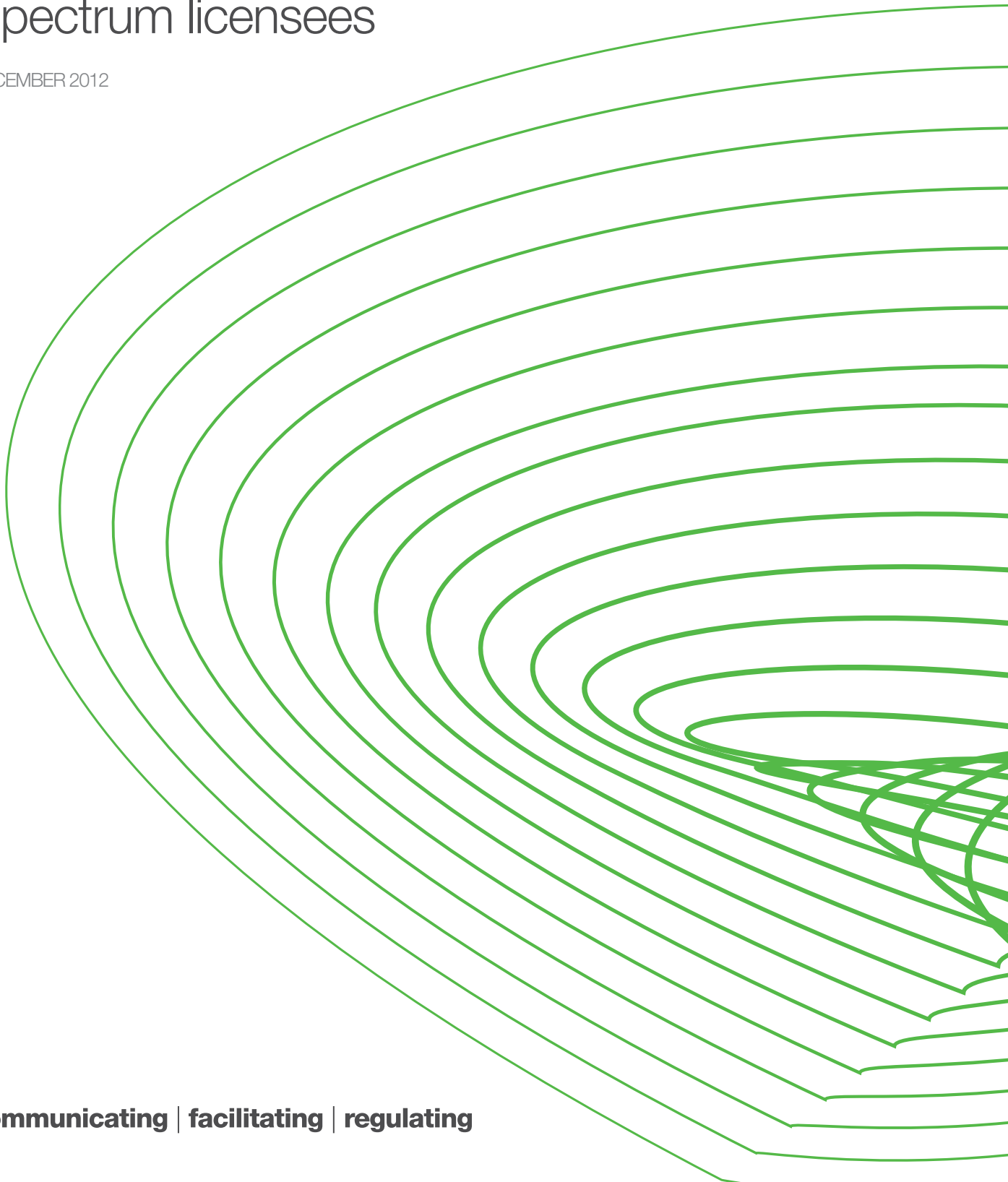


Know your obligations

Spectrum licensees

DECEMBER 2012



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Introduction

This publication has been prepared by the Australian Communications and Media Authority (the ACMA) as a guide to the key obligations placed on spectrum licensees under the [Radiocommunications Act 1992](#). The spectrum licence is one of three licence types that the ACMA may issue to a person authorising access to the radiofrequency spectrum in Australia.

The obligations discussed in this publication fall into two main categories:

- > regulations governing the acquisition and trading of spectrum licences
- > technical requirements designed to manage radiofrequency interference between spectrum users.

As the Australian regulator of radiocommunications, telecommunications, broadcasting and the internet, the ACMA is responsible for ensuring compliance with the Radiocommunications Act. It is important that licensees are aware of any changes to legislation and regulatory arrangements affecting spectrum licensees.

Know your obligations is intended only as a general guide. It covers a range of regulatory arrangements of generic application to spectrum licensees and directs the reader to further information about arrangements specific to various frequency bands or locations. Information in this publication should not be regarded as a substitute for the relevant legislation and regulatory documents. You are encouraged to seek professional advice about the obligations outlined in this guide.

1 Licensed access to the radiofrequency spectrum

This section describes how people can legally access and use the radiofrequency spectrum in Australia. It provides information about the types of licences the ACMA issues and the authorisations that licensees can grant to others. The concept of spectrum space is explained.

The radiofrequency spectrum is the portion of the electromagnetic spectrum that can be used for wireless communications such as radio, radar or television.¹

Subject to certain exceptions, under Australian legislation a person must not operate a radiocommunications device except as authorised by a spectrum licence, an apparatus licence or a class licence issued under the Radiocommunications Act. The ACMA is the body responsible for issuing those licences within Australia.

1.1 Licence types

There are currently three types of licences provided for under the Radiocommunications Act.

1.1.1 [Apparatus licences](#)

Apparatus licences are issued under Part 3.3 of the Radiocommunications Act. They are issued to a person and authorise the operation of specified radiocommunications devices (transmitters or receivers) or other devices of a kind specified under the Act. This approach uses different licence categories to specify the operational conditions for various types of services; for example, broadcast, fixed or land mobile. There are 17 transmitter licence types and five receiver licence types specified by the ACMA for the purposes of the Radiocommunications Act.

Subject to certain exceptions, apparatus licences may be issued for terms of up to five years and can be renewed before expiry.

1.1.2 [Class licences](#)

Class licences are issued under Part 3.4 of the Radiocommunications Act. They are not issued to a single licensee but on a shared basis, and do not incur licence fees. Any person may operate a radiocommunications device under a class licence, as long as the operation complies with the conditions of the licence.

To date, the ACMA has issued 12 class licences authorising the operation of a wide range of radiocommunications devices, including remote control devices, citizen band radio, cordless telephones and mobile phone handsets.

1.1.3 [Spectrum licences](#)

Spectrum licences are issued under Part 3.2 of the Radiocommunications Act. They authorise the holder of the licence to operate radiocommunications devices within a specified 'spectrum space', which is defined by frequency bandwidth and geographic area (see section 1.2.2).

¹ Volume 1 (Article 5) of the ITU Radio Regulations allocates frequencies within the range 9 kHz to 275 GHz and, for the purposes of this paper, is considered the range of the radiofrequency spectrum.

Licensees can operate any type of radiocommunications device for any purpose, provided they comply with the licence conditions and technical frameworks relevant to the licence. The technical framework is designed to manage interference to other spectrum users.

Spectrum licences can be issued for up to 15 years. At the end of the licence term, the default option under the Radiocommunications Act is for the licence to be subject to reallocation via a price-based allocation process, such as an auction. However, the licence can be reissued to the incumbent licensee in specified circumstances in accordance with the Radiocommunications Act.

This publication is concerned only with spectrum licences.



MORE INFORMATION

Radiocommunications licences

- > see Chapter 3 of the [Radiocommunications Act](#)
- > see [Radiocommunications licensing](#) section of the ACMA website
- > contact the ACMA's Radiocommunications Licensing and Telecommunications Deployment Section on 1300 850 115 or email LAIS@acma.gov.au.

1.2 Spectrum licences

1.2.1 Obtaining access to spectrum under a spectrum licence

The ACMA can only issue a spectrum licence in frequency bands that have been designated or declared for allocation by spectrum licensing.

- > Spectrum that is declared for reallocation is usually encumbered. The reallocation declaration requires existing apparatus licences to relocate from the band by the end of the nominated reallocation period. The spectrum is subject to allocation via a price-based allocation process (usually an auction) within the first 12 months of the reallocation period. This time frame is referred to as the reallocation deadline.
- > Spectrum that is designated for spectrum licensing may be either encumbered or unencumbered. When unencumbered, the spectrum is allocated via a price-based allocation process (usually an auction). However, if encumbered spectrum space is subject to designation, any existing apparatus licensees in the band are offered a spectrum licence to replace their existing apparatus licences. These licences are offered at a pre-determined price. This process is referred to as conversion.

Spectrum licences are generally offered at auction. Where auctions do not result in the complete sale of all spectrum space (or lots) on offer, residual auctions may be staged for the remaining lots. Where there is a single applicant for spectrum space, the ACMA may negotiate sale of the licence to the applicant at a pre-determined or negotiated price.

An interested party can obtain access to spectrum under a spectrum licence by:

- > participating in auctions of spectrum conducted periodically by the ACMA
- > trading with or acquiring a licence from an existing spectrum licence-holder (see section 5.1)
- > obtaining a third-party authorisation from an existing licence-holder to use the whole or part of their spectrum (see section 5.2).

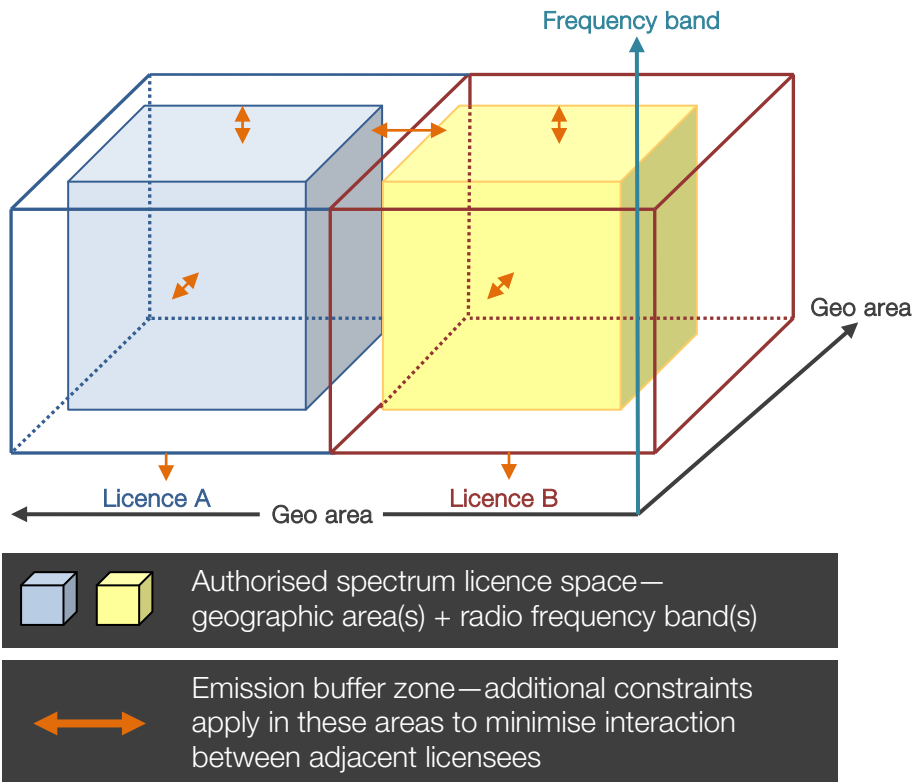
1.2.2 Spectrum space

The concept of spectrum space is fundamental to the ACMA's approach to spectrum licences. Spectrum space is tradeable and may be aggregated with other spectrum space or divided into smaller spaces. This allows the possibility of combining and/or subdividing spectrum licences according to market needs.

Spectrum space is considered to exist in three dimensions, represented in Figure 1. The **x-y** dimensions represent a geographical area (latitude and longitude), which is based on cells in the [Australian spectrum map grid 2012](#) (ASMG). The **z- or vertical** dimension represents the upper and lower frequency boundary of the licence.

In Figure 1, the outer cubes represent the licence boundaries and the inner cubes the most flexible spectrum occupancy, taking into account deployment constraints, device boundary criterion and outside-the-band emission limits. These issues are discussed further in Chapter 2.

Figure 1 Spectrum space



1.2.3 Describing the spectrum space—Australian Spectrum Map Grid

The ASMG is defined in both Australian Geodetic Datum 1966 (AGD66) and Geocentric Datum of Australia 1994 ([GDA94](#)) to allow backward compatibility between existing and future spectrum licences. The ASMG cells can also be described using the 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, and applies to both AGD66 and GDA94.



MORE INFORMATION

Spectrum space and the ASMG

> see [spectrum licences](#) on the ACMA website.

2 Spectrum licence conditions

This section provides information about the spectrum licence conditions that the ACMA imposes in accordance with the Radiocommunications Act. They include core conditions (discussed in section 3.1), statutory conditions and provisions for the tenure of the licence.

Spectrum licences authorise the use of a parcel of spectrum space. Licensees are able to deploy radiocommunications devices anywhere within their spectrum space, as long as the operation of the device complies with the core conditions and technical framework applicable to the licence under which the device operates.

Each spectrum licence includes core conditions and statutory conditions, and may also include other conditions included by the ACMA:

- > **Core conditions** imposed under section 66 of the Radiocommunications Act define the spectrum space within which the licensee is authorised to operate radiocommunications devices under the licence and the maximum permitted level of radio emissions. These conditions are included in all spectrum licences.
- > **Statutory conditions** imposed under sections 67 to 69A of the Radiocommunications Act include conditions about payment of charges, use by third parties, residency, registration of transmitters and devices exempt from registration. These conditions are included in all spectrum licences.
- > **Other conditions** may be placed on licences under section 71 of the Radiocommunications Act to provide for the efficient management of the spectrum and administration of the Radiocommunications Act. These conditions may vary from one band or licence to another.

The Radiocommunications Act also sets out the maximum duration for a spectrum licence, as well as arrangements for the suspension, cancellation or resumption of a spectrum licence in certain circumstances.

2.1 Core licence conditions

The core licence conditions of a spectrum licence are discussed at section 3.1.

2.2 Statutory licence conditions

2.2.1 Spectrum licence taxes and charges

Section 67 of the Radiocommunications Act requires the ACMA to include a condition on a spectrum licence that the licensee meets all obligations to pay:

- > charges fixed by the ACMA under section 60
- > spectrum access charges fixed by a determination made under section 294
- > amounts of spectrum licence tax.

When a spectrum licence is issued as a result of a price-based allocation process undertaken in accordance with section 60 or reissued at the expiry of a licence, the ACMA will make a determination under section 294 of the Radiocommunications Act, specifying the spectrum access charge payable by licensees for the licence. The ACMA may exercise this power under a direction from the minister. The ACMA will not issue a spectrum licence until the spectrum access charge is paid.

The ACMA recovers from spectrum licensees a proportion of the indirect costs of managing the radiofrequency spectrum through an annual spectrum licence tax. The taxation arrangements and the method for calculating each licensee's contribution to the base amount are contained in the [Radiocommunications \(Spectrum Licence Tax\)](#)

[Determination 2000](#). Payment of the applicable annual spectrum licence tax is a condition of each spectrum licence.

The ACMA may also recover its costs for services provided in relation to licences or for any matter in which expenses are incurred. In many instances, the ACMA has set a standard charge for services offered, including registering devices and registering the trading of spectrum space, through the making of a charges determination under section 60 of the *Australian Communications and Media Authority Act 2005*. Payment of relevant charges is a condition of each spectrum licence.

2.2.2 Authorisation of third parties

Section 68 of the Act requires the ACMA to include a condition on a spectrum licence about third-party use of the licence. This issue is discussed further in section 4.1.

2.2.3 Registration requirements for spectrum licensees

Under section 69 of the Radiocommunications Act, spectrum licensees are required to register the radiocommunications transmitters they intend to operate under their licences in the RRL. This does not include a transmitter type that is specifically exempted in a licence condition. Licensees must not operate transmitters unless the transmitters are registered or exempted from registration.

Although not mandatory, the registration of receivers is advised as it helps other licensees to manage interference and because the date of registration of the receiver is one of the matters that the ACMA will consider when settling interference disputes. Registered receivers will receive protection from out-of-band emissions on a first-in-time coordination basis. Receivers that are not registered will not be afforded protection.

2.2.4 Devices exempt from registration

Not all radiocommunications transmitters operated under a spectrum licence are required to be registered before they are operated. The spectrum licence will define the conditions that must be met before such radiocommunications devices are exempt from registration. Typically, this includes low-powered devices such as mobile handsets or devices and femtocells.

2.2.5 Residency requirements

Under section 69A, all spectrum licences must include a condition about residency requiring that, at all times when the licensee derives income, profits or gains from operating radiocommunications devices under the licence, either:

- > the licensee is to be an Australian resident
- > the income, profits or gains are to be attributable to a permanent establishment in Australia through which the licensee carries on business.

This requirement also applies in situations where a third-party authorisation is in place, in relation to the residency of the authorised third party.



MORE INFORMATION

Spectrum licences taxes and ACMA charges

- > see Part 8 of the [Australian Communications and Media Authority Act 2005](#)
- > see the [Radiocommunications \(Charges\) Determination 2007](#)
- > see the [Radiocommunications \(Spectrum Licence Tax\) Act 1997](#)
- > see the [Radiocommunications \(Spectrum Licence Tax\) Determination 2000](#).

Residency requirements

- > see section 69A of the [Radiocommunications Act](#).

2.3 Spectrum licence tenure

2.3.1 Licence term

Spectrum licences may be issued for a period of up to 15 years. Unlike apparatus licences, they are not issued with a presumption of renewal. When spectrum licences expire, the ACMA has two options:

- > undertake a reallocation process (generally an auction) in accordance with section 60 of the Radiocommunications Act
- > reissue licences to the same licensee under section 82 of the Radiocommunications Act if either:
 - > the licence has been used to provide a service that is included in a class of services for which the minister has determined that reissuing licences to the same licensee would be in the public interest
 - > it is satisfied that special circumstances exist, meaning it is in the public interest for the existing licensee to continue to hold the licence.

In accordance with section 78 of the Radiocommunications Act, the ACMA must from time to time publish a notice in the *Government Gazette* stating where information can be obtained about forthcoming expiring spectrum licences. The notice will invite expressions of interest in those spectrum licences.

2.3.2 Licence sanctions—suspending and cancelling spectrum licences

The ACMA's approach to compliance and enforcement involves a graduated use of regulatory measures, using the minimum power or intervention necessary to achieve the desired result. The ACMA may suspend or cancel a spectrum licence if it is satisfied that a licensee or an authorised third party has either:

- > breached a licence condition or the Radiocommunications Act
- > operated a radiocommunications device under the licence, or purportedly under the licence, in breach of any other Commonwealth, state or territory law, whether written or unwritten, or has operated a radiocommunications device in the course of contravening such a law.

Suspension will cease after 28 days (unless revoked sooner) unless proceedings for an offence against the Radiocommunications Act are instituted.

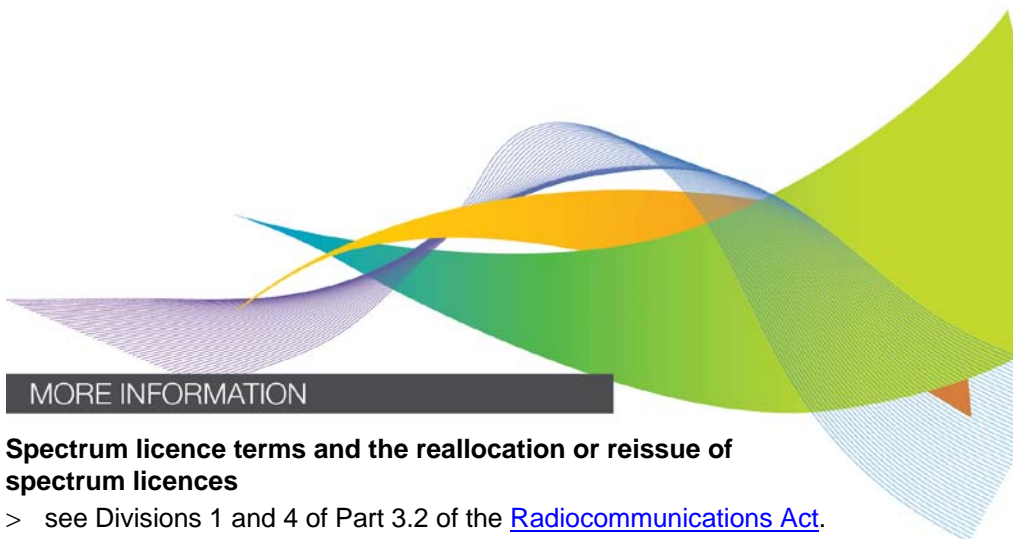
An affected licensee may apply to the ACMA under section 285 of the Radiocommunications Act for reconsideration of a decision to suspend or cancel a spectrum licence.

In the event that a licence condition of any licence including apparatus, class or spectrum licence is breached by a licensee or an authorised third party, spectrum licensees who suffer interference as a result may also be able to pursue a remedy through the courts by undertaking civil proceedings (section 50 of the Radiocommunications Act).

2.3.3 Licence resumption

The ACMA conducts comprehensive planning and consultation activities on future spectrum licensing arrangements. ACMA policy is to provide certainty for licensees and other stakeholders about licence tenure. Nevertheless, the ACMA can resume spectrum licences by agreement or, with the minister's approval, by compulsory process subject to payment of just compensation by the Commonwealth (sections 89 to 95 of the Radiocommunications Act).

The ACMA has not used this power under the Act and generally considers possible replanning opportunities in consultation with incumbent licensees and other interested parties in the Technical Liaison Group process in the lead-up to licence expiry.



MORE INFORMATION

Spectrum licence terms and the reallocation or reissue of spectrum licences

- > see Divisions 1 and 4 of Part 3.2 of the [Radiocommunications Act](#).

Spectrum licence suspension or cancellation

- > see Division 3 of Part 3.2 of the [Radiocommunications Act](#).

Spectrum licence resumption

- > see Division 6 of Part 3.2 of the [Radiocommunications Act](#).

3 Technical frameworks

This section provides an overview of spectrum licence technical frameworks. These frameworks set out the requirements for operating radiocommunications devices under spectrum licences and provide guidance about coordination between devices operating in adjacent spectrum space.

The primary purpose of a spectrum licensing technical framework is to specify the technical requirements for the operation of devices under a spectrum licence, for the purpose of managing interference between users. Although technical frameworks are designed to be technology flexible, they are generally optimised to cater for a technology or technologies that is/are likely to be deployed in the band.

The development of the technical framework is predicated on the assumptions that:

- > good engineering practices are employed in establishing and maintaining services
- > receivers employed by spectrum licensees will meet minimum receiver performance levels for protection from interference²
- > receivers employed by apparatus licensees will meet the relevant level of performance referred to in the advisory guideline that applies to the licensed service in question
- > spectrum licensees will be responsible for managing interference that they, or authorised third parties, cause to their own services by operating devices under any spectrum licence or apparatus licence.

The following general principles were also applied when developing the technical framework:

- > The ACMA has attempted to provide flexibility to spectrum licensees to establish services.
- > Absolute power levels have been specified as emission limits rather than power levels relative to the transmitter power, allowing licensees to strike a balance between the maximum radiated power of a device and its out-of-band performance.
- > The core conditions indirectly specify frequency stability by requiring the emission limits outside the band to be maintained under all conditions. This allows a licensee to balance emission bandwidths along with frequency stability, as well as transmitter rise and fall times to provide 'internal guard bands' as necessary.
- > Spectrum licensees are responsible for managing interference that arises between fixed registered devices operated under their licence and other co-sited fixed registered devices.

A technical framework consists of three interlocking regulatory elements:

- > The **conditions** specified on the licence; in particular, the core conditions that define the asset in the spectrum space and the level of emissions permitted across the boundaries of the licence. See section 3.1.
- > A **determination of unacceptable interference** for the purpose of device registration in each band that may impose deployment constraints on devices. See section 3.2.
- > The **radiocommunications advisory guidelines**, which provide assistance and advice for coordination with other services when and where required. See section 3.3.

² Receivers with poorer interference susceptibility performance can be used, but in those cases licensees may have to use more of their own spectrum space as guard space.

When considering interference management, it is important to note the different roles of the advisory guidelines and the subsection 145(4) determination. The advisory guidelines provide assistance and advice for coordination with other services when and where it is required. The subsection 145(4) determination imposes additional device deployment constraints and provides the mechanism to comply with the spectrum licence conditions.

3.1 Core licence conditions

The core conditions of a spectrum licence are imposed under section 66 of the Radiocommunications Act. They specify mandatory technical requirements that define the licence for the purposes of deploying services under the licence, as well as the trading of spectrum space. They specify the geographic area and frequency band of the licence, as well as the maximum permitted emission levels at the frequency and geographic boundaries of the licence.

The following are the core conditions that must be specified in a spectrum licence.

3.1.1 Area of operation

This core condition specifies the geographic area within which the operation of radiocommunications devices is authorised under the licence. This area is defined by reference to the ASMG and described in the form of HCIS identifiers.

3.1.2 Frequency band of operation

This core condition specifies the frequency band in which radiocommunications devices are authorised to operate under the spectrum licence. This is specified using the upper and lower frequency limits of the band.

3.1.3 Outside-the-area emission limits

This core condition regulates the level of emissions inside the geographic area of the spectrum licence in order to protect geographic and frequency adjacent licensees. In most cases, this is expressed as a maximum horizontally radiated power limit that applies to all transmitters, regardless of where they are located, within the spectrum licence area.

An additional layer of out-of-area emission management is imposed at the point of registration of devices by a determination under section 145 of the Radiocommunications Act (see section 3.2). These limits can be extended by agreement with adjacent licensees, as discussed in section 4.1.6.

3.1.4 Outside-the-band emission limits

This core condition regulates the level of emissions across the frequency boundaries of the licence and includes limits for spurious and non-spurious emissions. Outside-the-band emission limits are usually specified at particular offsets from the band edge of the spectrum licence, and commonly referred to as emission masks.

Outside-the-band emission limits are expressed in the form of absolute levels, rather than levels relative to the transmitter output power, to allow licensees to operate transmitters with an optimised balance between transmit power and out-of-band emission suppression. These levels may be varied through negotiated agreement with affected adjacent licensees, as discussed in section 4.1.6.

3.2 Unacceptable levels of interference

Section 145 of the Radiocommunications Act gives the ACMA the power to refuse to register a radiocommunications transmitter where it is deemed to cause unacceptable interference when operated. The ACMA has determined, under subsection 145(4) of the Radiocommunications Act, what constitutes unacceptable interference in each spectrum-licensed frequency band.

A section 145(4) determination for each band sets out the following basic requirements to manage unacceptable levels of interference. These are that:

- > the core conditions of the licence are met
- > specified deployment constraints are met
- > the specified device boundary criteria are met
- > full details of transmitters are provided for inclusion in the register.

3.2.1 Deployment constraints

Deployment constraints refer to a number of restrictions (other than the device boundary criterion) for the deployment of devices that are defined in the relevant section 145(4) determination. These constraints are designed to help manage interference in spectrum-licensed bands and can include:

- > effective antenna height (typically in the lower band for FDD transmitters)
- > antenna beamwidth
- > EIRP (effective isotropic radiated power).

Deployment constraints typically apply to specific portions of a band, but can also apply to specific geographical areas.

3.2.2 Device boundary criterion

Before registering a device in accordance with a section 145(4) determination, a licensee or accredited person (see section 4.1.6) must, in addition to checking that the core conditions are maintained, calculate the device boundary of the transmitter.

Calculating a device boundary involves establishing the distance along radials from the transmitter at which the emission level must drop below a level that is likely to cause interference to co-channel receivers in adjacent geographic areas. The distance along each radial is based on a mathematical propagation model.

The propagation models make use of average antenna heights based on ground height data for any location in Australia from the [GEODATA 9 Second Digital Elevation Model Version 3](#) (DEM-9S), released by Geoscience Australia.

The effect of the device boundary procedure is to create a 'buffer zone' of reduced emissions by restricting the level of emissions from transmitters in proximity to the geographic boundaries of a licence. It specifies an exact and direct procedure to determine the allowed maximum radiated power of a transmitter that cannot be challenged by an adjacent licensee.

The direct nature of the limit means that licensees can work closer to the geographic boundary of the licence than they could otherwise. In addition, licensees can accurately plan for transmitters that may be operated by adjacent spectrum licensees across the area boundary at any time in the future.

If the device boundary falls outside the geographic area of the relevant spectrum licence, the ACMA will generally refuse to register the device because the levels of emission outside the licence that it would cause would constitute 'unacceptable interference' within the meaning of section 145 of the Act. An exception to this general

rule can be made where there is a core condition agreement. In these circumstances, the agreement provides that a device boundary may exceed the licence boundary of a licensee where the adjacent licensee has specifically agreed to that and accepts any interference caused to its use of the spectrum.



MORE INFORMATION

Unacceptable levels of interference

- > see sections 66 and 145 of the [Radiocommunications Act](#)
- > access and download section 145 determinations on the [ComLaw Website](#).
- > see [interference resolution](#) and [digital elevation models for spectrum licensing](#) on the ACMA website.

3.3 Radiocommunications advisory guidelines

The ACMA may publish radiocommunications advisory guidelines on any aspect of radiocommunications or radio emissions. The ACMA issues guidelines to assist spectrum licensees to coordinate radiocommunications devices operated under their spectrum licence and those operating in surrounding spectrum, including services operating under apparatus or class licences. The guidelines may also be used to assess interference between different spectrum-licensed bands.

The ACMA will generally consider the guidelines when dealing with interference disputes between licensees. A spectrum licence may include a condition that makes it mandatory to employ methods contained in the guidelines. The ACMA will otherwise consider alternative interference management arrangements agreed between licensees where all affected and potentially affected licensees have agreed to those arrangements. Subsequent trading of spectrum will affect any existing agreements.

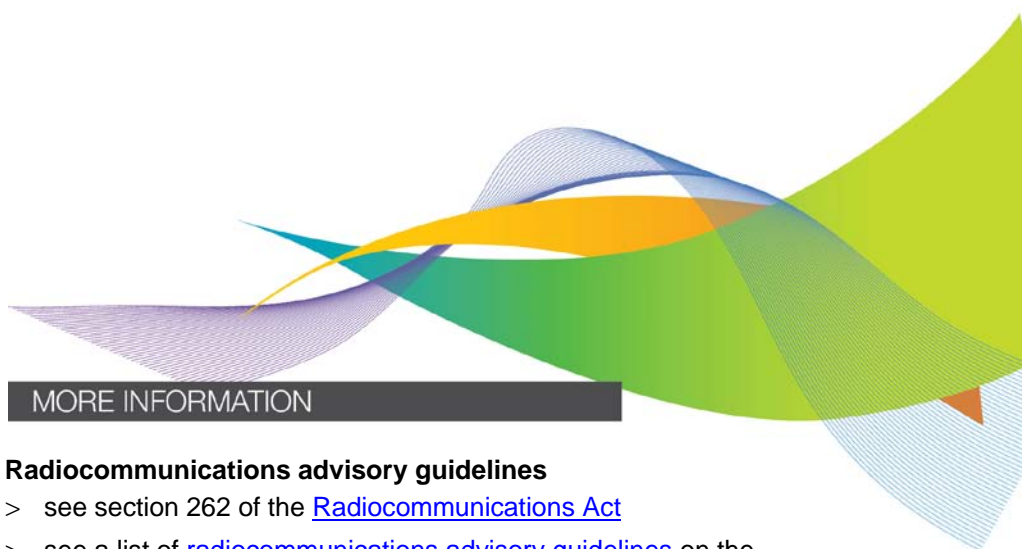
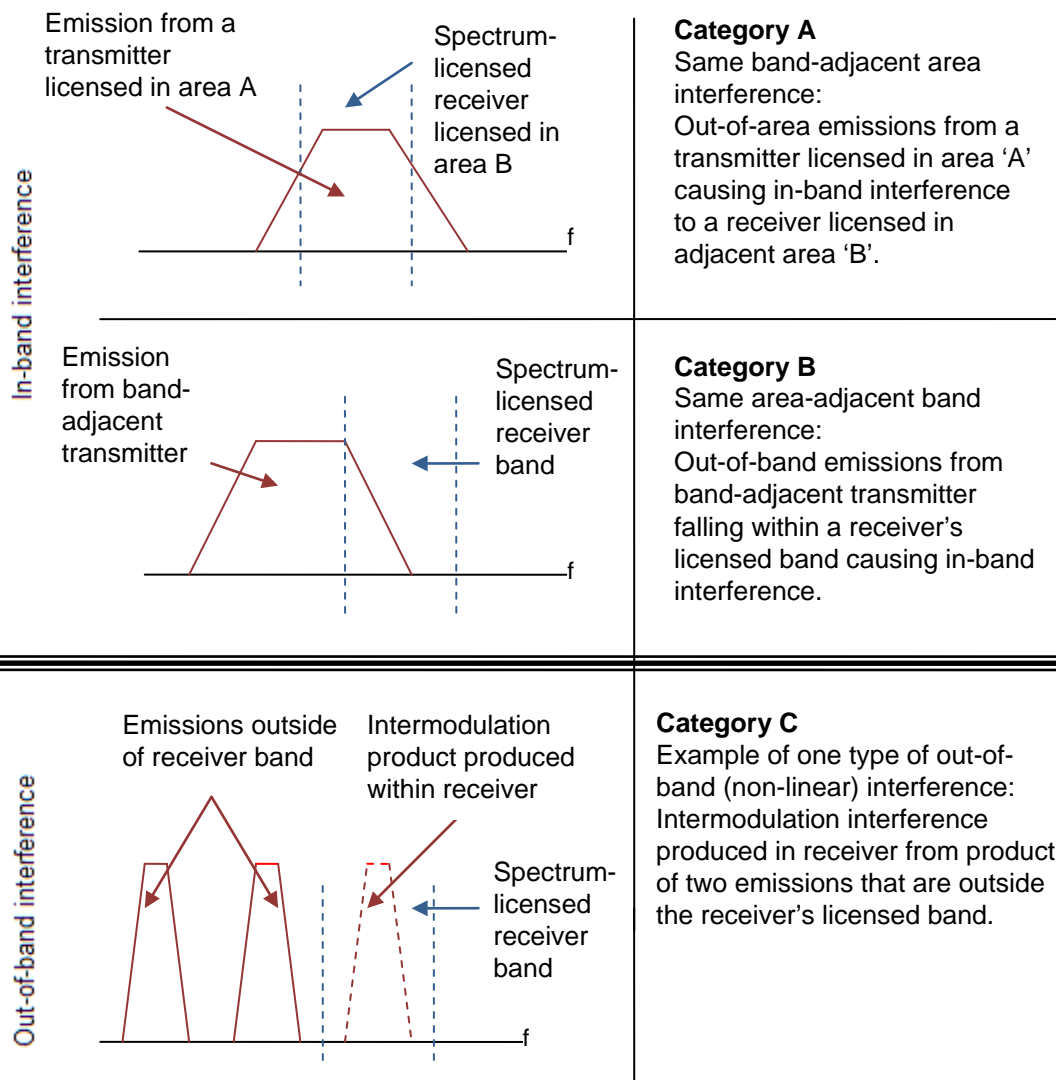
Each spectrum-licensed band may have more than one guideline. Typically, as a minimum, one guideline will contain information for spectrum licensees about managing interference from apparatus, class and spectrum-licensed services. Another guideline will contain information for spectrum licensees about protection to be provided to non-spectrum-licensed receivers.

There are two categories of interference that need to be managed to ensure the effective and efficient use of spectrum—in-band and out-of-band interference (see Figure 2):

- > **In-band interference** means those levels of emissions within the frequency band in which the operation of a radiocommunications receiver is authorised. The two sub-categories for in-band interference with respect to spectrum licensing are:
 - > interference caused by emissions from a radiocommunications transmitter operating under a licence in the same frequency band but adjacent geographic area as the radiocommunications receiver, otherwise known as *outside-the-area* or co-channel emissions
 - > interference caused by emissions from a radiocommunications transmitter licensed to operate in frequencies adjacent to the radiocommunications receiver but within the same geographical area as the receiver, otherwise known as *out-of-band emissions*.³
- > **Out-of-band interference** is those emissions at frequencies outside the frequency band in which the operation of a radiocommunications receiver is authorised. The magnitude of this type of interference is dependent on the non-linear properties of the receiver and the distance between the transmitter and receiver.

³ In some rare cases, it may be possible to also have this type of interference caused by emissions from a transmitter operating under a frequency adjacent licence and located in an adjacent area.

Figure 2 Interference scenarios managed by technical frameworks



MORE INFORMATION

Radiocommunications advisory guidelines

- > see section 262 of the [Radiocommunications Act](#)
- > see a list of [radiocommunications advisory guidelines](#) on the ACMA website and the consolidated versions of those instruments on www.comlaw.gov.au
- > see [interference resolution](#) on the ACMA website.

4 Registration of devices

This section provides information on ACMA regulatory and administrative arrangements that assist spectrum licensees to coordinate with other spectrum users and manage interference between services. Spectrum licensees are required to register radiocommunications transmitters with the ACMA before their operation, except where those transmitters are exempt from registration (as defined on the licence). Registration details assist licensees to meet their requirement to coordinate with other users to manage interference and to protect specified services.

4.1 Registration of radiocommunications devices

Section 69 of the Radiocommunications Act requires the ACMA to include a condition on all spectrum licences that radiocommunications transmitters must not be operated under the licence unless the relevant requirements under Part 3.5 of the Act for registration of transmitters are met.

The ACMA recommends that radiocommunications transmitters are registered at the system design stage. This will enable other licensees to re-check the coordination and, if an error is detected, negotiate directly with the spectrum licensee to avoid further costs associated with transmitters that cannot be operated due to interference.

Once details of a transmitter have been registered, the licensee (or person authorised by the licensee) will need to comply with those details in operating the device until such time as the registration is varied. Operation of a device will not be authorised under a licence if it is operated in a manner that is not in accordance with the details in the [Register of radiocommunications licences](#) (RRL).

4.1.1 Register of radiocommunications licences

Details of current licences in each of the spectrum-licensed bands are available in the RRL. The RRL is a public reference source published on the ACMA website containing information about spectrum and apparatus licences issued under the Radiocommunications Act, and the transmitters (and some receivers) that operate under spectrum licences. The ACMA updates the details about spectrum licences and device registrations in the RRL when a spectrum licence is issued, varied, suspended, cancelled or surrendered, or if the licence or part of the licence is assigned to another person, or resumed by the ACMA.

4.1.2 Determining acceptable levels of interference

As discussed in Chapter 2, technical frameworks specify the maximum levels of emission that may legitimately cross the geographic and frequency boundaries of spectrum licences from points within other spectrum-licensed space. Accordingly, when considering what services might be established within the geographic areas of a licence, spectrum licensees should consult the RRL to check for transmitters that may be located within other spectrum-licensed areas and consider that they may radiate power into the spectrum licensee's licence area. For emissions across the area boundary (due to other spectrum-licensed transmitters operating in same band and adjacent area), the level of radiated power may be either:

- > at any level up to that allowed under the relevant determination of unacceptable interference made by the ACMA under subsection 145(4) of the Radiocommunications Act
- > at any level up to that otherwise negotiated with the relevant spectrum licensees.

4.1.3 Registration requirements for spectrum licensees

Spectrum licensees are required to register the radiocommunications transmitters they intend to operate under their licences in the RRL, unless the transmitter type is specifically exempted from registration under their licence. Licensees must not operate transmitters unless they are registered or exempt from registration. It is a condition of spectrum licences that registered devices must be operated in a manner that is consistent with the details in the RRL. To recover its costs, the ACMA charges a fee for device registrations. The applicable charges are specified in the [Radiocommunications \(Charges\) Determination 2007](#).

Where licences are reissued or reallocated to the same licensee following the expiry of the original licence, all devices under the new licence must be re-registered.

The ACMA provides online device registration for accredited persons, although the process may also be conducted manually. This enables accredited persons to apply online to register transmitters on behalf of licensees. After receiving an application for registration, the ACMA will register the device and confirm registration.

4.1.4 Interference impact certificates

In order to register a transmitter intended for operation under a spectrum licence on the RRL, the ACMA requires an interference impact certificate (IIC) to be issued by an accredited person.

The [Radiocommunications \(section 145\(3\) Certificates\) Determination 2000](#) sets out the conditions that apply to accredited persons when issuing an IIC. The conditions require that the accredited person is satisfied that one of the following is met:

- > the operation of the device will not cause an unacceptable level of interference, as set out in the relevant section 145 determination
- > sufficient internal guard space has been allocated to mitigate potential interference from the transmitter
- > all licensees who, in the opinion of the accredited person, may be affected by the interference have given consent in writing to interference from the transmitter.

By issuing an IIC, an accredited person is certifying that the levels of emission radiated from a transmitter operating at a particular site, on a given carrier frequency and within specific technical parameters are consistent with the spectrum licence under which it operates and are contained in a manner that is in accordance with the technical framework.

Guidance on the registrations of radiocommunications devices under the guard space and agreement certification options is provided in the information paper [Registration of radiocommunications devices under spectrum licences](#).

Spectrum licence conditions require that each transmitter must also be labelled with its registration number. There are some exemptions to this rule for devices that have low interference potential, such as low-power mobile transmitters.

Under their licence conditions, licensees are required to ensure that radiocommunications transmitters are not operated unless the transmitter complies with the details about it in the RRL. Licensees should advise the ACMA, through an accredited person, of changes to devices operating in their licensed spectrum so that the RRL can be updated. Accuracy of information contained on the RRL supports licensee management of interference. Although not mandatory, the registration of receivers is also advised, since one of the matters the ACMA will take into account in settling interference disputes is the time of registration of the receiver involved in the interference (however, see also section 4.2.2).

4.1.5 Registration for groups of transmitters and receivers

The ACMA allows group registrations of transmitters and receivers in specified circumstances. If two or more transmitters are operated for the purpose of communicating with the same receiver or same group of receivers, and they have identical emission characteristics, then they may be treated as a group in order to simplify the registration process.

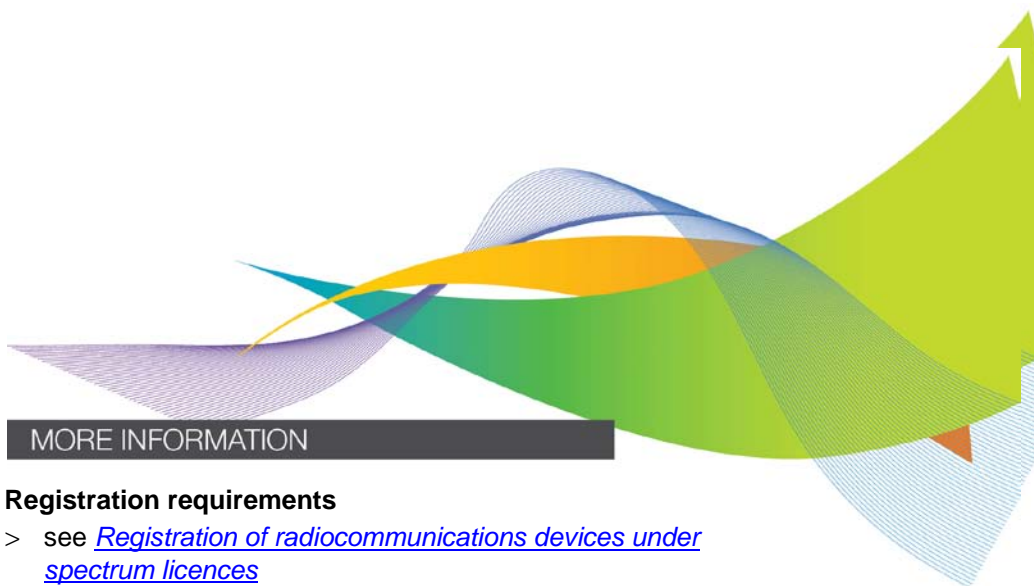
4.1.6 Core conditions agreements

A core conditions agreement is an agreement between spectrum licensees to allow for the registration of devices even though the emissions from those devices exceed the relevant core licence conditions. Agreements cannot be used to authorise the operation of devices:

- > located outside the geographic area of the licences under which the agreement is reached or with a centre frequency outside the frequency range of the licence
- > with emissions limits outside a designated spectrum-licensed band greater than the limit specified in the spectrum licence
- > with an outside-the-area emission limit greater than the maximum specified in the spectrum licence.

Guidance on the registration of radiocommunications devices via core condition agreements is provided in the [Registration of radiocommunications devices under spectrum licences](#).

Agreements between licensees can only continue to apply while the licence status for the bandwidth and area of the spectrum space covered by the agreement remain unchanged. Where trading of licences takes place and new boundaries are formed, these agreements must be renegotiated by the new licensees. When trading occurs and post-trade agreements are not in place, devices that remain in operation as part of the trade must be re-registered and meet the requirements of the new licence within the changed spectrum space.



MORE INFORMATION

Registration requirements

- > see [Registration of radiocommunications devices under spectrum licences](#)
- > see section 69 and Part 3.5 of the [Radiocommunications Act](#)
- > see the [RRL](#)
- > see section 145 [determinations](#)
- > see [Radiocommunications \(section 145\(3\) Certificates\) Determination 2000](#)
- > see [Radiocommunications \(Labelling\) Determination 1997](#).

4.2 Coordination with other spectrum users

4.2.1 Existing radiocommunications services

Spectrum licensees may need to liaise with the owners of existing and future radiocommunications services deployed in adjacent spectrum. The ACMA recommends that prospective licensees inform themselves of existing spectrum and apparatus licences adjacent to spectrum space prior to obtaining access to the spectrum.

Information about current spectrum licences and registered devices is contained in the RRL (see section 4.1). The ACMA also publishes spectrum planning papers, particularly the [Five-year spectrum outlook](#), which provides an indication of future trends in spectrum allocations.

4.2.2 Interference that the technical framework does not prevent

While the technical framework is designed around certain levels of acceptable interference probability, interference can still occur in the field once a device is deployed. Interference may be caused by emissions at frequencies either inside or outside the spectrum space of a licensee.

Before considering an interference complaint, licensees are strongly advised to attempt to locate the source of any interference by checking the RRL. An investigation may indicate the likely cause of the interference and it may be possible to settle the problem without the ACMA's intervention. If the ACMA becomes involved in resolving a dispute, licensees may be charged for any work undertaken. The applicable charges are specified in the [Radiocommunications \(Charges\) Determination 2007](#).

4.2.3 Defence use of the spectrum

The Australian Defence Force and the Department of Defence use a significant portion of the radiofrequency spectrum. All spectrum users may, from time to time, have to share use of the spectrum with agencies engaged in the defence of Australia and national security activities. In some circumstances, Defence use of spectrum is not subject to the operation of the Radiocommunications Act.

4.2.4 Coexistence of spectrum licences with class licences or apparatus licences

Subsection 138(2) provides that the ACMA may issue a class licence permitting the operation of radiocommunications devices within spectrum space that is designated or declared for spectrum licensing. That is, a class licence may be issued in spectrum-licensed space where the ACMA is satisfied that:

- > unacceptable levels of interference will not occur to the operation of radiocommunications devices operated, or likely to be operated, under spectrum licences
- > it is in the public interest to issue the class licence.

Before issuing the class licence, the ACMA must consult with all potentially affected spectrum licensees.

The ACMA may issue an apparatus licence in spectrum space that is designated for spectrum licensing either:

- > where it is satisfied that the special circumstances of the particular case justify the issuing of the licence
- > to a law enforcement agency, as defined in the Radiocommunications Act, for the purpose of investigations or operations of the agency.

4.2.5 Protection of the Mid-west radio quiet zone

The ACMA established Australia's first radio quiet zone (RQZ) in 2005, to preserve the low level of radiofrequency noise at a site in remote Western Australia (near Boolardy Station, around 200 kilometres east of Meekatharra). This area is known as the Mid-west RQZ and is intended to facilitate the development and use of radioastronomy technologies at the Murchison Radioastronomy Observatory (MRO).

Restrictions apply to the issue of licences up to 260 kilometres from the MRO. Licence conditions will be applied to adjacent licensees to prevent harmful interference being caused to radioastronomy services.

Before seeking to register a radiocommunications transmitter for use in or around the RQZ, licensees should follow the procedures set out in Radiocommunications Assignment and Licensing Instruction (RALI) MS 32 ([RALI MS 32](#)), as in force from time to time.

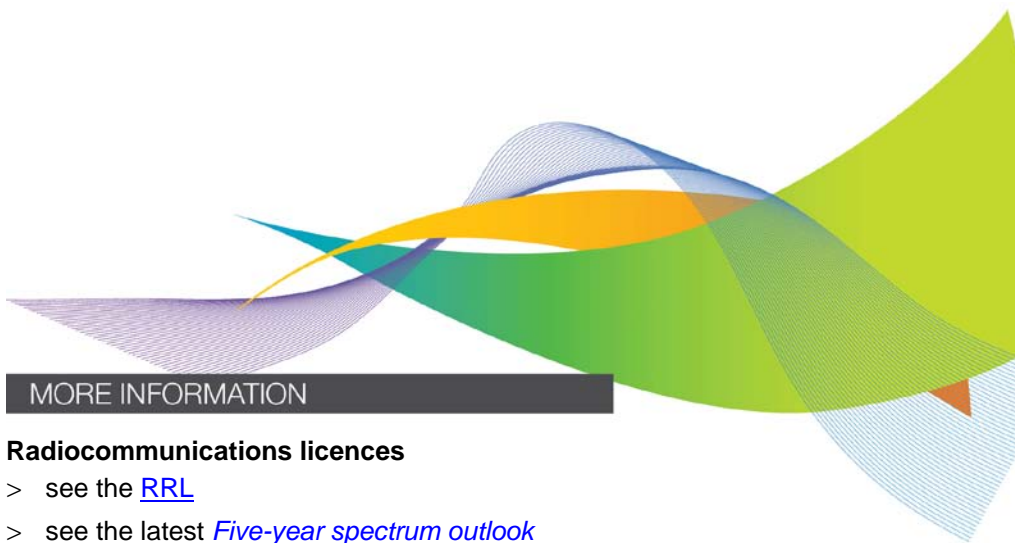
While RALI MS 32 applies directly to apparatus-licensed devices, the methods and procedures it contains are also applied to spectrum licences through a licence condition.

4.2.6 International coordination

The International Telecommunication Union (ITU) [Radio Regulations](#) are a set of international rules that Australia is required to comply with as a signatory to the ITU Convention. Transmitters operated under a spectrum licence, other than in accordance with the ITU Radio Regulations, must not cause interference to any services of any other country (for example, Papua New Guinea or Indonesia) that are operating in accordance with ITU Radio Regulations. A requirement of spectrum licences is that the licensee must ensure that if operation of a transmitter causes harmful interference to overseas services operating in accordance with ITU Radio Regulations, the transmission must cease.

Spectrum licensees must also accept interference from any overseas service operating in accordance with ITU regulations. Potential spectrum licensees should note that the ACMA will impose such additional licence conditions on spectrum licences as may be necessary to meet its international obligations.

The ITU Regulations can be accessed through the [ACMA website](#).



MORE INFORMATION

Radiocommunications licences

- > see the [RRL](#)
- > see the latest [Five-year spectrum outlook](#)
- > contact the ACMA's Radiocommunications Licensing and Telecommunications Deployment Section on 1300 850 115 or email LAIS@acma.gov.au.

Defence use of the spectrum

- > see Division 4 of Part 1.4 of the Radiocommunications Act
- > see Australian footnotes AUS1 and AUS11 in the [Australian Radiofrequency Spectrum Plan](#).

Coexistence of spectrum licences with class licences or apparatus licences

- > see sections 138, 105 and 153P(2) of the [Radiocommunications Act](#).

The RQZ

- > see [Radiocommunications \(Mid-West Radio Quiet Zone\) Frequency Band Plan 2011](#)
- > see RALI MS 32, [Coordination of Apparatus Licences within the Mid-West Radio Quiet Zone](#).

5 Spectrum trading and authorisations

This section explains how the ACMA's spectrum licensing arrangements permit licence-holders to trade part or all of the spectrum space covered by their licence and to allow third parties to use the licensed spectrum by negotiation. This flexibility encourages efficient use of spectrum.

Division 5 of Part 3.2 of the Radiocommunications Act provides the legislative framework for trading of spectrum licences. Spectrum licence trades and third-party authorisations are private commercial agreements, which are considered to be an acquisition by a person of an asset of another person, for the purposes of section 50 of the [Competition and Consumer Act 2010](#). They are subject to that Act's prohibition of acquisitions that would result in a substantial lessening of competition, which is enforced by the Australian Competition and Consumer Commission.

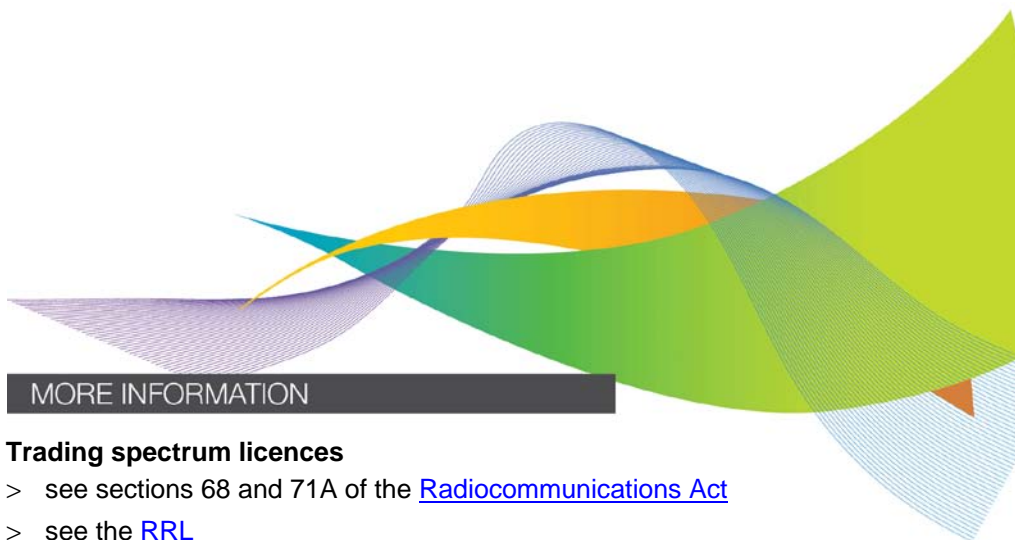
5.1 Spectrum trading

Spectrum licences are regarded as financial assets due to their defined spectrum space and long licence period (up to 15 years). Spectrum licensees are permitted to negotiate the purchase of additional spectrum space to cover larger areas and/or more bandwidth. Subject to rules determined by the ACMA, licensees may also subdivide their licences and sell parts of licences. To support spectrum trading, the ACMA makes contact details of spectrum licensees available through the RRL.

As specified in the [trading rules determination](#) made by the ACMA, spectrum licences may be traded in whole or in part, but they may not be traded in parcels smaller than a standard trading unit (STU).

The frequency component of an STU is 1 Hz, while the geographic component is defined as a single cell of the ASMG. Cells in the ASMG are mapped consistently in five-minute (5') increments, by longitude and latitude. In addition, a minimum contiguous bandwidth (MCB) is set for each band in the trading rules determination, which limits the contiguous bandwidth that can generally be licensed (as opposed to traded), reducing the potential for fragmentation.

Once a commercial agreement is reached on a particular trade, the transaction must be notified to the ACMA. The trade becomes effective only after the new licence details appear in the RRL.



MORE INFORMATION

Trading spectrum licences

- > see sections 68 and 71A of the [Radiocommunications Act](#)
- > see the [RRL](#)
- > see the [Radiocommunications \(Trading Rules for Spectrum Licences\) Determination 1998](#)
- > see [acquiring spectrum](#) on the ACMA website
- > contact the ACMA's Radiocommunications Licensing and Telecommunications Deployment Section on 1300 850 115 or email LAIS@acma.gov.au.

5.2 Third-party authorisations

The Radiocommunications Act specifies that spectrum licences authorise the operation of radiocommunications devices under spectrum licences only by the spectrum licensee and third parties authorised under section 68 of the Act. Spectrum licensees may authorise third parties to use the licensed spectrum by negotiation of a private agreement that allows a 'third-party user' to operate a radiocommunications device under the licensee's licence.

A licensee does not have to seek the ACMA's approval before granting a third-party authorisation, nor does either party have to register the third-party agreement with the ACMA. However, the ACMA invites licensees to help its information-gathering process by completing and submitting its [third-party authorisation details form](#).

A licensee who authorises a third party to operate devices under a spectrum licence must:

- > inform the third party user of:
 - > their obligations under the Radiocommunications Act
 - > the conditions of the licence
 - > the registration requirements for devices operating under the licence
 - > any rules made by the ACMA relating to third party authorisation
- > take ultimate responsibility for ensuring that all operations of these devices comply with the conditions of the licence.

Any contravention by either the licensee or the third-party user of a licence condition; the Radiocommunications Act; or any other Commonwealth, state or territory law may result in suspension or cancellation of the licence.



MORE INFORMATION

Third-party authorisations

- > see [third-party authorisation](#) on the ACMA website
- > see sections 64 and 68A of the [Radiocommunications Act](#)
- > email Spectrum Outlook and Review Section at spectrum.outlook@acma.gov.au.

6 Other considerations

This section explains some additional regulatory arrangements relevant to spectrum licensees, including electromagnetic emissions guidelines and the role of accredited persons.

6.1 Radiocommunications devices and emissions

Certain aspects of the operation of radiocommunications devices, such as the antenna location, height and construction, may be regulated by state, territory or local government legislation. Before planning to operate a device in a certain location, licensees should investigate the local rules for the erection of towers and antennas.

Every spectrum licensee will need to take into account occupational health and safety requirements for radiocommunications devices. Such requirements are the responsibility of the relevant state or territory government.

In addition, licensees will be required to comply with any health exposure standards that the ACMA may make for the health and safety of people who operate, work on or use radiocommunications transmitters and receivers. The ACMA issues spectrum licences subject to conditions, including electromagnetic radiation requirements, for certain transmitters.

The ACMA currently issues spectrum licences subject to the [Radiocommunications Licence Condition \(Apparatus Licence\) Determination](#). For this condition, the reference to transmitter licence in the definition of 'licence' in subsection 4(1) of the determination should be read as a reference to spectrum licence.

The supply of customer equipment connected to a service supplied using spectrum-licensed space may be subject to ACMA technical standards, labelling and record-keeping requirements. Hand-held and portable equipment (with an integral antenna) will need to comply with the Australian Radiation Protection and Nuclear Safety Agency ([ARPANSA](#)) electromagnetic energy (EME) exposure limits mandated by the ACMA. The operation of equipment used under spectrum licence (including end user equipment operated via third-party authorisation) is subject to the ARPANSA exposure limits as a condition on a spectrum licence.

If the equipment has functionality independent of radio transmission (for example, a smartphone that can operate with the transmission function disabled), it must meet electromagnetic compatibility (EMC) technical standards and associated labelling and record-keeping requirements prior to being supplied to the market.

The supply of the end user device may also be subject to customer equipment technical standards, labelling and record-keeping requirements, depending on the interface technology used. Currently, equipment used in connection with a public mobile telecommunications service is subject to the [Communications Alliance](#) industry code [AS/CA S042.1](#) (with specific requirements for CDMA, GSM and 3G technologies). Where there is no technical standard that applies directly to the technology interface for the equipment, it will be subject to the ACMA technical standard [AS/NZS 60950.1: 2011](#).

A licensee who wishes to operate a non-standard device under a spectrum licence must seek permission from the ACMA. These permits may be issued by the ACMA under section 167 of the Radiocommunications Act and will only be issued during the term of the licence. Permission to supply non-standard devices for operation under a spectrum licence may also be given by the ACMA under section 174 of the Radiocommunications Act.



MORE INFORMATION

Radiocommunications devices and emissions

- > see [EME requirements & technical standards for transmitters](#) on the ACMA website
- > see [Telecommunications Technical Standard \(Information Technology Equipment — Safety, Part 1: General Requirements — AS/NZS 60950.1:2011\) 2011](#)
- > see [AS/CA S042.1:2010 Requirements for connection to an air interface of a Telecommunications Network](#)
- > see [Radiocommunications Licence Conditions \(Apparatus Licence\) Determination 2003](#)
- > see [Radiocommunications \(Electromagnetic Radiation—Human Exposure\) Standard 2003](#)
- > see [Radiocommunications \(Compliance Labelling—Electromagnetic Radiation\) Notice 2003.](#)

6.2 Accredited persons

An accredited person is someone whom the ACMA has accredited to perform engineering work for radiocommunications licensing. Such activities include frequency coordination and emission level management. Only an accredited person can issue the interference impact certificate or other certification that may be required before a transmitter can be registered for operation under a spectrum licence.

The ACMA currently accredits persons to issue two kinds of certificates:

- > frequency assignment certificates under subsection 100(4A) of the Radiocommunications Act, relating to the operation of radiocommunications transmitters and receivers covered under apparatus licensing arrangements
- > interference impact certificates (IIC) under section 145(3) of the Radiocommunications Act, relating to the operation of radiocommunications transmitters in spectrum subject to spectrum licensing.

Anyone with the appropriate qualifications and experience can apply to the ACMA for accreditation. The ACMA provides [contact details for accredited persons](#) on its website.

Glossary

ACMA	Australian Communications and Media Authority
accredited person	An individual accredited by the ACMA to perform engineering work for radiocommunications licensing (see section 6.2)
AGD 66	Australian Geodetic Datum of Australia 1966 issued by Geoscience Australia
apparatus licence	an apparatus licence issued under Part 3.3 of the Radiocommunications Act
ASMG	Australian spectrum map grid 2012 (see section 1.2.2)
class licence	a class licence issued under Part 3.4 of the Radiocommunications Act
core condition	a condition included in a spectrum licence under section 66 of the Radiocommunications Act
core conditions agreement	an agreement between spectrum licensees to permit the registration of devices whose emissions exceed the core conditions of a spectrum licence
FDD	frequency-division duplex
frequency band	any contiguous range of radio frequencies
GDA 94	Geocentric Datum of Australia 1994 issued by Geoscience Australia
IIC	interference impact certificate (see section 4.1.4)
ITU	International Telecommunication Union
ITU Radio Regulations	a document, in four volumes, that contains articles, appendices, resolutions and recommendations of the ITU relating to international radiocommunications coordination
ITU Convention	Constitution and Convention of the International Telecommunication Union, to which Australia became a signatory in 1922
licence	a spectrum licence, an apparatus licence or a class licence issued under the Radiocommunications Act
licensee	in relation to a spectrum licence, the person specified in the licence as the licensee, whether the licence was originally issued to that person or subsequently assigned to him or her
MCB	minimum contiguous bandwidth (see section 5.1)
mid-west radio quiet zone	a site in remote Western Australia, at which restrictions are placed on use of radiocommunications transmitters in order to preserve the low level of radiofrequency noise and thereby protect radioastronomy activities (see section 4.2.5)
radiocommunications advisory guidelines	guidelines made under section 262 of the Radiocommunications Act that provide assistance and advice for coordinating with stations or other services as required
Radiocommunications Act	<i>Radiocommunications Act 1992</i> of the Commonwealth
RALI	Radiocommunications Assignment and Licensing Instruction
RQZ	radio quiet zone
RRL	register of radiocommunications licences (see section 4.1)
spectrum licence	a spectrum licence issued under Part 3.2 of the Radiocommunications Act
STU	standard trading unit (see section 5.1)
technical framework	specifies the technical requirements for operating devices under a spectrum licence, for the purpose of managing interference between users (see Chapter 2)
third-party authorisation	a private agreement that allows a spectrum or apparatus licensee to authorise another person or organisation (known as a third-party user) to operate a radiocommunications device under the licensee's licence (see section 5.2)

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