REGULATION IMPACT STATEMENT

INSTRUMENTS RELATING TO THE ALLOCATION OF THE 27 GHz BAND OF THE RADIOFREQUENCY SPECTRUM BY ISSUING SPECTRUM LICENCES

Introduction

This regulation impact statement (RIS) relates to the following instruments, which support the framework for allocating the 27 GHz (26.5 – 27.5 GHz) band of the radiofrequency spectrum by issuing spectrum licences:

1. Radiocommunications (Spectrum Licence Allocation—27 GHz Band) Determination 2000 (made under section 60 of the Radiocommunications Act 1992 (the Act)).

This determination sets out the procedures to be followed by the ACA in allocating spectrum licences, using a simultaneous multiple round auction, in the 27 GHz band.


This plan sets out the procedures to be followed by the ACA for issuing spectrum licences in the 27 GHz band. It identifies the spectrum to be allocated, the allocation method to be used, and the conditions applying to the spectrum licences.


This determination sets out the registration requirements for devices intended to operate in the 27 GHz band by determining what are unacceptable levels of interference. Devices that do not meet the requirements will not be authorised to operate.


These advisory guidelines have been made for the management and settlement of interference to receivers operating otherwise than under spectrum licences in the 27 GHz band, caused by spectrum licences transmitters.

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1 A spectrum licence authorises a person to operate any radiocommunications device within a specified block of spectrum, subject to the conditions specified on the licence. This is in contrast to an apparatus licence which authorises the operation of a device or devices of a specified kind (usually described in terms of the purpose of operation).

These guidelines provide for the management and settlement of interference to receivers operating under spectrum licences in the 27 GHz band and caused by non-spectrum-licensed transmitters.


These guidelines provide for the management and settlement of interference between services licensed to operate in the 27 GHz and 28 GHz bands.

Background

It is Government policy to promote greater competition in the provision of communications services, consistent with the deregulated telecommunications environment that was introduced on 1 July 1997. This policy, among other things, involves making additional spectrum available for new telecommunications services. The Australian Communications Authority (ACA) is responsible for issuing licences to persons to use the spectrum for radiocommunications and telecommunications purposes.

The 26.5 GHz to 27.5 GHz band (the “27 GHz band”) of the radiofrequency spectrum has been identified as suitable for broadband wireless access (BWA) services, such as pay television, Internet access, telemedicine, wireless local loop telephony, high-speed data services and video teleconferencing.

Following a process of public consultation during 1999-2000, the ACA, on 19 April 2000, recommended to the Minister that he give the ACA a notice under section 36 of the Act designating the 27 GHz band to be allocated across the whole of Australia by issuing spectrum licences.

In response to the ACA’s recommendation, the Minister on 31 May 2000 gave the above notice. The notice did not contain any instructions as to how the spectrum was to be allocated; that is by auction, tender or sale at a pre-determined or negotiated price. The spectrum is currently unoccupied.

1. Problem/Issue

Under section 39 of the Act, the ACA on receiving a notice under section 36 of the Act designating a part of the spectrum to be allocated by issuing spectrum licences must prepare a marketing plan for issuing such spectrum licences. This means that, as a result of the Minister giving a section 36 notice to the ACA for the 27 GHz band, the ACA is required to prepare a marketing plan for issuing spectrum licences relating to this band.
Under section 60 of the Act, the ACA must determine, in writing, the procedures to be applied in allocating spectrum licences for the 27 GHz band:

(a) by auction; or
(b) by tender; or
(c) by allocation for a pre-determined price or a negotiated price.

A framework to manage interference is also a necessary part of any radiocommunications system. For spectrum licensing, this is achieved through registration requirements for devices, licence conditions, and operational guidelines.

2. Objectives

In developing a Spectrum Marketing Plan for the 27 GHz Band, the ACA seeks to:

a) allocate spectrum efficiently;

b) maximise competition in the provision of communications services, where possible allowing the market to determine the providers of these communications services and what technology should be used to deliver them;

c) meet the reasonable needs of persons wanting to use the 27 GHz band; and

d) minimise administrative and compliance costs.

3. Options

Under section 39 of the Act, the ACA must develop a spectrum marketing plan. The plan may indicate procedures for issuing spectrum licences; how the spectrum is to be apportioned among the spectrum licences; and the conditions that may be included in the licences. Section 60 requires the ACA to determine how licences are to be allocated (auction, tender, pre-determined or negotiated price) and what allocation limits should apply.

The ACA considered auction and tender options for the allocation of spectrum; a prescriptive framework or a 'light touch' approach to the management of interference; and the size and geographical areas of spectrum issue.

While the ACA invited comments from interested parties on each of these broad matters, allocation limits are determined by the Minister for Communications, Information Technology and the Arts following advice from the Department of Communications, Information Technology and the Arts (DCITA) and the Australian Consumer and Competition Commission (ACCC).
4. **Impact Analysis**

**Stakeholders**

The main groups affected by the proposed regulation are:

i. the Australian public, whose interests are represented by the Government, insofar as they have an interest in the 27 GHz band being allocated in a way that promotes competition and ensures a fair return to the Commonwealth for the private use of a public resource;

ii. potential users of the 27 GHz Band: in this case the telecommunications industry including:
   a. existing and prospective operators of broadband wireless access type services; and
   b. equipment manufacturers, insofar as the proposed allocation of 27 GHz band would facilitate the introduction of new technology; and

iii. consumers of services provided over the 27 GHz Band.

**How licences are to be allocated**

In determining how licences are to be allocated the ACA has considered sale by auction (either ‘English’ or ‘simultaneous’), sale by tender, and sale at pre-determined or negotiated price.

Demand for spectrum licences is expected to exceed supply. This outcome favours allocation by tender or auction. Of these two, the ACA prefers auction.

The benefits of conducting an auction to allocate spectrum licences are that it would be a quick and open process, it would establish a proper market value for the licences (i.e. without bidders paying too much or too little), and it would ensure that the licences were allocated to the people who valued them most highly.

The disadvantage of an auction over a tender is that bidders have more opportunity to collude during an auction where the identity of the other bidders is known.

Where a large number of complementary and substitutable lots are on offer, the ACA prefers to conduct a simultaneous auction, rather than a conventional ‘English’ (‘open outcry’) auction. This type of auction offers far more scope for industry to acquire the combinations of spectrum they need to implement successful business plans. This is an important consideration in the 27 GHz band spectrum allocation where licences are to be offered in different areas and in different bandwidths.

Although a simultaneous auction is relatively complex compared to tenders or open out cry auctions, prospective applicants would be familiar with the simultaneous auction format as a result of the ACA undertaking such auctions for the 500 MHz, 800 MHz, 1.8 GHz, 28 GHz and 31 GHz bands.
Managing interference (Technical framework)

A framework to manage interference is a necessary part of any radiocommunications system. For spectrum licensing, this is achieved through compulsory registration of devices, licence conditions, and operational guidelines.

Under section 66 of the Act, a spectrum licence must contain core conditions specifying the parts of the spectrum in which operation of radiocommunications devices is authorised, permitted levels of radio emissions, the geographic area of the licence, and the level of allowable emissions outside the area defined in the licence.

Under section 69 of the Act the ACA may determine the requirements that have to be met before a device can be registered. The ACA has determined that emission limits should be imposed by way of determinations under subsection 145(4) of the Act (and licence conditions).

The determinations set out unacceptable levels of interference for radiocommunications transmitters proposed to be operated under spectrum licences. The practical benefits of device registration are that significant levels of emission are kept within the space of a spectrum licence, and that licensees are able to access a national centralised database to facilitate the co-ordination of their devices.

Announcing the technical framework before the auction allows bidders to estimate the utility and hence value of the spectrum independent of any utility that may be achieved through negotiation with adjacent licensees after the auction. The regulations and licence conditions both facilitate technology neutrality and consequently do not favour any particular technology.

While a section 145 Determination may appear complex, its content may be readily implemented in software. A cost to licensees is that they will be required to undertake certain work which was formerly undertaken by the ACA. However this cost will be substantially reduced with the introduction of an on-line registration process.

The ACA has proposed that certain requirements concerning the 27 GHz band spectrum licences (for example, responsibility for interference management) should be imposed as licence conditions determined by the ACA under section 71 of the Act. The benefits are that this minimises Government intervention in the day to day activities of spectrum licensees. The cost is that this places additional responsibility on the licensees themselves. If licensees do not abide by their licence conditions, it will then be open to anyone to seek a remedy, first through the ACA’s interference settlement procedures and then through the courts.

The ACA has proposed that advisory measures, imposed by way of guidelines under section 262 of the Act, are more suitable than regulations for the purpose of minimising mutual interference between devices operating under spectrum licences and devices operating under non-spectrum licences.

The advisory guidelines specify a compatibility requirement for each type of receiver operated under an apparatus licence and a notional receiver operated under a spectrum licence. The compatibility requirement is a ‘bottom-line’ operational requirement for these receivers. Licensees must achieve this requirement, unless they negotiate some other requirement, in the most efficient manner possible.

The benefit of this is that industry will design more efficient co-ordination procedures (than Government can) that will significantly increase the utility of their spectrum. The advisory
approach is designed to provide maximum flexibility for both spectrum and apparatus licensees in the arrangement of their affairs so as to avoid interference between their radiocommunications services.

The benefit of this ‘light touch’ approach is that licensees may be able to negotiate more flexible arrangements than if they were set down in regulation. The cost is that it puts the onus on licensees to design co-ordination procedures, a function usually performed by government.

**Marketing considerations (Marketing Plan)**

In developing a marketing plan for the 27 GHz band spectrum, an issue of central importance is the size and nature of allocatable lots to be specified in the plan, in terms of their bandwidths and areas.

*Lot Bandwidths*

In considering the bandwidth of lots, the ACA considered both the practical limits of likely technologies, and the need to provide flexibility so that different technologies could be accommodated. The ACA’s preference is to subdivide the designated spectrum in such a way as to allow maximum flexibility for potential operators to deploy their systems and to allow the market to decide on the preferred bundling.

The ACA received representations that the spectrum should be auctioned to allow the acquisition of blocks that align exactly with allocations in other countries (26.85-27.35 GHz, for example) in order to facilitate the speedy deployment of particular equipment. The ACA also heard argument that most if not all equipment designed for BWA systems in the 27 GHz band can be deployed anywhere in the band subject to some modification. Whilst the ACA seeks to avoid placing unnecessary obstacles in the way of prospective operators, the ACA’s view is that *prima facie* it would be unfair to allocate spectrum in such a way as to give preference to a particular equipment supplier or suppliers. The ACA is also concerned that this would be inconsistent with the principle of technology neutrality that it has followed in relation to spectrum licensing.

The ACA therefore proposes to auction six unpaired lots in each area in such a way as to allow for a number of different preferred outcomes, as shown in Figure 1.

**Figure 1. Division of band into lots for allocation**

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The ACA believes that the above packaging represents the best compromise between minimising the complexity of the technical framework for interference management, maximising the utility and flexibility afforded to licensees, giving opportunities for more operators in the market and the alignment with available equipment.
Lot Areas

The ACA proposes that licences be allocated to take account of:

- population distribution;
- the propagation characteristics of the band; and
- the ability of natural terrain to shield radiocommunications in one population centre from another.

The ACA has also taken into account the licence areas that were allocated in the auction of 28/31 GHz spectrum in February 1999. These were 29 metropolitan and regional areas covering the whole of Australia.

Most comments to the ACA on this issue indicated support for an approach similar to the 28/31 GHz allocation, whilst others suggested that the large ‘Remote Australia’ market could be amalgamated with some of the less populated regional markets. In light of these comments, the ACA will offer lots in 21 market areas (a reduction from the 29 areas offered for the 28/31 GHz auction), with some lots being an amalgamation of regional areas. A map showing the areas that the ACA will offer is at Appendix 2.

The benefits of these lots are that the metropolitan and regional lots would cater for Australia’s wide regional diversity and facilitate competition between service providers. This approach would allow for participation in the auction by groups known not to be interested in national coverage.

An auction that offers lots in regional areas may be slightly more complicated than one involving Australia wide lots. However, it would by no means by unduly complicated.

Licences will be issued for terms of 15 years, the maximum allowable under the Act: long terms are generally preferred because it provides the longest payback period for investment.

5. Consultation

Discussion papers

The ACA consulted extensively with the public on the allocation of further BWA spectrum following the auction of the 28 GHz band and the 31 GHz band.

On 28 January 1999, the ACA released a discussion paper seeking public comment on what parts of the radiofrequency spectrum might be made available for broadband wireless services. Comments on the discussion paper closed on 3 March 1999. In particular, comment was sought on:

- what, if any, radiofrequency bands above 20 GHz other than the 28 GHz and 31 GHz bands might, in order of preference, be made available for the provision of broadband wireless services (such as BWA) and over what area; and
- whether the bands should be allocated by way of apparatus licences or spectrum licences.
Comments were received from 13 parties.

On 7 December 1999, the ACA released a discussion paper inviting comments on the future broadband proposals based on the earlier discussion paper. There were 17 respondents; 2 parties had no comments on the proposals. Comments were sought on band for allocation, allocation method, competition limits and composition of lots, among other things.

Responses to that paper indicated that there was significant commercial interest in the band, and price-based allocation of licences was generally recognised to be an appropriate way of dealing with access to commercially desirable spectrum.

In the light of comments received on the contents of the above discussion papers, the ACA recommended to the Minister that he make the 27 GHz band available for spectrum licensing by giving a notice of designation under section 36 of the Act.

**Technical framework**

While the ACA was undertaking consultation on the allocation framework, it was also undertaking consultation on the technical framework for the licences, which forms the basis of the following four instruments:


Comments from earlier discussion papers were used in the development of these instruments. In addition, a list of equipment suppliers consulted in a targeted manner is at Appendix 1.

An important goal of the technical framework is to provide a level of technological neutrality, so that the band can be deployed in a number of different configurations to support a range of potentially competing technologies.

The ACA published on its website, and distributed by email and facsimile, a Directions Paper outlining the framework used to develop these instruments and invited comment from any interested persons.

There was little industry response to the technical framework, probably because interested industry members had participated in earlier development of the papers, and hence raised any concerns before publication of the Directions Paper.
Lot bandwidths

In the first two discussion papers, stakeholders generally supported the ACA’s initial proposal of a bandwidth of 2×250 MHz. The major concern at that stage was that competition limits should not restrict bidders to less than 500 MHz in total.

However, a number of respondents sought lots which could be aggregated to align with lots sold internationally, particularly the Canada “C” band, which is 26.85 GHz to 27.35 GHz. Accordingly, the ACA developed an option which allows aggregations to form a licence covering the frequencies of the Canada “C” band, or for large contiguous blocks of 500 MHz, or for paired 250 MHz blocks. There has been general support for this option.

Lot areas

Most respondents were unconcerned with the geographic options, although there was general support for areas based on those used in the 28/31 GHz auction.

Some respondents sought a break up of the “regional Australia” lot, while others called for fewer lots.

There was general support for the ACA’s final set of lots which, while based on the 28/31 GHz auction lots, had 8 fewer lots due to amalgamation of some lots.

Other comments

Respondents were supportive of the proposal to allocate the bands by issuing spectrum licences with 15 year licence terms.

A list of organisations consulted on the proposed allocation of the 27 GHz band is at Appendix 1.

6. Conclusion and Intended Action

Spectrum licence framework

The ACA’s preferred option is to allocate licences by way of a simultaneous multiple round auction.

In the light of comments received on the information package, the ACA also considers that the allocation framework for the 27 GHz band should provide for them to be made available in 21 geographic areas with bandwidths allowing a variety of aggregations. This will result in a total of 126 lots.

The ACA considers that its preferred technical framework, being technology neutral, is more in keeping with the Government’s objectives than regulation requiring a particular type of use. This framework also takes account of comments received in the course of the consultation.

Competition/bidding limits
The ACA understands this will be the subject of separate advice from the Department of Communications, Information Technology and the Arts. These issues will be explored in a separate Regulation Impact Statement (RIS), if any limits are to be imposed.

7. Implementation and review

The ACA intends to conduct the auction of the 27 GHz band in the second half of 2000. It will review the allocation framework (including supporting instruments) with a view to amending it if necessary to improve the efficiency of future auction processes in the same way as the rules for auction of the 27 GHz band were developed in the light of the ACA’s experience with earlier spectrum auctions.
Appendix 1

List of organisations consulted

List of respondents to the discussion paper entitled: Future allocation of radiofrequency spectrum suitable for broadband wireless services.

Queensland Police Service - R. N. McGibbon
Winstar Australia – Timothy Graham et al
Plessey Asia Pacific in conjunction with Wytec – Adrain Meredith
Cable and Wireless Optus – Susan Huggett
LMT Australia – Chris Macneil
AGL Electricity – Ryszard Orlowski
Newbridge Networks – Dennis Kan et al
CSIRO, Telecommunications and Industrial Physics - Richard Jacobsen
Telstra – Peter Darling
Nortel Networks – Graeme King
AAPT – Alasdair Grant
Vodafone – Clive Dale

List of respondents to the discussion paper entitled: Further Allocation of Radiofrequency Spectrum above 20 GHz for Broadband Wireless Services.

AAPT – David Havyatt
Agile Communications – Simon Hacket
Alcatel – Jeff Bond
Bureau of Met – Peter Gigliotti
CSIRO (Telecommunications and Industrial Physics) – Alan Young
CSIRO (Australia Telescope National Facility) – John Whiteoak
DOD – J. M. Hammer
Ericsson – Kim Dodemond
NEC – Weng Fong
Newbridge – Keith Doucet et al
Nortel – Graeme King
Optus – Susan Huggett
Siemens – Christopher Roberts
Telstra – Deena Shiff
Trenavin Technologies – Simon Reith
Winstar – Timothy Graham et al

Equipment manufacturers and suppliers who responded to requests for information on availability of equipment.

Marconi Communications – Margarete Senn
SpectraPoint Wireless – Lilly Sale
Siemens - Gunter Stipek
Nortel – Graeme King
Newbridge – Scott Robinson
Ericsson – Alex Gosman
Alcatel - Robert Pesavento
Lucent – Paul Mundinger

List of respondents to the directions paper entitled: Proposals for allocation of spectrum licences for the 27 GHz band (BWA).

Macquarie Equity - Anthony Bekker
Solomon Smith Varney - Mr Karyue Yeo
Nortel Networks - Graeme King
Ambidji Group - Les Kelly
Mentor Data Systems Australia - John Hawker
Cisco Systems - Christian Derrick
Comsyst Pty Ltd - Heather Childs
Paxys Pty Ltd - Simon Cathcart
AAPT - David Havyatt
Broadband Access Pty Ltd - John Murphy
Graeme Bell
Winstar International - Jennifer R. Chang
FuturePace Solutions - Barbara Phi
Appendix 2

Map of marketing areas