

EXPLANATORY STATEMENT

Issued by the Australian Communications and Media Authority

Radiocommunications Advisory Guidelines (Managing Interference to Receivers – 700 MHz Band) 2012

Radiocommunications Act 1992

Purpose

The purpose of the *Radiocommunications Advisory Guidelines (Managing Interference to Receivers – 700 MHz Band) 2012* (the **Advisory Guidelines**) is to provide recommendations on the management and settlement of interference to radiocommunications receivers operating under spectrum licences in the 700 MHz band and caused by radiocommunications transmitters operating under other licences.

Legislative Provisions

Under section 262 of the *Radiocommunications Act 1992* (the **Act**), the Australian Communications and Media Authority (the **ACMA**) may make written advisory guidelines about any aspect of radiocommunication or radio emissions.

Subsection 262(2) of the Act gives the following as examples of matters on which advisory guidelines may be made:

- > any matter in respect of which standards may be made under Part 4.1 of the Act; or
- > the use, construction, design or performance of any thing; or
- > interference with radiocommunications; or
- > frequency allocation and coordination.

The examples provided in the Act are not exhaustive. The ACMA may make written advisory guidelines about any aspect of radiocommunication or radio emissions.

Background

The Government has announced that analog television transmission will be progressively turned off from 2010, with a complete switchover to digital television transmission by December 2013. The transition from analog to digital television will make spectrum available in the UHF band for new services.

In January 2010, the Department of Broadband, Communications and the Digital Economy (the **DBCDE**) released the *Digital Dividend Green Paper*. The paper provided information on the digital dividend and sought public comment on a range of issues, including potential uses of the digital

dividend spectrum¹. The majority of submissions to the DBCDE's Digital Dividend Green Paper suggested that the characteristics of digital dividend spectrum were highly attractive for use in the deployment of mobile telecommunications services, particularly Long Term Evolution (**LTE**) networks.

Similar changes in spectrum use are occurring internationally as a result of the adoption of digital television systems. The spectrum which will become available does not align internationally from region to region, mainly due to historical differences in the frequency bands used for television and other radiocommunications services.

The increasing demand for spectrum for mobile broadband telecommunications services around the world has seen a significant proportion of the world-wide digital dividend spectrum being allocated to support wireless access services (**WAS**)—in particular, next generation systems such as LTE. This demand has been for spectrum to support broad bandwidth, two-frequency systems, particularly in high density areas.

By aligning with a major established international set of arrangements in the band, Australia will be able to take advantage of economies of scale—providing lower costs for both service providers and end users—as well as easier and wider roaming capabilities for users.

Following consideration of several established international band arrangements, including those from the USA and Europe, the ACMA intends for Australia to follow the plan developed by the Asia-Pacific Telecommunity (**APT**) Wireless Group (**AWG**). However, due to the difference in the exact frequency boundaries between Australia's Digital Dividend and the AWG plan, the lower guard band (between proposed WAS and broadcast television services) in Australia will be 9 MHz wide, as opposed to 5 MHz in many other Asia-Pacific nations.

Spectrum licence technical frameworks define a spectrum licensee's rights and obligations, and provide an interference management framework. To allow for use of the 700 MHz band which is aligned to the plan developed by AWG, the ACMA wishes to put into place a spectrum licence technical framework for the 700 MHz band that permits deployment of mobile telecommunications services but is, as far as practical, technology flexible.

The Advisory Guidelines are part of a set of legislative instruments which will give effect to this spectrum licence technical framework. The set of instruments required for this purpose are listed below:

- > *Radiocommunications (Spectrum Re-allocation) Declaration No. 1 of 2011*
- > *Radiocommunications Spectrum Marketing Plan (700 MHz Band) 2012;*
- > *Radiocommunications (Unacceptable Levels of Interference — 700 MHz Band) Determination 2012;*
- > *Radiocommunications Advisory Guidelines (Managing Interference from Transmitters – 700 MHz Band) 2012;* and

¹ A copy of this paper can be found on www.dbcde.gov.au

- > these Advisory Guidelines.

Operation

A spectrum licence permits a licensee, subject to specified conditions, to operate radiocommunications devices within spectrum space defined by a frequency band and a geographic area. Interference occurring between adjacent spectrum licences consists of in-band interference, across the geographic boundaries, and out-of-band interference, across the frequency boundaries. Interference can also occur between spectrum licensed services and services operating under apparatus and class licensing arrangements.

Spectrum licensed radiocommunications receivers operating in the 700 MHz band could potentially suffer interference caused by radiocommunications transmitters operated under a licence in or adjacent to the 700 MHz band.

Interference is generally managed by a set of interference management tools given effect by the Act and implemented by the ACMA. These tools include:

- > the core conditions of the spectrum licence;
- > a determination made under section 145 of the Act about what constitutes acceptable interference; and
- > advisory guidelines made under section 262 of the Act about managing interference in specific circumstances.

These Advisory Guidelines are made under section 262 of the Act. They aim to assist the ACMA and licensees to manage interference by providing:

- > compatibility requirements for registered fixed receivers operating under spectrum licences issued for the 700 MHz band in order to manage in-band and out-of-band interference;
- > protection from interference caused by fixed transmitters operated under apparatus licenses, class licenses and spectrum licenses issued after the commencement of the *Radiocommunications Spectrum Marketing Plan (700 MHz) 2012*; and
- > advice on the coordination of spectrum-licensed services with television broadcast services that may be in operation following the commencement of the spectrum licence.

The ACMA will take these Advisory Guidelines into account when determining whether a spectrum licensee is causing interference to a licensed receiver that is operating in accordance with its licence conditions.

These Advisory Guidelines do not limit the actions of a spectrum licensee in negotiating operating or protection requirements with another licensee.

Consultation

The ACMA has engaged extensively with stakeholders about its plans to develop a spectrum licensing technical framework for the 700 MHz band.

On 24 June 2010, after examining responses to the DBCDE's Digital Dividend Green Paper on possible uses of this spectrum, the Minister for Broadband Communications and the Digital Economy (the **Minister**) announced that the digital dividend would consist of 126 MHz of contiguous spectrum in the frequency range 694 MHz to 820 MHz², and in July 2010, the Minister directed the ACMA to clear 126 MHz of digital dividend spectrum (694–820 MHz).³

In October 2011, the ACMA set up a short-term industry technical liaison group (the **TLG**) to support the development of a technical framework for the 700 MHz band. The TLG was asked to consider and provide advice to the ACMA on technical aspects required for the development of the spectrum licence technical framework. This included advice on the following:

- > the development of the core conditions of the spectrum licensed band in accordance with section 66 of the Act;
- > the development of the section 145 determination on unacceptable levels of interference;
- > the development of any associated advisory guidelines made under section 262 of the Act;
- > the development of the draft spectrum licence; and
- > the development of the minimum contiguous bandwidth for spectrum licences in the 700 MHz band.

The ACMA developed three papers which outlined its proposed approach to the spectrum licensing framework for the 700 MHz band. These papers were made available by the ACMA to the TLG members for comment. These papers can be found on the ACMA's website.⁴

The ACMA had regard to the views expressed by the TLG members when preparing the Advisory Guidelines.

The ACMA has also undertaken public consultation in relation to the Advisory Guidelines. On 11 April 2012, the ACMA released the draft legislative instruments for the digital dividend auction (including the Advisory Guidelines) for comment. These instruments were accompanied by an information paper to explain the draft instruments and provide context to assist interested parties in making a submission. The information paper was made available on the ACMA's website⁵, and was publicised via a media release on 11 April 2012, notices on the ACMA website and in the Spectrum Auction e-Bulletin publication. On 24 April 2012, the ACMA also held an industry briefing on the draft legislative instruments for the digital dividend auction. This briefing (conducted through a webinar) outlined key aspects of the ACMA's draft instruments and was aimed at assisting interested parties to make a submission.

² A copy of the media release is available at www.minister.dbcde.gov.au.

³ A copy of this direction (*Australian Communications and Media Authority (Releasing the Digital Dividend) Direction 2010*) can be found at <http://www.comlaw.gov.au>.

⁴ See www.acma.gov.au.

⁵ See <http://engage.acma.gov.au>.

Submissions to the consultation were originally due on 9 May 2012, although this was subsequently extended to 14 May 2012. A total of 11 responses were received.

Statement of compatibility with human rights

Subsection 9(1) of the *Human Rights (Parliamentary Scrutiny) Act 2011* requires the rule maker in relation to a legislative instrument to which section 42 (disallowance) of the *Legislative Instruments Act 2003* applies to cause a statement of compatibility to be prepared in respect of that legislative instrument. This statement is in Attachment B.

Regulatory Impact Analysis

The Office of Best Practice and Regulation (the **OBPR**) has advised that a Regulation Impact Statement is not required for the technical instruments made under section 145 and section 262 of the Act for the digital dividend auction. The OBPR considers that these instruments will have only minor and machinery impacts. The OBPR reference for this assessment is ID 14150.

Documents Incorporated into these Advisory Guidelines by Reference or Otherwise Referred to

These Advisory Guidelines incorporate the following documents by reference, or otherwise referred to:

- > A series of coordination maps showing the exclusion zones required for the protection of digital television transmitters (see item 2(2) of Schedule 3). These maps will be made available the ACMA website.
- > Information on the location and characteristics of the digital television transmitters may be found on the Register of Radiocommunications Licences and in the planning documents associated with the television licence area plans (see Schedule 4). The Register and planning documents are available on the ACMA's website.
- > A number of legislative instruments, namely the *Radiocommunications (Spectrum Licence Allocation – Combinatorial Clock Auction) Determination 2012*, the *Radiocommunications Spectrum Marketing Plan (700 MHz) 2012* and the *Radiocommunications (Unacceptable Levels of Interference – 700MHz Band) Determination 2012*. These instruments may, once made, be found on the Australian Government's ComLaw website (www.comlaw.gov.au).

Detailed Description of the Instrument

Details of the Advisory Guidelines are in Attachment A.

NOTES ON SECTIONS

Part 1 – Preliminary

Section 1.1 – Name of Advisory Guidelines

This section gives the citation for the Advisory Guidelines.

Section 1.2 – Commencement

This section provides that these Advisory Guidelines commence on the day after they are registered.

Section 1.3 – Purpose

This section outlines the purpose of these Advisory Guidelines which is to manage interference by providing recommended compatibility requirements for registered fixed receivers operating under spectrum licences issued in the 700 MHz band. The compatibility requirements aim to assist operators of services to plan their services in order to manage interference, or resolve interference issues, which may be caused by transmitters operated under other licences.

Section 1.4 – Interpretation

This section provides definitions for terms used in these Advisory Guidelines. Some terms used in these Advisory Guidelines have the same meaning as in the *Radiocommunications (Unacceptable Levels of Interference – 700 MHz Band) Determination 2012* and the Act.

Part 2 – Background

Section 2.1 – Interference

This section sets out the two categories of interference:

- > in-band interference, which is interference between devices operating in the same frequency band but in different geographic areas; and
- > out-of-band interference, which is interference between devices operating at different frequencies but in the same, or a nearby, geographic area.

Section 2.2 – Interference management

This section lists the ways that this interference can be managed under the Act, and outlines the different interference scenarios which these guidelines are designed to deal with.

Part 3 – Managing interference from other services

Section 3.1 – In-band interference

This section explains the methods through which in-band interference to a radiocommunications receiver operated under a spectrum licence caused by spectrum, apparatus and class licensed transmitters is to be managed.

If interference is from an adjacent spectrum licensed transmitter, it is managed through the core conditions of the licence and the device boundary criteria of the section 145 determination.

If interference is caused by an apparatus-licensed transmitter issued after the date the *Radiocommunications Spectrum Marketing Plan (700 MHz Band) 2012* (the **Marketing Plan**) starts, it is managed as if the transmitter is operated under a spectrum licence. This means that the same device boundary criterion that applies to spectrum-licensed radiocommunications transmitters applies to those apparatus licensed radiocommunications transmitters.

If interference is caused by a class-licensed radiocommunications transmitter, the interference management framework contained in the relevant class licence applies.

This section also indicates that the ACMA will not regard in-band interference to a radiocommunications receiver operating under a spectrum licence caused by a transmitter operating under a class licence as unacceptable if the transmitter is operated in accordance with all relevant conditions of the class licence.

The note to the section states that spectrum licences must accept any interference caused by apparatus-licensed transmitters whose licences were issued before the start of the Marketing Plan.

Section 3.2 – Out-of-band interference

This section explains what constitutes out-of-band interference in a radiocommunications receiver operated under a spectrum licence and how it can be managed through compatibility requirements for receivers.

Out-of-band interference can occur when radiocommunications transmitters are either near in frequency or distance. It may consist of intermodulation products, harmonic signals, parasitic signals or other spurious signals generated at site or arriving at the radiocommunications receiver.

Out-of-band interference may extend for significant frequency separations on either side of a spectrum licence and its severity may depend on the quality of the radiocommunications receiver. For these reasons, this section explains that out-of-band interference is managed through the definition of a notional receiver performance level and a compatibility requirement for co-ordination with other licensed services. The use of a performance standard for spectrum-licensed radiocommunications receivers ensures that the burden of mitigating interference is not solely placed on the radiocommunications transmitter side.

The note to the section states that spectrum licences must accept any interference caused by apparatus-licensed transmitters whose licences were issued before the start of the Marketing Plan.

Part 4 – Requirements for receiver protection

Section 4.1 – Recording radiocommunications receiver details in the Register

This section explains that a receiver will not be afforded protection unless the details of the receiver are included in the Register of Radiocommunications Licences. In order to meet the compatibility requirement in section 5.1, a fixed radiocommunications receiver operated under a 700 MHz band spectrum licence must have its details included in the Register before the date that the radiocommunications transmitter with which compatibility is sought has its details recorded in the Register.

Section 4.2 – Mobile and nomadic devices

This section explains that the compatibility requirements are not applicable to mobile or nomadic devices.

Section 4.3 – Notional receiver performance

This section explains why a notional receiver performance level is needed. The level of interference experienced by a receiver is in part dependent on the quality of the receiver. Emissions from a transmitter should not have to be reduced below a point where the performance of the receiver is the main cause of the problem. As a result, it is necessary to establish a benchmark performance level for radiocommunications receivers.

This section explains that the benchmark performance level for receivers in the 700 MHz band is set out in Schedule 1 of the Advisory Guidelines. It also states that a receiver will need to meet this benchmark to receive protection from interference.

Part 5 – Compatibility requirement

Section 5.1 – Compatibility

This section sets out the general requirements to be met for a fixed radiocommunications receiver to receive protection from interference. A fixed radiocommunications receiver must:

- > have at least the notional level of receiver performance set out in Schedule 1;
- > meet the compatibility requirement of the minimum wanted signal level set out in Schedule 2;
- > be included in the Register before the transmitter with which compatibility is sought is recorded in the Register; and
- > operate with an effective antenna height that complies with paragraph 5.1(1)(d).

Schedule 1 – Notional receiver performance level

This schedule provides spectrum licensees with information regarding the notional performance of receivers operating in the 700 MHz band. The schedule provides information relating to:

- receiver adjacent channel selectivity;
- receiver intermodulation response rejection;
- receiver blocking; and
- spurious response immunity.

It also provides information on measuring these values, and assumptions that can be made regarding notional receivers.

Spectrum-licensed radiocommunications receivers operating in the 700 MHz band should meet this performance level in order to minimise interference from transmitters operating under other types of licences.

Schedule 2 – Compatibility requirement

This schedule outlines what minimum level of wanted signal is to be protected from interference at an otherwise compatible receiver in the 700 MHz band. The note clarifies that this requirement is only for managing out-of-band interference.

Schedule 3 – Managing interference to 700 MHz band receivers from broadcast services that may continue to operate in the 694-820 MHz band after the reallocation period

This schedule describes how information about broadcasting services or retransmission services in the 700 MHz band will be available, and can be used by spectrum licensees to assess the potential for interference to their receivers from these services.

The schedule indicates that the ACMA will publish a set of coordination maps showing exclusion zones required for the protection of digital television receivers. The maps will be available on the ACMA's website. The maps will not define the separation distance required to protect spectrum licensed receivers. However, spectrum licences may use the data on operating digital television transmitters to determine the separation zones that they may wish to implement to protect their receivers operating under their spectrum licence(s).

Schedule 4 – Managing interference from frequency adjacent digital television transmitters to 700 MHz band receivers

This schedule notes that information on adjacent band broadcasting services will be available in the Register, and that spectrum licensees should be able to manage interference to their own receivers using this information.

Statement of Compatibility with Human Rights

Prepared in accordance with Part 3 of the Human Rights (Parliamentary Scrutiny) Act 2011

Radiocommunications Advisory Guidelines (Managing Interference to Receivers – 700 MHz Band) 2012

This legislative instrument is compatible with the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

Overview of the Legislative Instrument

Section 262 of the Radiocommunications Act 1992 (**Act**) permits the Australian Communications and Media Authority (**ACMA**) to may make advisory guidelines about any aspect of radiocommunication or radio emissions.

The purpose of the *Radiocommunications Advisory Guidelines (Managing Interference to Receivers – 700 MHz Band) 2012* (the **Advisory Guidelines**) is to provide for the protection of radiocommunications receivers operating under spectrum licences issued in the 700 MHz band from interference which may be caused by transmitters operated under other licences.

Subsection 9(1) of the *Human Rights (Parliamentary Scrutiny) Act 2011* requires the rule maker in relation to a legislative instrument to which section 42 (disallowance) of the *Legislative Instruments Act 2003* (the **LIA**) applies to cause a statement of compatibility to be prepared in respect of that legislative instrument.

The Advisory Guidelines are a legislative instrument that is subject to disallowance under section 42 of the **LIA**.

Human Rights Implications

The Advisory Guidelines do not engage any of the applicable rights or freedoms.

Conclusion

The Advisory Guidelines are compatible with human rights as they do not raise any human rights issues.