EXPLANATORY STATEMENT

Approved by the Australian Communications and Media Authority

Radiocommunications Act 1992

Radiocommunications (Unacceptable Levels of Interference – 26 GHz Band) Determination 2020

Authority

The Australian Communications and Media Authority (**the ACMA**) has made the *Radiocommunications (Unacceptable Levels of Interference – 26 GHz Band) Determination 2020* (**the instrument**) under subsection 145(4) of the *Radiocommunications Act 1992* (**the Act**).

Section 145 of the Act provides that the ACMA may refuse to include details of a radiocommunications transmitter that is proposed to be operated under a spectrum licence in the Register of Radiocommunications Licences, maintained by the ACMA under Part 3.5 of the Act. The ACMA may so refuse where it is satisfied that the transmitter could cause an unacceptable level of interference to the operation of other radiocommunications devices under that spectrum licence or any other licence. Subsection 145(4) of the Act provides that the ACMA may determine, by written instrument, what are unacceptable levels of interference for the purposes of section 145 of the Act.

Purpose and operation of the instrument

A spectrum licence permits a licensee, subject to specified conditions, to operate radiocommunications devices within a particular 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.

Section 69 of the Act requires each spectrum licence to include a condition that a radiocommunications transmitter must not be operated under the licence unless the requirements of the ACMA under Part 3.5 of the Act for registration of transmitters have been met.

The instrument aims to ensure that high levels of emission from radiocommunications transmitters operated under a spectrum licence issued in the part of the spectrum from 25.1 GHz to 27.5 GHz (the **26 GHz band**) are kept within the geographic area and frequency band of the licence.

The instrument sets out what is meant by an 'unacceptable level of interference' in relation to a radiocommunications transmitter operated under a spectrum licence issued in the 26 GHz band. If the ACMA is satisfied that the operation of the radiocommunications transmitter could cause interference of the kind set out in the instrument, the ACMA will be able to refuse to register a radiocommunications transmitter.

A provision-by-provision description of the instrument is set out in the notes at **Attachment A**.

The instrument is a disallowable legislative instrument for the purposes of the *Legislation Act 2003* (**the LA**).

Documents incorporated by reference

Subsection 314A(2) of the Act provides that an instrument under the Act may make provision in relation to a matter by applying, adopting or incorporating (with or without modifications) matter contained in any other instrument or writing as in force or existing at a particular time or from time to time. The instrument incorporates the following by reference, as existing from time to time:

- 3 Second SRTM Derived Digital Elevation Model (DEM) Version 1.0 (**DEM-3S**), created by Geoscience Australia, and available free of charge from its website at http://www.ga.gov.au (Geoscience Australia has also published a smoothed variation of DEM-3S. This smoothed variation contains different elevation data than DEM-3S and is not to be used for the purposes of this instrument);
- the Australian Spectrum Map Grid 2012, published by the ACMA, and available free of charge from its website at http://www.acma.gov.au;
- the Radio Regulations, published by the International Telecommunication Union (**ITU**). The Radio Regulations contains Articles, Appendices, Resolutions and Recommendations of the ITU relating to international radiocommunications coordination. The Radio Regulations are available, free of charge, from the ITU's website: www.itu.int; and
- three recommendations published by the ITU through its Radiocommunications Sector, which are available, free of charge, from the ITU's website: www.itu.int:
    - Recommendation ITU-R P.525-4 Calculation of free-space attenuation;
    - Recommendation ITU-R P.526-15 Propagation by diffraction;
    - Recommendation ITU-R P.2108-0 Prediction of clutter loss.

The instrument also incorporates the designation of the Geocentric Datum of Australia in Commonwealth of Australia *Gazette* GN 35, dated 6 September 1995 (**GDA94**), as in existence on that date. Gazette GN 35 is available, free of charge, from the Federal Register of Legislation: www.legislation.gov.au.

Consultation

Before the instrument was made, the ACMA was satisfied that consultation was undertaken to the extent appropriate and reasonably practicable, in accordance with section 17 of the LA.

In November 2019, the ACMA set up a short-term industry technical liaison group (**TLG**) to support the development of a technical framework to support the introduction of 5th generation wireless broadband services in the 26 GHz 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 in the 26 GHz band. These included:

- the development of the core conditions of the spectrum licensed band in accordance with section 66 of the Act;
- the development of the instrument;
- the development of any associated advisory guidelines to be made under section 262 of the Act;
- the development of a draft spectrum licence; and
- the development of a minimum contiguous bandwidth for spectrum licences in the 26 GHz band.

The ACMA developed papers which outlined its proposed approach to the spectrum licensing framework for the 26 GHz 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. The ACMA had regard to the views expressed by the TLG members when preparing the instrument.

A draft version of the instrument was released for public consultation on 9 July 2020, together with the consultation paper *26 GHz band spectrum licence technical framework*. Consultation closed on 10 August 2020.

The ACMA consultation sought stakeholder views on the proposed spectrum licence technical framework. The ACMA received 11 written submissions in response to this consultation paper. The only comments related to the instrument dealt with minor issues such as typographical errors.

Regulatory impact assessment

A preliminary assessment of the proposal to make the instrument was conducted by the Office of Best Practice Regulation (**OBPR**), based on information provided by the ACMA, for the purposes of determining whether a Regulation Impact Statement (**RIS**) would be required. OBPR advised that a RIS would not be required because the proposed regulatory change is minor or machinery in nature – OBPR reference number 24947.

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 LA applies to cause a statement of compatibility with human rights to be prepared in respect of that legislative instrument.

The statement of compatibility set out below has been prepared to meet that requirement.

Overview of the instrument

Section 69 of the Act requires each spectrum licence to include a condition which specifies that a radiocommunications transmitter must not be operated under the licence unless the requirements of the ACMA under Part 3.5 of the Act for registration of transmitters have been met.

Under subsection 145(1) of the Act, the ACMA may, if it is satisfied that the operation of a radiocommunications transmitter could cause an unacceptable level of interference to other radiocommunications devices, refuse to register the transmitter. The instrument sets out what is meant by an 'unacceptable level of interference' in relation to a radiocommunications transmitter operated under a spectrum licence issued in the 26 GHz band. The requirements provided in the instrument only apply in relation to 26 GHz band spectrum licensees.

Human rights implications

The ACMA has assessed whether the instrument is compatible with human rights, being the rights and freedoms recognised or declared by the international instruments listed in subsection 3(1) of the *Human Rights (Parliamentary Scrutiny) Act 2011* as they apply to Australia.

Having considered the likely impact of the instrument and the nature of the applicable rights and freedoms, the ACMA has formed the view that the instrument does not engage any of those rights or freedoms.

Conclusion

The instrument is compatible with human rights as it does not raise any human rights issues.

Attachment A

Notes to the *Radiocommunications (Unacceptable Levels of Interference – 26 GHz Band) Determination 2020*

Section 1 Name

This section provides for the instrument to be cited as the *Radiocommunications (Unacceptable Levels of Interference – 26 GHz Band) Determination 2020*.

Section 2 Commencement

This section provides for the instrument to commence at the start of the day after the day it is registered on the Federal Register of Legislation.

The Federal Register of Legislation may be accessed free of charge at www.legislation.gov.au.

Section 3 Authority

This section identifies the provision of the Act that authorises the making of the instrument, namely subsection 145(4) of the *Radiocommunications Act 1992* (**the Act**).

Section 4 Definitions

This section defines a number of key terms used throughout the instrument. It also provides that the range of numbers that identifies a frequency band includes the higher, but not the lower, number.

A number of other expressions used in the instrument are defined in the Act.

Section 5 References to other instruments

This section provides that in the instrument, unless the contrary intention appears:

- a reference to any other legislative instrument is a reference to that other legislative instrument as in force from time to time; and
- a reference to any other kind of instrument is a reference to that other instrument as in force from time to time or existing from time to time.

Section 6 Emission designator

This section provides that the designation of a radiocommunications transmitter's emission is to be worked out using the methods set out in the Radio Regulations, made by the ITU. It also provides that, for the purposes of determining this designation, the occupied bandwidth of the transmitter should be used as the bandwidth. The designation of a radiocommunications transmitter's emission is relevant for the coordination and identification of radio emissions and is also used when determining whether two or more fixed transmitters are a group of radiocommunications transmitters under section 7 of the instrument.

Section 7 Group of radiocommunications transmitters

This section defines what 'a group of radiocommunications transmitters' is for the purpose of the instrument. A group of radiocommunications transmitters consists of two or more fixed transmitters at a common site that have common features. Including radiocommunications transmitters within a group may make registration of devices easier for licensees.

Section 8 Group of radiocommunications receivers

This section defines what 'a group of radiocommunications receivers' is for the purpose of the instrument. A group of radiocommunications receivers consists of two or more fixed receivers, located at a common site, that have certain features in common. Inclusion of radiocommunications receivers within a group may make registration of devices easier for licensees.

Section 9 Unacceptable level of interference

This section provides the technical definition of what will be deemed unacceptable levels of interference for the purpose of interference management in the 26 GHz band. A radiocommunications transmitter producing emissions that are found to cause unacceptable levels of interference to other services will, in most circumstances, not be registered on the Register of Radiocommunications Licenses for operation under a spectrum licence in the band, in accordance with subsection 145(1) of the Act. Licensees who operate such devices without registration will be in breach of the condition included in the licence because of section 69 of the Act and may become subject to further compliance action under the Act.

Under section 9, a transmitter is taken to be causing unacceptable interference if:

- the operation of the transmitter breaches the core conditions of the licence relating to the maximum permitted level of radio emissions from the radiocommunications transmitter outside the geographic and frequency boundaries of the licence; or
- subject to the exceptions below, any part of the 'device boundary' of the transmitter lies outside the geographic area of the licence. The 'device boundary' is a theoretical boundary calculated around the device using the methodology set out in the Schedules to the instrument; or
- the device boundary of the transmitter cannot be calculated in accordance with Part 1 of Schedule 2 to the instrument.

Subsection 9(2) provides for an exception in the case where:

- the device boundary is calculated to include a point that lies outside the Australian Spectrum Map Grid (**ASMG**) (that is, outside Australia); and
- a line from that point to the location of the relevant radiocommunications transmitter does not pass over the geographic area of another spectrum licence in the 26 GHz band.

Subsection 9(3) provides for an exception in the case where:

- the device boundary is calculated to include a point that lies outside the geographic area of the licence, but inside the part of the ASMG represented by the identifier MW4H6; and
- a line from that point to the location of the relevant radiocommunications transmitter does not pass over the geographic area of another spectrum licence in the 26 GHz band.

Subsection 9(4) provides that if, in the calculation of the device boundary, a point lies outside the geographic area of the licence and it is connected to a radial (calculated in accordance with Schedule 2) that, when outside the geographic area of the licences, only crosses over water, then the device is not declared to be causing unacceptable interference.

In each of these cases, the fact that the device boundary is located outside of the geographic area of the licence does not mean that the transmitter is taken to be causing unacceptable interference. (The transmitter may, however, be taken to be causing unacceptable interference for other reasons.)

The ASMG is set out in the Australian Spectrum Map Grid 2012, available from the ACMA's website. It is used to identify the geographic areas of spectrum licences. In accordance with paragraph 66(1)(c) of the Act, a condition specifying the geographic area within which operation of radiocommunications devices is permitted under the licence, is a core condition of a spectrum licence.

The ASMG provides a hierarchical cell identification scheme (**HCIS**), which is intended to provide greater clarity, flexibility and certainty in identifying the geographic area of spectrum licences for the purposes of issue or trading. The HCIS identifier included in subsection 9(3) covers an area in the Australian Capital Territory west of Canberra, in which the Canberra Deep Space Communications Complex is located.

Further details about the ASMG can be found in the Australian Spectrum Map Grid 2012, available from the ACMA website: www.acma.gov.au.

Section 10 Accuracy

Section 10 specifies that values of parameters estimated for the purpose of Schedules 2 or 3 must be estimated with a level of confidence of not less than 95 percent that the true or actual value of the parameter of a radiocommunications transmitter will be below the requirement specified in Schedules 2 or 3. That is to say, an estimate must have a likelihood of 95 percent or greater of being within the requirement for the parameter.

Schedule 1 – Location of a transmitter

This Schedule sets out how to work out the location of a radiocommunications transmitter (and the location of a group of radiocommunications transmitters), in terms of the location of the centre of the antenna or antennas specified in latitude and longitude.

Schedule 2 – Device boundaries and device boundary criteria

This Schedule sets out the technical procedure for calculating the device boundary of a radiocommunications transmitter or group of radiocommunications transmitters, which is relevant for the application of section 9 of the instrument. Under paragraph 9(1)(b) of the instrument, a transmitter is taken to cause an unacceptable level of interference if its device boundary lies outside the geographic area of the spectrum licence, subject to some exceptions. Under paragraph 9(1)(c) of the instrument, a transmitter is also taken to cause an unacceptable level of interference if the device boundary of the transmitter cannot be calculated in accordance with Part 1 of Schedule 2.

Part 1 of Schedule 2

Part 1 of the Schedule details the steps involved in calculating the device boundary. The calculation is an iterative process and involves testing whether the device boundary criterion specified in Part 2 is met at increasing distances (of 100 metre increments) from the transmitter along radial lines spaced around the centre location of the transmitter (worked out in accordance with Schedule 1). The latitude and longitude of the first point on a radial where the device boundary criterion is less than or equal to zero is considered to be the furthest point of the device boundary on this radial. There are 360 radials for each transmitter, meaning there are 360 points that form the device boundary.

If the end point of any radial in relation to a transmitter is outside the geographic area of the licence, then unless an exception applies, the transmitter will be taken to cause an unacceptable level of interference.

Part 2 of Schedule 2

Part 2 provides the device boundary criterion, which is the mathematical expression used to calculate a device boundary in accordance with Part 1 of this Schedule. The mathematical expression consists of the horizontally radiated power of a device minus the path loss function. The device boundary criterion has function dependencies which include the horizontally radiated power, the receiver level of protection and the propagation loss set out in Part 3 of this Schedule, for each segment along each radial.

Part 3 of Schedule 2

Part 3 provides the methodology for determining the propagation loss component for determining the device boundary criterion in Part 2. This part refers to specific ITU-R Recommendations which detail the method and parameters to be used to calculate the propagation loss. This part also details how relevant parameters, which are used in the calculation of propagation loss, are to be determined.

Schedule 3 – Antenna height and average ground height

Part 1 of Schedule 3

Part 1 of this Schedule specifies the procedure for calculating effective antenna height for the purpose of the instrument, taking account of average ground height above sea level and antenna height above ground. The effective antenna height of a spectrum-licensed radiocommunications device is used to calculate the propagation loss component of the device boundary criterion. The device boundary criterion is set out in Part 2 of Schedule 2. The device boundary criterion is the mathematical expression used to calculate a device boundary. The process for calculating a device boundary is set out in Part 1 of Schedule 2.

Part 2 of Schedule 3

Part 2 of this Schedule sets out the procedure for calculating the average ground height of a point on any radial from the location of a radiocommunications transmitter. It does so by taking account of the height of the cell in the digital elevation model corresponding to that point, and the surrounding cells.

These heights are calculated with reference to a digital elevation model sourced from Geoscience Australia.

Part 3 of Schedule 3

Part 3 provides the mathematical formula for Vincenty's Formula, which is used in the calculation of the coordinates (in latitude and longitude) of the points along the radials about the transmitter in Part 1. These coordinates are used in Part 2 to obtain the average ground height for that point for use in Part 1. This simplification of Vincenty's Formulae performs location calculations over the GRS80 ellipsoid as referenced by the GDA94 to a high degree of accuracy, using an iterative routine.