensee of a transmitter licence that is subject to a digital radio channel plan (DRCP), or an authorised person, must not operate, or permit the operation of, a multiplex transmitter otherwise than in accordance with the relevant technical specifications determined by the relevant DRCP (see paragraph 109B (1) (m) of the Radiocommunications Act).

Nothing in the application of these Guidelines should compromise the integrity of the DRCP.

[3] **Guideline 2**

*substitute*

2. These guidelines apply to broadcasting licensees, datacasting licensees and DRMT licensees.

[4] **After guideline 4B**

*insert*

**Digital radio channel plan**

4C. Where these Guidelines relate to digital radio broadcasting services, the Guidelines complement, and are to be read in conjunction with, the technical specifications of any relevant DRCP prepared under section 44A of the Radiocommunications Act.

4D. If the technical specifications in the DRCP are inconsistent with transmitter licence conditions, the technical specifications prevail.

4E. The technical operating specifications of a transmitter must comply with the technical specifications in the relevant DRCP.

[5] **Guideline 6, fifth dot point**

*after* television services

*insert* and digital radio services
[6] After guideline 7A, including the note
insert

7B. For digital radio broadcasting services, ACMA may amend the parts of the Technical Planning Parameters and Methods for Terrestrial Broadcasting and the Digital Terrestrial Television Broadcasting Planning Handbook relevant to the planning of digital radio broadcasting services.

[7] Guideline 8, after definition of broadcasting services bands
insert

BSA licence area has the meaning given by section 5 of the Radiocommunications Act.

[8] Guideline 8, after definition of datacasting transmitter licence
insert

designated BSA radio area has the meaning given by section 5 of the Radiocommunications Act.

insert

digital radio broadcasting service means a commercial, community or national radio broadcasting service transmitted using a digital radio multiplex transmitter.

Digital Radio Channel Plan (DRCP) means a plan made under section 44A of the Radiocommunications Act.

[10] Guideline 8, after definition of digital television service
insert

DRMT licensee means the holder of a digital radio multiplex transmitter licence issued under the Radiocommunications Act.

substitute

Note Services provided by radiocommunications licensees include broadcasting services, national broadcasting services, datacasting services, digital radio broadcasting services and restricted datacasting services.
[12] Guideline 8, after the definition of *FM radio service*

*insert*

*frequency block* means a frequency channel that has a 1.536 MHz bandwidth.

*Note 1* For digital radio, the frequency blocks are identified by the European channel number allocated to the television channel and lettered in the sequence A, B, C, D. For digital television, Australian television channels 6, 7, 8, 9 and 9A correspond to European television channel numbers 5, 6, 7, 8 and 9 respectively. Australian and European television channels have identical numbering for television channels 10, 11 and 12.

*Note 2* Appendix 6 lists digital radio frequency block identifiers and frequencies.

[13] Guideline 8, definition of *licensee*

*substitute*

*licensee* means any of the following:

(a) a broadcasting licensee;
(b) a datacasting licensee;
(c) a DRMT licensee.

[14] Guideline 8, definition of *nominal location*

*omit* LAP or DCP.

*insert* LAP, DCP or DRCP.

[15] Guideline 8, definition of *planned minimum field strength*

*omit* LAP, DCP

*insert* LAP, DCP, DRCP

[16] Guideline 8, definition of *planned minimum field strength*, paragraph (d)

*substitute*

(d) for digital television — the field strength, for the frequency band of operation, specified in table 6.1; and
(e) for digital radio — 63 dBμV/m.
[17] Guideline 8, after definition of planned minimum field strength, including the note

*insert*

*protection ratio* means the ratio between the wanted and unwanted signals, at the receiver input, that must be exceeded to avoid unacceptable interference.

[18] Guideline 8, after definition of residential area

*insert*

*restricted datacasting services* means a datacasting service provided under a restricted datacasting licence issued under Schedule 6 to the Broadcasting Services Act.

[19] Guideline 8, definition of transmitter licence

*substitute*

*transmitter licence* means any of the following licences:

(a) a broadcasting service transmitter licence;
(b) a national broadcasting service transmitter licence;
(c) a narrowcasting service transmitter licence;
(d) a datacasting transmitter licence;
(e) a digital radio multiplex transmitter licence.

[20] Paragraph 8A (d)

*substitute*

(d) in Part 6 — a transmitter authorised to transmit either or both of a digital television service and a datacasting service;
(e) in Part 8 — a transmitter authorised to transmit either or both of digital radio broadcasting services or restricted datacasting services.

[21] Guideline 12

*substitute*

Application of Part 1

12. The following procedure must be followed by a licensee (except a licensee to which Part 7 applies), or an authorised person, if:

(a) the licensee or authorised person is planning to establish a transmitter to transmit:

(i) a broadcasting service; or
(ii) a datacasting service; or
(iii) a digital radio broadcasting service; or
(iv) a restricted datacasting service;

(b) the licensee or authorised person is planning to change the technical operating specifications of a transmitter which is authorised for transmitting:
   (i) a broadcasting service; or
   (ii) a datacasting service; or
   (iii) a digital radio broadcasting service; or
   (iv) a restricted datacasting service.

Note Part 2 of these guidelines should also be followed if a change of transmission site is proposed.

[22] Paragraph 13 (b)

omit

a licensee or an authorised person shall advise:

insert

a licensee, or an authorised person, must advise:

[23] Subparagraphs 13 (b) (ii) and (v)

omit each mention of

other

[24] Subparagraph 13 (b) (vii)

substitute

(vii) narrowcasting (except low power open narrowcasting) licensees that provide services in areas adjacent to the licence area or datacasting service area; and

(viii) DRMT licensees that provide services within the licence area, designated BSA radio area or datacasting service area; and

(ix) DRMT licensees that provide services in areas adjacent to the licence area, designated BSA radio area or datacasting service area;

[25] Paragraph 14 (c)

omit

LAP or DCP

insert

LAP, DCP or DRCP
[26] **Guideline 14, note**

*substitute*

*Note* If a licensee to which Part 7 applies proposes to add an additional transmitter at a site that is not specified in a technical specification in a DCP (or an approved implementation plan), Part 2 will apply in addition to Part 7.

[27] **Paragraph 15 (a), note**

*substitute*

*Note* For services described in a LAP, DCP or DRCP, calculations must be performed assuming maximum ERP specifications as set out in the LAP, DCP or DRCP (whichever is applicable).

[28] **Subparagraph 15 (c) (i)**

*substitute*

(i) the EMC calculations indicate that operation from the alternate site will not cause interference to existing services provided by radiocommunications licensees, including:

(A) broadcasting services; and
(B) national broadcasting services; and
(C) narrowcasting (except low power open narrowcasting) services; and
(D) datacasting services; and
(E) digital radio broadcasting services; and
(F) restricted datacasting services; and
(G) any service described in a LAP, DCP or DRCP; and

[29] **Subparagraph 15 (f) (i)**

*substitute*

(i) the results of the tests demonstrate that operation from the alternative site will not cause interference to existing services provided by radiocommunications licensees, including:

(A) broadcasting services; and
(B) national broadcasting services; and
(C) narrowcasting (except low power open narrowcasting) services; and
(D) datacasting services; and
(E) digital radio broadcasting services; and
(F) restricted datacasting services; and
(G) any service described in a LAP, DCP or DRCP; and
[30] After guideline 102

102A. A licensee of a digital television broadcasting service or datacasting service must not cause unacceptable interference to a digital radio broadcasting service, or restricted datacasting service, that is:

(a) operating within the terms of the relevant DRCP; and
(b) being received within its designated BSA radio area; and
(c) being received at a location where the median field strength is equal to, or greater than, the planned minimum field strength; and
(d) being received with an antenna that provides neither directivity nor polarisation discrimination.

102B. For guideline 102A, unacceptable interference has the meaning set out in the following table for particular kinds of interference.

<table>
<thead>
<tr>
<th>Item</th>
<th>If the interference is unsatisfactory</th>
<th>Unacceptable interference occurs if</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>co-channel interference</td>
<td>(a) degradation in the carrier-to-noise-plus-interference ratio of a digital radio receiving system is 1 dB or more due to the unwanted service; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b) the resulting co-channel carrier-to-noise-plus-interference ratio is less than 9 dB</td>
</tr>
<tr>
<td>2</td>
<td>adjacent channel interference</td>
<td>(a) the digital television broadcasting service or datacasting service occupies a television channel; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b) the television channel is adjacent to a television channel, within which is the frequency block of the digital radio broadcasting or restricted datacasting service; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(c) the resulting ratio of wanted to unwanted signals is less than −42 dB</td>
</tr>
</tbody>
</table>

102C. For item 2 of the table in guideline 102B, an allowance of 5 dB must be added to the resulting ratio of wanted to unwanted signals to take account of variable factors affecting the relative levels of the received adjacent channel transmissions, including:

(a) multipath effects; and
(b) frequency dependent differences in receiving and transmitting antenna patterns; and
(c) antenna gain across the channels.

Note For situations where the wanted and unwanted signals emanate from different antennas, see the note to guideline 94.
102D. If the same digital radio broadcasting services, or restricted datacasting services, can be received from more than 1 transmission site, with signal levels above the planned minimum field strength, application of guidelines 102A to 102C must ensure that the reception of at least 1 of the signals is protected against interference from the unwanted service.

[31] Guideline 104

substitute

104. In addition to guidelines 90 to 103, a licensee must, in consultation with affected parties, resolve complaints of interference to other services provided by radiocommunications licensees if that interference is caused by operation of the transmitter pursuant to the licensee’s digital television broadcasting service or datacasting service.

Note Guidelines 90 to 103 relate to analog television services, digital television services, datacasting services, digital radio broadcasting services and restricted datacasting services.

[32] After Part 7

insert

PART 8: DIGITAL RADIO

Division 1 Application of Part 8

177. This Part of the guidelines applies to a DRMT licensee, or an authorised person, who intends to implement or change the technical operating specification of a transmitter operating under a digital radio multiplex transmitter licence that is occupying a frequency block in the frequency band 174 to 230 MHz.

Division 2 Location of transmitter site

178. The transmitter site must be located within the designated BSA radio area, unless a different site is specified in the technical specifications of the DRCP or an approved implementation plan.

Division 3 Effective radiated power

179. If a transmitter intended to serve a particular area is not sited at the nominal location, the ERP of the transmission in any given direction from the alternative site must not exceed that specified for the nominal location in the DRCP.

Note 1 Division 3 does not preclude a licensee from making an application to vary a DRCP if operation at higher ERP levels is required.
Note 2 Guideline 207 deals with the situation where a licensee proposes to operate transmitters additional to those included in a DRCP.

Division 4 Minimum level of service requirements

180. Unless otherwise specified in the DRCP, or in the transmitter licence conditions for the DRMT licensee, a DRMT licensee must ensure that:

(a) minimum level of service requirements are complied with for the designated BSA radio area; and

(b) either:

(i) if a transmitter is sited at the nominal location and an omnidirectional pattern is specified for the transmitter in the DRCP, the ERP of the transmission is no more than 5 dB below the maximum ERP specified in the DRCP; or

(ii) if a transmitter is sited at the nominal location and a directional radiation pattern is specified for the transmitter in the DRCP, the ERP of the transmission is no more than 5 dB below the maximum ERP specified in the DRCP, over at least 60 per cent of each defined arc; and

(c) the ERP of the transmission, which is in the direction of any urban centre within the designated BSA radio area, is no more than 5 dB below the maximum ERP specified in the DRCP.

Note ACMA, in considering whether to exercise its discretion in relation to the minimum power of a service, must have regard to the fact that operation at power levels below that planned for the service may result in interference to the service. ACMA’s planning framework will not generally protect services from interference in these circumstances.

181. If a transmitter is not sited at the nominal location, the DRMT licensee must provide at least the minimum level of service to those urban centres in the designated BSA radio area that would have been received from a transmitter operating from the nominal location at the minimum ERP requirements specified in guideline 180.

182. For guideline 181, the minimum level of service requirement in an urban centre is achieved if the received median field strength available at the receiver’s location is equal to, or more than, 70 dBµV/m.

Division 5 Maximum field strength within designated BSA radio area

183. A transmitter must be sited so that not more than 1 per cent of the total population receiving at least the planned minimum field strength resides in areas with field strengths greater than 110 dBµV/m.

184. A transmitter must not be sited so that a significant part of the population receiving at least the planned minimum field strength resides in areas with field strengths greater than 120 dBµV/m (1 V/m).

significant part means the lesser of:

(a) 0.1 per cent of the population receiving at least the planned minimum field strength; and
(b) 100 persons.

Note 1 Division 5 deals with potential interference and degradation in receiver performance due to excessive signal levels.

Note 2 The height of the antenna above ground level and the vertical radiation pattern may be altered to assist in complying with Division 5.

Division 6 Maximum field strength beyond designated BSA radio area boundary

185. If the transmitter is not sited at the nominal location, the DRMT licensee must ensure that the median field strength of the transmission in any urban centre beyond the designated BSA radio area boundary does not exceed the greater of:

(a) the level that would occur if the transmitter was operating from the nominal location; and

(b) 70 dBµV/m.

186. If there is no technical specification specified in a DRCP for a transmitter, the median field strength of the transmission in any urban centre beyond the designated BSA radio area boundary must not exceed a field strength of 70 dBµV/m unless another maximum field strength is specified in the transmitter licence conditions.

Division 7 Interference to other services

Subdivision 1 Interference to analog television

187. A DRMT licensee must not cause unacceptable interference to an analog television service:

(a) operating within the terms of:

(i) if a LAP applies to the analog television service — the LAP; or

(ii) if transmitter licence conditions apply to the analog television service — the transmitter licence conditions; and

(b) being received within its licence area, national signal reception area or narrowcasting service area (whichever is applicable); and

(c) being received with median field strengths equal to, or greater than, the planned minimum field strength.

188. For guideline 187, it is assumed that:

(a) analog television services are being received using a television receiving system that has equivalent performance to the analog reference television receiving system; and

(b) interference protection will only be afforded to the level provided by the analogue reference television system whether or not:

(i) receiving systems are used that have inferior performance to that of the analog reference television receiving system; or
(ii) the performance of the receiving system exceeds the performance of the analog reference television system in ways that make the receiving system more susceptible to interference.

189. For guideline 187, unacceptable interference has the meaning set out in the following table for particular kinds of interference.

<table>
<thead>
<tr>
<th>Item</th>
<th>If the interference is ...</th>
<th>Unacceptable interference occurs if ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>co-channel interference</td>
<td>(a) degradation in the ratio of the wanted to unwanted signals, at the receiver input terminals of an analog reference television receiving system, is 2 dB or more due to the unwanted service; and (b) the resulting ratio of wanted to unwanted signals at the receiver input terminals of an analog reference television receiving system is less than the relevant value specified in the table in guideline 190 for: (i) the digital radio frequency block combination; and (ii) analog television channel</td>
</tr>
<tr>
<td>2</td>
<td>adjacent channel interference</td>
<td>(a) the digital radio multiplex transmitter occupies a frequency block within a television channel that is adjacent to an analog television service; and (b) the resulting ratio of wanted to unwanted signals at the receiver input terminals of an analog reference television receiving system is less than the relevant value specified in the table in guideline 190 for: (i) the digital radio frequency block combination; and (ii) analog television channel</td>
</tr>
</tbody>
</table>
190. The following table specifies the required protection ratios to avoid interference from digital radio.

<table>
<thead>
<tr>
<th>Unwanted transmitter</th>
<th>Wanted Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Digital Radio (DAB) Frequency Block(s) of potentially interfering service within the relevant TV channel</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>A</td>
<td>38</td>
</tr>
<tr>
<td>B</td>
<td>40</td>
</tr>
<tr>
<td>C</td>
<td>34</td>
</tr>
<tr>
<td>D</td>
<td>39</td>
</tr>
<tr>
<td>A B</td>
<td>42</td>
</tr>
<tr>
<td>A C</td>
<td>39</td>
</tr>
<tr>
<td>A D</td>
<td>42</td>
</tr>
<tr>
<td>B C</td>
<td>41</td>
</tr>
<tr>
<td>B D</td>
<td>43</td>
</tr>
<tr>
<td>C D</td>
<td>40</td>
</tr>
<tr>
<td>A B C</td>
<td>43</td>
</tr>
<tr>
<td>B C D</td>
<td>43</td>
</tr>
<tr>
<td>A C D</td>
<td>42</td>
</tr>
<tr>
<td>A B D</td>
<td>44</td>
</tr>
<tr>
<td>A B C D</td>
<td>44</td>
</tr>
</tbody>
</table>

* For digital radio in regional licence areas a protection ratio value of 22 dB may be used for this combination of frequency blocks operating co-channel with a digital television service.

**Note 1** Guideline 204 deals with the selection of the appropriate row in the above table.

**Note 2** Digital radio (DAB) frequency blocks are identified by a number followed by a letter A, B, C or D, eg 9B and 12D.

**Note 3** For the table, N is the numeric part of the frequency block identifier. For TV channel 6, N = 5; For TV channel 7, N = 6; For TV channel 8, N = 7; For TV channel 9, N = 8; For TV channel 9A, N = 9; For TV channel 10, N = 10; For TV channel 11, N = 11;
For TV channel 12, $N = 12$;
See also the definition of frequency block in guideline 8 and the list of digital radio (DAB) frequency blocks in Appendix 6.

191. For item 2 of the table in guideline 189, an allowance of 5 dB must be added to the relevant value specified in the table in guideline 190 to account for variable factors affecting the relative levels of the received adjacent channel transmissions, including:

(a) multipath effects; and
(b) frequency dependent differences in receiving and transmitting antenna patterns; and
(c) antenna gain across the channels.

Note 1 If a wanted and an unwanted signal emanate from the same antenna, the adjacent channel protection ratio can be calculated as the power ratio of the two signals applied to the antenna. However, if the wanted and unwanted signal emanate from different antennas, a more complex calculation is needed. It is necessary to calculate the wanted and unwanted field strength levels for all locations where the wanted service can be received with a median field strength higher than the planned minimum field strength. In this event, the field strength predictions will need to take account of the following factors:

(a) ERP of both services;
(b) location and site height of both sites;
(c) effective antenna height of both antennas;
(d) horizontal and vertical radiation patterns of the antennas at both sites;
(e) polarisation of both transmissions;
(f) a terrain model that covers the area of interest.

Note 2 For paragraph (f) of Note 1 the terrain model should include information, if available, about the clutter layer above the basic terrain and an appropriate propagation model.

192. If the same set of analog television services can be received from more than 1 transmission site with signal levels above the planned minimum field strength, application of guidelines 187 to 191 must ensure that:

(a) the reception of at least 1 of the sets of services, but not necessarily all of the sets of the same services, is protected against interference from the unwanted service; and
(b) if multiple transmissions of the same analog television service can be received from a single transmission site with signal levels above the planned minimum field strength — the reception of at least a UHF transmission is protected against interference from the unwanted service.

Subdivision 2 Interference to digital television or datacasting

193. A DRMT licensee must not cause unacceptable interference to a digital television service or datacasting service that is:

(a) operating within the terms of:

(i) if a DCP applies to the digital television service or datacasting service — the DCP; or
(ii) if an approved implementation plan applies to the digital television service or datacasting service — the approved implementation plan; and

(b) being received within its licence area, national signal reception area or datacasting service area (whichever is applicable); and

(c) being received with median field strengths equal to, or greater than, the planned minimum field strength.

194. For guideline 193, it is assumed that:

(a) digital television services or datacasting services are being received using a television receiving system that has equivalent performance to the digital reference television receiving system; and

(b) interference protection will only be afforded to the level provided by the digital television receiving system whether or not:

(i) receiving systems are used that have inferior performance to that of the digital reference television receiving system; or

(ii) the performance of the receiving system exceeds the performance of the digital reference television receiving system in ways that make the receiving system more susceptible to interference.

195. For guideline 193, **unacceptable interference** has the meaning set out in the following table for particular kinds of interference.

<table>
<thead>
<tr>
<th>Item</th>
<th>If the interference is ...</th>
<th>unacceptable interference occurs if ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 co-channel</td>
<td>(a) degradation in the</td>
<td>(a) degradation in the carrier-to-noise-plus-interference ratio at the receiver input terminals of a digital reference television receiving system is 1 dB or more due to the unwanted service; and</td>
</tr>
<tr>
<td>interference</td>
<td>carrier-to-noise-plus-interference ratio at the receiver input terminals of a digital reference television receiving system is 1 dB or more due to the unwanted service; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) the resulting co-channel wanted to unwanted ratio is less than the relevant value specified in the table in guideline 190 for:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(i) the digital radio frequency block; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ii) digital television or datacasting channel</td>
<td></td>
</tr>
<tr>
<td>2 adjacent</td>
<td>(a) the digital television broadcasting service or datacasting service occupies a channel that is adjacent to a digital television or datacasting service; and</td>
<td></td>
</tr>
<tr>
<td>channel</td>
<td>(a) the digital television broadcasting service or datacasting service occupies a channel that is adjacent to a digital television or datacasting service; and</td>
<td></td>
</tr>
<tr>
<td>interference</td>
<td>(b) the resulting wanted to unwanted ratio at the receiver input terminals of a digital reference television receiving system is less than the relevant value specified in the table in guideline 190 for:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(i) the digital radio frequency block; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(ii) digital television or datacasting channel</td>
<td></td>
</tr>
</tbody>
</table>
196. For item 2 of the table in guideline 195, an allowance of 5 dB must be added to the relevant value specified in the table in guideline 190 to account for variable factors affecting the relative levels of the received adjacent channel transmissions, including:

(a) multipath effects; and

(b) frequency dependent differences in receive and transmit antenna patterns; and

(c) antenna gain across the channels.

Note For situations where the wanted and unwanted signals emanate from different antennas, see the notes to guideline 191.

197. If the same digital television service or datacasting service can be received from more than 1 transmission site with signal levels above the planned minimum field strength, application of guidelines 193 to 196 must ensure that the reception of at least 1 of the signals is protected against interference from the unwanted service.

Subdivision 3 Interference to other digital radio or restricted datacasting services

198. A DRMT licensee must not cause unacceptable interference to a digital radio broadcasting service or restricted datacasting service that is:

(a) operating within the terms of the DRCP that applies to the DRMT licensee; and

(b) being received within its designated BSA radio area; and

(c) being received with median field strengths equal to, or greater than, the planned minimum field strength.

199. For guideline 198, unacceptable interference has the meaning set out in the following table for particular kinds of interference.

<table>
<thead>
<tr>
<th>Item</th>
<th>If the interference is …</th>
<th>unacceptable interference occurs if …</th>
</tr>
</thead>
</table>
| 1    | co-channel interference  | (a) degradation in the carrier-to-noise-plus-interference ratio of a digital radio receiving system is 1 dB or more due to the unwanted service; and  
(b) the resulting co-channel wanted to unwanted ratio is less than the relevant value specified in the table in guideline 190 for the applicable digital radio frequency block |
| 2    | adjacent channel interference | (a) the digital radio broadcasting service or restricted datacasting service occupies a digital radio frequency block that is adjacent to a digital radio broadcasting or restricted datacasting service; and  
(b) the resulting wanted to unwanted ratio of a digital radio receiving system is less than the relevant value specified in the table in guideline 190 for the applicable digital radio frequency block |
200. For item 2 of the table in guideline 199, an allowance of 5 dB must be added to the relevant value specified in the table in guideline 190 to account for variable factors affecting the relative levels of the received adjacent channel transmissions, including:

(a) multipath effects; and

(b) frequency dependent differences in receive and transmit antenna patterns; and

(c) antenna gain across the channels.

Note For situations where the wanted and unwanted signals emanate from different antennas, see the notes to guideline 191.

201. If the same digital radio broadcasting services or restricted datacasting services can be received from more than 1 transmission site with signal levels above the planned minimum field strength, application of guidelines 198 to 200 must ensure that the reception of at least 1 of the signals is protected against interference from the unwanted service.

202. If a digital radio broadcasting service or restricted datacasting service:

(a) does not provide a service from a transmission site included in a DRCP technical specification; or

(b) operates at an alternative site from that specified in the DRCP technical specification; or

(c) operates from an additional site not included in a DRCP technical specification (see guideline 207);

then, the service will be afforded protection against interference from other digital television services or datacasting services included in the DRCP based on the assumption that it is operating from the nominal location or nominal locations included in the DRCP.

Subdivision 4 Complaints about interference

203. In addition to the conditions in Divisions 5 and 6 and Subdivisions 1, 2 and 3 of Division 7, a licensee must, in consultation with affected parties, resolve complaints of interference to other services provided by radiocommunications licensees if that interference is caused by operation of the digital radio multiplex transmitter.

Subdivision 5 Protection ratio value

204. For the application of guidelines 189, 195 and 199, the row in the table in guideline 190 that corresponds to the combination of digital radio (DAB) frequency blocks planned in the DRCP is to be used to determine the appropriate protection ratio value for use within the designated BSA radio area that falls within the relevant television channel.
Division 8  Single frequency networks and additional co-channel transmitters

Note 1 ACMA’s planning responsibility is limited to determining frequency blocks, nominal transmitter sites and radiation pattern envelope specifications. Licensees are responsible for the detailed design and implementation of Single Frequency Networks (SFNs), including:
(a) determination of relative ERP levels; and
(b) timing relationships between signals from each of the transmitters within an SFN.

Note 2 Through its DRCPs ACMA has defined a set of frequency blocks, transmission sites and radiation pattern envelope specifications that will permit digital radio broadcasting and restricted datacasting services to be provided. Where a DRMT licensee proposes to deploy additional transmitters on the same frequency block as an existing allotment within a DRCP (ie transmitters in addition to those shown in the technical specifications associated with the DRCP), it is the licensee’s responsibility:
(a) to ensure that Part 8 is complied with; and
(b) to design and site the additional transmitters to avoid co-channel interference, or adjacent channel interference, from other services within the intended coverage area of the additional transmitters.

205. A DRMT licensee may configure co-channel transmitters, whose technical specifications are included in a DRCP, into an SFN.

206. However, the licensee is responsible for the detailed implementation and management of internal self-interference within the SFN.

207. A DRMT licensee may be permitted to establish additional transmitters on the same channel as an existing channel allotment within a DRCP assignment for that service (which may, or may not, be operated in an SFN arrangement), without requiring a variation to the DRCP, subject to the following conditions:
(a) the area to be covered is not adequately served by transmitters operating in accordance with the DRCP technical specifications; and

Note 1 Guidelines 180 to 182 define the maximum level of service requirements for digital radio broadcasting services.

Note 2 For paragraph 207 (a), an area may also be considered under served if an existing co-channel allotment determined in a DRCP does not allow sufficient coverage due to self-interference.

(b) transmitter licence applications relating to the additional transmitters are submitted to ACMA; and

(c) the licensee is responsible for managing self-interference arising from the additional co-channel transmitters, and for resolving co-channel or adjacent channel interference from other services within the intended coverage area of the additional transmitters; and

(d) the characteristics of the additional transmitters comply with:
   (i) Part 1; and
   (ii) Divisions 2, 5, 6 and 7; and
   (iii) guideline 208; and
(e) in addition to the interference conditions set out in guidelines 187, 188, item 1 of the table in guideline 189 and guidelines 190 and 192 for co-channel interference to analog television services, the interfering field strength from the proposed additional transmission is at least 6 dB below the root-sum-squared value of the existing co-channel interferers; and

(f) in addition to the interference conditions set out in guidelines 193, 194, item 1 of the table in guideline 195 and guideline 197 for co-channel interference to digital television services or datacasting services, the interfering field strength from the proposed additional transmission is at least 10 dB below the root-sum-squared value of the existing co-channel interferers; and

(g) in addition to the interference conditions set out in guideline 198, item 1 of the table in guideline 199 and guideline 201 for co-channel interference to digital radio broadcasting services or restricted datacasting services, the interfering field strength from the proposed additional transmission is at least 10 dB below the root-sum-squared value of the existing co-channel interferers.

**Division 9 Radiated signal characteristics**

208. Unless otherwise stated in the DRCP, or conditions specified in the digital radio multiplex transmitter licence, the radiated signal characteristics of the transmitter must comply with the spectrum mask for VHF transmitters in certain other circumstances (i.e. non-critical areas) for adjacent channel interference as specified in clause 15.4 of standard ETSI EN 300 401 V1.4.1, issued by the European Telecommunications Standards Institute (ETSI) and available from the ETSI website (www.etsi.org).

209. If a DRMT licensee operates its transmitter with modulation parameters other than the reference modulation parameters, the service operated by the DRMT licensee will not be afforded greater protection from interference than would be afforded to the service if the transmitter had operated with the reference modulation parameters.

210. For guideline 209, reference modulation parameters means the use of Transmission Mode 1 and a Protection Level of 3, as described in the standard ETSI EN 300 401 V1.4.1, issued by the ETSI.

*Note 1* Transmission Modes and Protection Levels for digital radio multiplex transmitters are described in and available from the ETSI website (www.etsi.org).

*Note 2* Licensees may also wish to refer to Australian Standard AS 4943.1—2009, *Digital radio — Terrestrial broadcasting — Characteristics of terrestrial digital audio broadcasting (T-DAB+) transmissions.*
[33] After Appendix 5

insert

Appendix 6: Digital radio (DAB) frequency blocks

Table A6.1: Frequency blocks for digital radio services (174-230MHz)

<table>
<thead>
<tr>
<th>Digital Radio (DAB) Frequency Block Identifier</th>
<th>Australian television channel number</th>
<th>Centre frequency (MHz)</th>
<th>Frequency range (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5A</td>
<td>6</td>
<td>174.928</td>
<td>174.160-175.696</td>
</tr>
<tr>
<td>5B</td>
<td>6</td>
<td>176.640</td>
<td>175.872-177.408</td>
</tr>
<tr>
<td>5C</td>
<td>6</td>
<td>178.352</td>
<td>177.584-179.120</td>
</tr>
<tr>
<td>5D</td>
<td>6</td>
<td>180.064</td>
<td>179.296-180.832</td>
</tr>
<tr>
<td>6A</td>
<td>7</td>
<td>181.936</td>
<td>181.168-182.704</td>
</tr>
<tr>
<td>6B</td>
<td>7</td>
<td>183.648</td>
<td>182.880-184.416</td>
</tr>
<tr>
<td>6C</td>
<td>7</td>
<td>185.360</td>
<td>184.592-186.128</td>
</tr>
<tr>
<td>6D</td>
<td>7</td>
<td>187.072</td>
<td>186.304-187.840</td>
</tr>
<tr>
<td>7A</td>
<td>8</td>
<td>188.928</td>
<td>188.160-189.696</td>
</tr>
<tr>
<td>7B</td>
<td>8</td>
<td>190.640</td>
<td>189.872-191.408</td>
</tr>
<tr>
<td>7C</td>
<td>8</td>
<td>192.352</td>
<td>191.584-193.120</td>
</tr>
<tr>
<td>7D</td>
<td>8</td>
<td>194.064</td>
<td>193.296-194.832</td>
</tr>
<tr>
<td>8A</td>
<td>9</td>
<td>195.936</td>
<td>195.168-196.704</td>
</tr>
<tr>
<td>8B</td>
<td>9</td>
<td>197.648</td>
<td>196.880-198.416</td>
</tr>
<tr>
<td>8C</td>
<td>9</td>
<td>199.360</td>
<td>198.592-200.128</td>
</tr>
<tr>
<td>8D</td>
<td>9</td>
<td>201.072</td>
<td>200.304-201.840</td>
</tr>
<tr>
<td>9B</td>
<td>9A</td>
<td>204.640</td>
<td>203.872-205.408</td>
</tr>
<tr>
<td>9C</td>
<td>9A</td>
<td>206.352</td>
<td>205.584-207.120</td>
</tr>
<tr>
<td>9D</td>
<td>9A</td>
<td>208.064</td>
<td>207.296-208.832</td>
</tr>
<tr>
<td>10A</td>
<td>10</td>
<td>209.936</td>
<td>209.168-210.704</td>
</tr>
<tr>
<td>10B</td>
<td>10</td>
<td>211.648</td>
<td>210.880-212.416</td>
</tr>
<tr>
<td>10C</td>
<td>10</td>
<td>213.360</td>
<td>212.592-214.128</td>
</tr>
<tr>
<td>10D</td>
<td>10</td>
<td>215.072</td>
<td>214.304-215.840</td>
</tr>
<tr>
<td>Digital Radio (DAB) Frequency Block Identifier</td>
<td>Australian television channel number</td>
<td>Centre frequency (MHz)</td>
<td>Frequency range (MHz)</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------------------------------------</td>
<td>------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>11A</td>
<td>11</td>
<td>216.928</td>
<td>216.160-217.696</td>
</tr>
<tr>
<td>11B</td>
<td>11</td>
<td>218.640</td>
<td>217.872-219.408</td>
</tr>
<tr>
<td>11C</td>
<td>11</td>
<td>220.352</td>
<td>219.584-221.120</td>
</tr>
<tr>
<td>11D</td>
<td>11</td>
<td>222.064</td>
<td>221.296-222.832</td>
</tr>
<tr>
<td>12A</td>
<td>12</td>
<td>223.936</td>
<td>223.168-224.704</td>
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<tr>
<td>12B</td>
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<td>225.648</td>
<td>224.880-226.416</td>
</tr>
<tr>
<td>12C</td>
<td>12</td>
<td>227.360</td>
<td>226.592-228.128</td>
</tr>
<tr>
<td>12D</td>
<td>12</td>
<td>229.072</td>
<td>228.304-229.840</td>
</tr>
</tbody>
</table>

Note 1: This table is for information only. For more detail, refer to ETSI TR 101 496-3 V1.1.2 (2001-05) Digital Audio Broadcasting (DAB); Guidelines and rules for implementation and operation; Part 3: Broadcast network.

Note 2: This table excludes DAB frequency blocks 10N, 11N and 12N as these are not applicable to Australia.

[34] Explanatory notes, heading Introduction, second paragraph

omit

paragraphs 108A (1) (d), 109 (1) (e) and 109A (1) (f)

insert

paragraphs 108A (1) (d), 109 (1) (e), 109A (1) (f) and 109B (1) (n)

[35] Explanatory notes, heading Introduction, second paragraph

omit

datacasting transmitter licence

insert

datacasting transmitter licence or a digital radio multiplex transmitter licence

[36] Explanatory notes, heading Overview of planning under the Broadcasting Services Act, subheading Technical specifications and licence area plans (LAPs), first paragraph

omit

In licence area planning,

insert

In developing licence area plans (LAPs) and digital radio channel plans (DRCPs),
[37] Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Technical specifications and licence area plans (LAPs)*, second paragraph

*omit*
the LAP,

*insert*
the LAP or DRCP,

[38] Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Technical specifications and licence area plans (LAPs)*, third paragraph

*omit*
The LAP

*insert*
The LAP or DRCP

[39] Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Technical specifications and licence area plans (LAPs)*, after the third paragraph

*insert*
The technical specifications for digital television services specified in Digital Channel Plans (DCPs) are broadly based on the analog television specifications from the relevant LAP.
[40] Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*

omit the subheading

Variations to technical specifications in LAPS or digital channel plans (DCPs)

insert

Variations to technical specifications

[41] Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Variations to technical specifications in LAPS or digital channel plans (DCPs)*, first paragraph

substitute

ACMA cannot make substantive changes to existing specifications in a LAP, DCP or DRCP except by way of production of a new LAP, DCP or DRCP, or formal variation of the existing LAP, DCP or DRCP. In many cases, the change is more likely to be initiated by a licensee seeking a variation to the transmitter licence (such as a frequency change or power increase).

[42] Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Variations to technical specifications in LAPS or digital channel plans (DCPs)*, after the third paragraph

insert

Production of, or a variation to, a DRCP requires public consultation in accordance with subsection 44A (7) of the Radiocommunications Act.

[43] Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Variations to technical specifications in LAPS or digital channel plans (DCPs)*, fourth paragraph

omit each mention of

LAP or DCP

insert

LAP, DCP or DRCP
Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Transmitter operation away from the nominal location*, first paragraph

*omit*

the LAP or DCP.

*insert*

the LAP, DCP or DRCP.

Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Transmitter operation away from the nominal location*, second paragraph

*omit*

the LAP or DCP.

*insert*

the LAP, DCP or DRCP.

Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Transmitter operation away from the nominal location*, second paragraph

*omit*

the LAP or DCP,

*insert*

the LAP, DCP or DRCP,

Explanatory notes, heading *Overview of planning under the Broadcasting Services Act*, subheading *Planning and development approvals from other Authorities*, first paragraph

*omit*

the LAP or DCP

*insert*

the LAP, DCP or DRCP
[48] Explanatory notes, heading *Outline of the Technical Planning Guidelines*, first paragraph

*omit*

analog television or digital television,

*insert*

analog television, digital television or digital radio,


*substitute*

The introduction outlines the relevance of the TPGs to the LAP, DCP or DRCP. The introduction also details the broadcasting services bands and gives the definition for terms used in the TPGs. The TPGs are to be read in conjunction with the technical specifications of the relevant LAP, DCP or DRCP.


*omit*

the LAP or DCP or transmitter licence,

*insert*

the LAP, DCP, DRCP or transmitter licence,


*omit*

broadcasting service or datacasting service

*insert*

broadcasting service, datacasting service or digital radio multiplex
Explanatory notes, heading Outline of the Technical Planning Guidelines, subheading Part 1: Start-up procedure, third paragraph

Substitute

AM and FM radio, analog television, datacasting transmitter and digital radio multiplex transmitter licensees are required:

(a) to advertise in the newspapers circulating in the licence area, the designated BSA radio area or datacasting service area of the approved service at least 7 days before commencing test transmissions; and

(b) to advise ACMA of the date and time of commencement of the test transmissions, the duration of the test transmissions and proposed technical operating specifications of the test transmissions; and

(c) to advise broadcasters that are within and adjacent:

(i) to the licence area; or

(ii) to the datacasting service area;

of the date and time of commencement of the test transmissions, the duration of the test transmissions and proposed technical operating specifications of the test transmissions; and

(d) if practicable — to make regular announcements during the test transmissions identifying the licensee and providing sufficient information for members of the public to contact the licensee if the broadcast causes interference.

Explanatory notes, heading Outline of the Technical Planning Guidelines, subheading Part 1: Start-up procedure, fourth paragraph

Omit analog services,

Insert analog television services,

Explanatory notes, heading Outline of the Technical Planning Guidelines, subheading Part 2: Change of transmitter site procedure, first paragraph

Omit the LAP or DCP,

Insert the LAP, DCP or DRCP,
Explanatory notes, heading Outline of the Technical Planning Guidelines, subheading Part 6: Digital television, first paragraph

omit
Annex B.

insert
Annex A.

Explanatory notes, heading Outline of the Technical Planning Guidelines, after Part 7

insert

Part 8: Digital radio
The guidelines related to digital radio and restricted datacasting services follow a generally similar approach to those of digital television. However, in some instances, the digital radio provisions reflect provisions contained in Part 4: FM radio.

Explanatory notes, heading Emission standards for broadcasting transmitters, first paragraph

omit
to broadcasting transmitters

insert
to analog broadcasting transmitters

Explanatory notes, heading Emission standards for broadcasting transmitters, first paragraph

omit
for radio

insert
for AM and FM radio
The basic planning principles for digital radio are similar to those used in planning for FM radio and television broadcasting services. Parameters specific to digital radio are drawn from widely recognised international sources including the ITU and the European Broadcasting Union (EBU) as well as ACMA and Australian industry measurements. ACMA may publish material relating to digital radio planning in the future. Any digital radio planning material published by ACMA will be made available on the ACMA website.

The TPGs include the emission standards for AM, FM and television broadcasting transmitters, and are applied to commercial, community (including temporary community) broadcasting licensees and datacasting licensees through the powers contained in the Broadcasting Services Act.

television services.

 television services and digital radio.
[62] Annex A
omit

[63] Annex B, heading
substitute

Annex A: Explanatory notes related to digital television

[64] Annex B, heading Adjacent channel and SFN operation, sixth paragraph
omit
   LAP or DCP sites,
insert
   LAP, DCP or DRCP sites,

Note
1. All legislative instruments and compilations are registered on the Federal Register of Legislative Instruments kept under the Legislative Instruments Act 2003. See http://www.frli.gov.au