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AMTA Submission

Australian Communications & Media Authority

IFC 11/2022—Allocation of AWLs in the
3.4-4.0 GHz band in remote Australia



About AMTA

The Australian Mobile Telecommunications Association (AMTA) is the peak industry body representing Australia's mobile telecommunications industry. Its mission is to promote an environmentally, socially and economically responsible, successful and sustainable mobile telecommunications industry in Australia, with members including the mobile network operators and service providers, handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry. For more details about AMTA, see <http://www.amta.org.au>.



Introduction

AMTA welcomes the opportunity to provide comments on the draft apparatus licensing framework supporting area wide licences (AWLs) in remote areas of Australia across the 3.4-4.0 GHz band. Our submission is structured around the questions in the ACMA's consultation paper *"Apparatus licences in the 3.4-4.0 GHz band in remote Australia—Licensing, allocation process, technical framework and pricing arrangements—consultation paper"* ("the consultation paper").

Questions 1 & 2: proposed technical framework

1. *Do you have any comments, and supporting additional information, on the proposed technical framework, including the revised AWL LCD, draft RALI MS 47, and updated RALI FX3 and FX19?*
2. *Do you have any comments on the other issues referred to in the technical framework that have not been resolved in the TLG, such as WBB coexistence with radio altimeters?*

Introduction

In general, AMTA largely supports the revised AWL Licence Conditions Determination (LCD), draft RALI MS 47, and the proposed changes to RALIs FX3 and FX19, although there a number of points to address, outlined in the sections below headed with the name of the relevant RALI/instrument in question.

AMTA supports the following aspects of the Technical Framework as proposed by the ACMA in the consultation paper:

- **Radio Altimeters.** We strongly agree with and support "Approach A" proposed by the ACMA, which is to not introduce any additional mitigation measures beyond the 200 MHz guard band that exists between 4000-4200 MHz. We also support the ACMA's clarification in the consultation paper (top of page 10) that this issue will be studied further and therefore that any mitigations may be temporary or subject to future change. As such, we request the draft section 4.6 in RALI MS-47 is removed before the RALI is published.
- **Coordination at the boundary of a spectrum licensed area.** We strongly agree with the introduction of a more stringent device boundary for AWL transmitters close to the boundary of a spectrum licensed areas, which is based on the assumption that not all AWL and SL services can synchronise.

- **Fallback Synchronisation.** We support the ACMA’s proposal to specify a single synchronisation fallback frame structure to address the two scenarios of AWL-AWL and AWL-SL interference, which is aligned with that in the existing 3.4 GHz spectrum licences. Further comments on fallback synchronisation are provided below under the section on the Draft AWL LCD.
- **Minimum channel size.** We support the ACMA’s proposal for a minimum channel size of 10 MHz (middle of page 9 of the consultation paper), as this aligns with the bandwidths supported in the existing 3GPP standards for the 3.4 GHz-3.8 GHz spectrum band and is the minimum usable bandwidth for technologies likely to be used in the band.
- **Coordination with incumbents.** We support the ACMA’s proposed arrangements for coordination with point-to-point (PTP) links, FSS Earth stations, and incumbent point-to-multipoint (PMP) services as defined in the technical framework documents (the LCD and the three RALIs).

Draft AWL LCD

- Definition of ***“3.4 GHz band spectrum licence”***—can this be pre-empted to cover any spectrum licence in the range 3.4-3.8 GHz?
- Definition of ***“uplink-downlink configuration”***—it’s awkward to have uplink-downlink configuration 2 as part of the definition of a broader ***“uplink-downlink configuration”*** which also includes the special subframe configuration 6. We note that the existing 3.4 GHz spectrum licences describe the combination of uplink-downlink configuration 2 and special subframe configuration 6 as the “frame structure”. As such, we suggest replacement of ***“uplink-downlink configuration”*** with ***“frame structure”*** (except where the words “uplink-downlink configuration” are used to refer to the specific uplink-downlink configuration 2).
- Legislative requirement to comply with RALI MS 47—A feature of the purpose of RALIs is that they remain administrative documents reflecting ACMA policy that do not bind the ACMA by law and allow for exceptions in certain cases. At a minimum, there needs to be an exception to this legal requirement for the following cases:
 - where the ACMA grants out-of-policy exemption;
 - to allow flexibility to register transmitters under “guard space” as in the spectrum licensing framework;
 - where there is an agreement with the affected licensee (noting that draft RALI MS 47 only mentions agreements in the context of device boundaries and for coordination between AWL transmitters and adjacent-channel AWL receivers); and

- where the affected receiver or transmitter is that of the same licensee (i.e. self-management of interference).
- Synchronisation requirement—In accordance with RALI MS 47, an AWL transmitter must satisfy a more stringent device boundary condition (DBC) regardless of whether or not the AWL licensee intends to synchronise with the adjacent-area spectrum licensee. The only way that the device boundary (based on the more stringent DBC) can overlap a spectrum-licensed area is by agreement. Furthermore, the synchronisation requirement is only activated in the case of an AWL transmitter interfering with a spectrum-licensed receiver, not the other way around, which AMTA strongly supports. However, if the spectrum licensee is not currently employing the fallback synchronisation frame structure, then the interference would only be resolved if the spectrum licensee also implemented the fallback synchronisation frame structure. AMTA does not agree that this is an acceptable scenario. As such, we propose one of two alternatives:
 - Make a separate synchronisation requirement where the “other device” is a spectrum-licensed receiver, in which the AWL transmitter must synchronise¹ with whatever uplink-downlink configuration the affected spectrum licensee is currently operating with; or
 - That the AWL transmitter simply operates on a “no interference” basis with respect to the spectrum licensed receiver, and therefore would need to cease or down-power operation until the interference is resolved.

We note that Pivotel has some different views on the issue of the more stringent DBC, restricted-use bands and synchronisation requirements between AWLs and spectrum licences, and these will be presented in Pivotel’s individual submission.

¹ To clarify, the requirement for the AWL licensee to synchronise with the spectrum licensee is only activated after “no agreement between the licensee and each person operating one or more of the other devices can be reached on how to manage the interference”—i.e. the condition in subclause (1)(d)—and the time limit in subclause (2).

Draft RALI MS 47

Section 3.2: Licence conditions

Advisory Notes: In the Advisory Note *“Coexistence with existing apparatus licences”*, we believe more clarity would be achieved if the word ‘wanted’ were added: “... receiving wanted radio emissions from a radiocommunications transmitter that is operated under this licence.”

Section 3.3: Assignment rules

Minimum HCIS geography

We do not support HCIS Level 0 as the minimum geographic area for AWLs in remote areas. As per our advocacy during the TLG, we are concerned that allocation of spectrum on an HCIS Level 0 basis will lead to excessive geographic fragmentation as well as not being representative of likely spectrum denial caused. We strongly recommend HCIS Level 1 as the minimum geographic area for an AWL, as this a more realistic indicator of the spectrum denial caused by a transmitter in this band.

Assignment priority

We support the ACMA’s proposed assignment priority in section 3.3.5. However, we observe that subsection a), second bullet point in section 3.3.5 specifies *“Entities without 3.4 GHz spectrum licence holdings should be assigned spectrum **above 3700 MHz** and preferably occupying the same frequencies as any existing apparatus licence holdings”* (emphasis added). We propose this should be changed to *“**above 3800 MHz**”* given the range 3700-3800 MHz in metro and regional areas is to be auctioned, and hence, will be converted to spectrum licence holdings.

Section 4.1: Coordination at the geographic boundary

We note that a device boundary can spill outside the AWL licence area if the overspill is limited to an earth station protection zone (ESPZ) (s9(3) of the s145 Determination); if the overspill is limited to sea/ocean (except for the ducting corridors) (s9(4) of the s145 Determination); or if the overspill is limited to an adjacent AWL with which there is an agreement in place. We agree with these exceptions.

Section 4.2: Coordination with AWL receivers

We note that Part 8 of the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters — 3.4 GHz Band) 2015* (“the Tx RAG”) requires detailed coordination with co-channel, adjacent-area receivers, similar to what the ACMA is proposing for the case of adjacent-channel AWL receivers. To mirror these arrangements, should the requirement for detailed site-to-site coordination be extended from the adjacent-channel case to the co-channel case?

Questions for clarification to the ACMA:

- Is the text instructing the licensee to either re-plan or negotiate limited to only the adjacent-channel case?
- “The same procedure applies for a proposed AWL receiver...”—is this only limited to the adjacent-channel case?

Section 4.5: Coexistence with incumbent point to multipoint services

The consultation paper suggests that the coordination requirements to protect incumbent point to multipoint (P-MP) services is based on RALI FX 14, which is proposed to be retired. However, this is not true. RALI FX 14 described a process whereby a form of device boundary was calculated, but one where the device boundary along a particular radial was reached after a required amount of path loss was satisfied, rather than after a receive power threshold was reached. The coordination requirements in Section 4.5 of RALI MS 47 more closely resemble what used to be in RALIs FX 19 and MS 39.

In Step 3 of section 4.5.1, “Case 2” posited by the ACMA is applicable for a traditional cellular architecture in which the user equipment (UE) or customer premises equipment (CPEs) are communicating with associated infrastructure (access point or base station (BS)) which is registered and considered under “Case 1”. In this scenario, Case 2 is appropriate, except we recommend the deletion of the words “case 2”, along with the optional addition of either “base station” or “associated case 1”, as follows:

“However, an AWL transmitter may still be registered in the RRL if it can be shown that the coverage area of the ~~case 2~~ [base station/associated case 1] transmitter does not overlap the interference zone of the point to multipoint receiver – also see section 4.4.1 and Appendix B.”

However, there’s a potential further scenario which isn’t explicitly addressed, in which even the access points/BS are exempt from registration. Is this case simply covered by the “no interference” condition under which registration-exempt transmitters operate?

Section 4.6: Compatibility with radio altimeters

We strongly agree with and support “Approach A” proposed by the ACMA, which is to not introduce any additional mitigation measures beyond the 200 MHz guard band that exists between 4000-4200 MHz.

Thus far—save for references to a contested study by RTCA—no evidence has been produced by the aviation industry to support claims for the requirement to impose any interference mitigation

techniques on licensees in the 3.8-4.0 GHz band. This is despite a long engagement with all interested parties via an ACMA-convened technical liaison group (TLG), where no technical parameters or operating characteristics of deployed radio altimeters were made available, nor was any evidence presented by aviation industry representatives in support of their claims on potential interference into radio altimeters from 5G networks in the 3.8-4.0 GHz band.

That said, we do support the ACMA's clarification in the consultation paper (top of pg 10) that this issue will be studied further and therefore that any mitigations may be temporary or subject to future change.

Draft RALI FX 3

AMTA agrees with the proposed changes to RALI FX 3, with one additional recommendation. New fixed point to point (PTP) transmitters are required to coordinate with area-wide licences, as per new Assignment restriction 5. However, there are no specific protection criteria or methodology for PTP transmitters—for the protection of AWL receivers—in either RALI FX 3 or MS 47. We propose that the new Assignment restriction 5 should explicitly clarify that new PTP transmitters are subject to the requirements for coordination with AWL receivers in Section 4.2 of RALI MS 47.

On page 8 of the AWL consultation paper, the ACMA states its view that there should only be one channel raster (the existing 40 MHz channel raster) for PTP links in the 3.8 GHz band, and we support this position. As such, we agree with the amended channel diagram for PTP links and the associated changes and additions to the notes associated with the channel diagram.

Draft RALI FX 19

We note that there are substantial changes to provisions specific to the 1.9 GHz band, including the introduction of new coordination requirements in Section 2.4: *“potential adjacent-channel interference to spectrum-licensed base stations from BWA base stations is a similar situation to that of PTS base stations in the 2 GHz band receiving adjacent channel interference from the same BWA base stations. Consequently, similar processes for adjacent-channel coordination have been adopted in this RALI.”* The coordination procedure mentioned here is later detailed in Section 3.7. Section 3.7 broadly applies the coordination requirements of RALI MS 33, replacing the PTS base station (BS) receiver with the spectrum-licensed BS receiver, and then specifies that the applicable protection criterion is the Compatibility Requirement in the SL Rx RAG.

This is completely new and we do not agree with its consideration under this public consultation on 3.4-4.0 GHz. As such, we seek that the ACMA accept stakeholder input on this topic separately and at a later date.

For the time being, we note that there is mixing of two separate interference mechanisms—i.e. adjacent-channel selectivity (the thresholds in Step 4) and out-of-band emissions (mentions the tx emission mask in Step 3)—with no clear guidance on how to apply which or how to combine these for use in a frequency-dependent rejection (FDR) calculation. As such, this needs further work.

Lastly, we note that the existing RALI FX 19 has an Attachment 4 with a special Device Boundary calculation methodology & criterion for co-channel coordination of BWA transmitters with adjacent spectrum-licensed areas. It appears that this was removed from the draft new RALI FX 19, on the basis that there are no longer any spectrum licences in 1900-1920 MHz. This change can be considered more as part of a “clean up” of the document and we agree to its removal.

Questions 3 & 4: allocations process

- 3. *Do you have any comments on our proposal to use a multi-stage administrative allocation for apparatus licences in the 3.4–4.0 GHz band in remote Australia? Please provide any additional information in support of your views?***
- 4. *Do you have any views on the appropriateness of an allocation quantum policy? If an allocation quantum policy is adopted, do you have any views on whether that quantum should be 100 MHz or 150 MHz or some other quantum per single HCIS level 0 cell?***

We support the ACMA’s proposed ‘allocation window/allocation principles’ approach (page 13 of the consultation).

We strongly support the ACMA’s inclusion of priority assignment to a licensee who already has an AWL or spectrum licence issued within the band in a directly- or near-adjacent geographic area, such that the licensee is preferentially assigned a frequency range aligned as much as possible with any adjacent spectrum licence in the 3.4-3.6 GHz band.

We also agree with the part of the ACMA’s proposed assignment priority which requires applicants, those who do not hold spectrum licences, to have to apply for licences above 3.8 GHz, as we outline above in relation to section 3.3.5 of RALI MS-47.

Finally, we support an allocation quantum policy limit of 100 MHz, with the ACMA having the discretion to allocate a larger quantum than this if provided sufficient evidence by the applicant as to why more than 100 MHz of spectrum is required.

Question 5: Tenure and renewal

5. Do you have any comments on our licence tenure and renewal policy for AWLs in the 3.4–4.0 GHz band in remote areas?

We recommend AWLs should be required to expire on the same date as existing 3.4 GHz and 3.6 GHz spectrum licences, namely, 13 December 2030. Tenure of AWLs in remote areas beyond 13 December 2030 has the potential to be an impediment to defragmentation of the 3400-3800 MHz band, especially where the AWL is immediately geographically adjacent to a regional area spectrum licence. As such, we strongly recommend AWLs are required to expire on 13 December 2030.

We have no concern with the ACMA issuing renewal statements to remote area AWL licensees permitting them to apply for renewal of their AWL for the period commencing 14 December 2030, although we strongly recommend that any such renewal statement should include notice that the ACMA will have the discretion and ability to require the licensee to re-tune to a different frequency in the wider range of 3400-4000 MHz, while retaining the same bandwidth. This will provide the ACMA the ability to re-stack remote areas of Australia to line up with any restack of 3400-3800 MHz in regional/metro areas, such that spectrum licensees in metro/regional areas can have geographically contiguous spectrum holdings nation-wide (i.e., the ACMA also re-stacks 3400-4000 MHz in remote areas to align with any re-stack in regional/metro areas).

Question 6: Pricing

6. We are proposing \$/MHz/pop tax arrangements for AWLs in this band, similar to AWLs in the 26/28 GHz band, and similar to other area-based licences such as PMTS B apparatus licences, because we believe it to be a simple pricing arrangement well-suited to area-based licences no matter the size of the licence or where it is located. Do you have any other pricing alternatives, or suggestions that may improve upon our proposal?

We support the ACMA's proposed price of \$0.0041/MHz/Pop and the minimum licence tax of \$41.37. We do not propose any pricing alternatives.

In Table 1 of the consultation paper, "HCIS 1 block (equivalent to 25 HCIS 0 cells)" is potentially misleading, because it implies that the pricing of the HCIS 1 block is based on the price of a HCIS 0 block, which is of course not the case. If anything, it should be listed one HCIS 0 block incurs 1/25th of the tax applicable to the HCIS 1 block within which it lies.

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