

Consultation on area-wide apparatus licence

Submission by Commercial Radio Australia

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Introduction

Commercial Radio Australia (CRA) welcomes the opportunity to comment on the area-wide apparatus licence (AWL) proposed by the Department of Communications and the Arts (Department) for industry consultation (Draft Legislative Package).

The area-wide apparatus licence proposed should provide flexibility and be complimentary to existing licence types by providing a scalable licensing option to support area-wide multi-device deployments.

CRA can see a number of opportunities for broadcasters to more effectively operate their businesses using AWLs in conjunction with state-of-the-art communications technologies as used in 5G wireless communications. This is in-line with the ACMA's identification of 5G IoT opportunities.

Executive summary

Overall concept

The AWL concept appears to be a useful development particularly as we advance into the era of IoT. It may provide opportunities to streamline the deployment and operation of a range of network and service types. That streamlining may include reduced process and licencing costs.

The paper however is short on examples to help guide the audience on how an AWL could be used. It lacks guidance on feasible frequencies, geographical area sizes and potential power limitations and boundary conditions.

To be able to make informed assessment of the use of AWLs and balance the opportunities and costs that the AWL type could foster more detailed information and guidance is needed. The review of the consultation paper also identifies a number of areas of concern:

- **regulatory certainty**

Broadcasters require a high degree of certainty with respect to operational integrity of mission critical RF systems including OB links, STLs and broadcast transmissions. While it may be useful and cost effective to utilise AWLs in the future that should not be at the expense of operational integrity;

- **predictability**

The use of the AWL type may allow the aggregation of certain types of transmissions into a single licence. This could provide operational and financial savings for both broadcasters and the ACMA. In order to assess such saving and weigh the costs and benefits further information is required from the ACMA about the details of pricing of AWLs

- **commercial flexibility**

The broadcast industry is constantly looking to improve commercial viability. Flexibility is often critical to achieve operational improvements. The AWL type may well provide new opportunities to streamline licencing and reduce the time to deploy new and often urgent transmission assets. To be able to assess the benefits, risks and costs involved with using the AWL type further details of the technical and pricing aspects are required.

CRA suggest that the next steps in the process of introducing the AWL type after the publication of the responses to this consultation be a further update from the ACMA providing details and guiding examples including:

- Frequency bands which can be used for AWLs;
- Technical specifications of AWLs;
- The outlining of the power footprint and interference assessment methods to be used;
- Guidance on the pricing to be used, e.g. for aggregated transmissions;
- Guidance on what can, and cannot be aggregated to form an AWL.

Issues for comment

1. Characteristics

ACMA question: “Do you think the proposed characteristics of the AWL type will support your current or intended network deployments? Are there any other kinds of deployments that you believe the AWL type should support?”

The current definitions of AWL licences, apparatus types and usage scenarios are very loose. While this is intended to provide flexibility it would be useful to guide the audience in a consultation environment with some typical examples where such licences could be used.

The broadcasting industry has many examples of situations where multiple devices need to communicate within a specific area to provide reporting on the status of events. Some examples include:

- Stadium events where multiple input devices such as microphones, cameras and potentially scoreboard and other measurement and analysis devices are used. Note that while radio has traditionally been an audio only medium, the industry is undergoing profound changes with video and multimedia content now being used in addition to the traditional core audio offering.
- Multi-site events such Commonwealth Games, golf tournaments, Royal shows or multi-concert venues such as Bluesfest where the reporting can be over an extended geographical area and involve a wide variety of inputs many of which can be ‘mission critical’, that is to say must be error free.

Such Outside Broadcast (OB) events are covered today using sophisticated OB trucks which contain the necessary equipment for input processing, editing, reviewing, consolidation, and delivery to other studios and ultimately the public via a combination of broadcasting and IP services. While wireless techniques have been used for some of these activities it is only now that we are starting to see the transfer of the traditional control room in the OB truck to the broadcaster’s main studio through the use of 5G technologies. A good example is the recent demonstration by BT Sport when covering an event at Wembley Stadium in London where video camera outputs were fed directly to

the studio and mixing/editing activities where done using the studio's equipment rather than an OB truck¹.

This shift in 'mechanics' will likely yield significant cost savings for OB events and allow broadcasters to provide more content which is live&local.

So far the consultation has focused on IoT over 5G mobile however there can be several other scenarios where an AWL could be useful. This can include many types of applications some of which also relate to radio broadcasters.

One such situation could be news gathering via satellite where LEO microsats are used to periodically upload information captured in the field, e.g. for a pseudo-live documentary, or natural disaster situations. Such LEO satellite data gathering has gained significant momentum but to date has mainly focused on industries such as mining, farming and transport to gain pseudo-realtime knowledge of assets in the field.

So a question arises as to whether satellite communication systems will be included in the AWL type to allow broadcasters, or farmers, to deploy a network of devices to gather information within the field of interest. In this case, as with 5G or similar terrestrial systems, all the transceivers within the designated geographic area could be 'pre-licensed' under a single AWL and assets deployed on an as needed basis.

Another example where AWL may be useful is for permanent systems used by broadcasters. This could be within a studio complex where wireless interconnect devices could conceivably become the RF cabling of the future, no more Cat.6 cabling. Such a migration is unlikely to be able to be done using the current ISM bands due to bandwidth constraints and hence is likely to require wide bandwidth spectrum in the mmWave band, possibly the 26 GHz band.

While 5G telco systems may be able to be used for these types of applications it is also quite conceivable that customised equipment could be used based on 5G technologies, which will focus on the most spectral efficient communications for a mix of fixed, mobile and transient end points.

Indeed such operations could occur at multiple sites within a city or a radio Licence Area (LA).

This raises the question of the geographical area that can be applied for AWLs, could a broadcaster obtain an AWL for specific communications between multiple end points within their commercial radio LA?

The current definitions do not state any requirement for the AWL to operate in a single band, hence it is conceivable that the device network could operate in multiple bands simultaneously, with each band being used for specific purposes, e.g. one band might be for local data gathering and another band be for aggregated information delivery.

Under current arrangements devices in each band would require licensing. It would be useful to provide guidance on what network characteristics are considered within the scope of AWLs.

The consultation paper describes the key attributes of the AWL type on page 7. The description provided could be viewed as a spectrum licence, limited by its geographic area and position.

AWLs should not be constrained to 5G frequencies and services. The concept can utilise 5G like techniques without being constrained by the requirements of 5G spectrum licences. For example in stadium situations it may be beneficial to use a dedicated communications network to deliver the

¹ See <https://www.broadbandtvnews.com/2018/11/22/ee-bt-sport-demo-first-live-5g-broadcast/>

required communications to a central point which then delivers the aggregated content to a production centre as if it was 'local' via 5G or other telco services. This effectively removes OB trucks from sites with only the delivery of aggregated content being provided by telcos and makes it much easier and cost effective to create 'local' content even though the production centre is remote.

2. Spectrum bands and geography

ACMA question: "Which bands and/or geographic areas do you believe would be conducive to the use of an AWL?"

In the current draft legislation² the ACMA does not propose any specific frequency bands or geographical areas, or area sizes.

The 26 GHz band is specifically identified for the use of AWLs. The use of the 26 GHz band is considered in the ACMA's consultation "Draft spectrum reallocation recommendation for the 26 GHz band in cities and regional centres" May 2019.³

The 26 GHz band has mainly focused on use by Telcos to provide 5G high data rate services. While this seems a reasonable approach CRA suggest that there could be other organisations and systems which could also utilise the 26 GHz band. Indeed this is observed in the recent consultation for the reallocation of 26 GHz spectrum where there are many references to 'spectrum-space' apparatus licences which are the same as the AWL type discussed in this response.

Australia has a number of ISM bands for free use by low power devices e.g. WiFi. The 24-24.25 GHz band is included for ISM applications worldwide. This provides some opportunities for IoT communications in industrial settings, including radio studios. The ISM band can also be used for external long distance links, e.g. airFibre provided by Ubiquiti⁴ although that use is at the users risk with respect to local interference and products are currently limited to the 2.4 and 5 GHz ISM bands.

A similar band could be provided on a AWL basis in the 26 GHz band for use by private AWL systems which may be implemented on limited time and geographic area bases.

This would allow broadcasters to utilise that spectrum in an efficient manner based on event needs. The spectrum should be sufficient for multiple broadcasters to be able to gather and deliver their content for production purposes.

The current consultation for the proposed licencing amendments do not provide any guidance to the audience on what the ACMA considers to be fair geographical areas of use. This essentially means that an AWL could be country wide, or limited to a very small area. The use in these extreme scenarios could also be quite different.

The current documentation indicates a determination of suitability for licencing on a case-by-case basis. This seems to lack transparency and leave the determination open for dispute and the potential for non-level playing field situations.

² Draft Radiocommunications Legislation (2019 Measures No. 1) Instrument 2019 and Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2019

³ CRA notes that this consultation closed on 6 June 2019 but is part of an ongoing process as described in Table 7 of the consultation document.

⁴ <https://www.ui.com/products/#airfiber>

Rec 1: CRA recommends that the rules used to decide what a valid geographical area is be defined. To this effect CRA recommends that the licencing process includes the analysis of the use of existing spectrum by existing and future services in bands of interest before considering use by other/new services.

3. Technical matters

ACMA question: “What technical and other matters do you believe the ACMA should consider in deciding to use AWL licensing in a particular band?”

The interference limits for AWLs are not clearly defined. It is expected that the current interference protection practices could be utilised but allowance will need to be included for the spatial aspects of multi-transmitter networks within the defined geographical area.

The ACMA seems to be proposing a licencing basis which is examined individually on a one-off basis. It would be useful for the ACMA to provide descriptions of the methods which would be used to undertake AWL interference studies for different bands. Such methods would be used to assess the power footprint in a particular area and the limits which cannot be exceeded. That power footprint is the sum of all transmissions within the geographic area of the licence and may be quite low if the transmitters are homogeneously distributed, it may also have strong peaks if the transmitters are closely grouped. In the latter situation there could be boundary condition situations, or requirements to avoid interference with existing services.

Rec 2: CRA recommends that the ACMA provide an outline of the methods that would be used to assess power footprints in a geographical area and how that would be used to assess interference with existing services

4. Other comments

ACMA question: “Do you have any other comments on the AWL concept?”

Application to specific bands

The implications of the statement “consider the technical and economic implications of allowing both AWLs and other apparatus licence types to be issued in the same frequency band” could be significant. This in effect indicates that the ACMA may be willing to grant licences to AWL users in bands currently allocated to other systems.

The lack of definition of frequency bands for use with AWLs and the restriction to interference that may be generated is of concern. Broadcasters, and other radio spectrum users, will expect their current spectrum uses are protected and not subject to possible interference from newly established services. For example the spectrum used for Studio to Transmitter Links (STL) and Translator links.

The commercial broadcasting industry is concerned about potential interference with existing links, e.g. STLs and microwave links, and suggest that the frequency bands for such links be excluded from the AWL licence type. STLs are currently licenced individually and frequencies are allocated on a no-interference basis, that interference for a specific frequency being limited by the type of link and the geographical situation. The use of AWL systems near established links could impact their mission critical operation either in an on-going basis or on an occasional basis dependent on the geographical distribution of the AWL transmitters.

We note the potential use of spectrum sensing devices / cognitive radio systems which utilise “unused” spectrum in assigned bands for other purposes e.g. IoT. This has been proposed for UHF

bands especially the DTV band. Given the congestion in the FM band and the very limited spectrum in the VHF Band III DAB band CRA suggests that those bands are not viable targets for AWLs.

Rec 3: CRA recommends that the frequency bands used for STLs, and broadcasting services be excluded from consideration for AWLs.

Device coordination and registration

The ACMA paper states that “AWLs will not require coordination of devices prior to issue of the licence. Further, AWLs will generally not require registration of devices prior to the device being operated.”

This indicates that AWLs will be coordinated on a group basis and licenced accordingly. This again is very open ended with potentially 100s of devices being able to be deployed in the geographical area. This may be applicable to some situations, e.g. remote mining sites but also may be useful in urban environments.

It will be useful to understand what limits will be applied to the number of devices under an AWL. Will there be a maximum number of devices allowed to be operational at any one time? Will this include devices which operate intermittently? In some cases the transmitters may not operate randomly but operate simultaneously causing a peak in power transmission and potentially interference. It would be useful to understand the methods used to assess such power footprint peaks, as per CRA rec 2.

Pricing

Under the concept of AWL the paper states on p7 that “An AWL would authorise the operation of multiple radiocommunications devices in a particular frequency band within a particular geographic area, subject to any conditions placed on, or applicable to, the licence.”

Under pricing on p10 the paper states “The ACMA proposes to adopt a consistent approach to the pricing of AWLs across multiple bands using set of parameters (for example, frequency band, lot size, population coverage), with weighting of each parameter needing to be considered on a band-by-band basis.”

Will the ACMA allow existing apparatus licences to be grouped together to for an AWL? For example STLs and microwave links in specific bands could be grouped under an AWL. Such an approach may simplify administration and reduce costs for both broadcasters and the ACMA. In this case could the broadcaster then add an additional link when implementing a new Tx to their network under that AWL without further consultation?

While the ACMA proposes the inputs to a pricing formula, i.e. frequency band, lot size, population coverage, there are no examples of pricing to allow prospective users to understand what is likely.

Rec 4: CRA recommends that the ACMA provide more formal guidance on pricing of AWL licences.

Draft Radiocommunications Legislation (2019 Measures No. 1) Instrument 2019

The proposed amendments do not require users of AWL devices to define their use in anyway, “unless there is a condition in the *Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2019* or a condition in the licence stating that the Register must contain those

details.”. The proposed determination only requires the licensee to provide information if requested by the ACMA or other person.

This seems at odds with the amount of information that is usually required for obtain a radiocommunications licence.

The proposed amendments are very broad and do not provide any clear indication of how an AWL would be used.

It also would appear to make the determination of the AWL system specifications very difficult to obtain. For instance if a AWL is established and some interference is experienced by an existing spectrum user the route to determine the cause of the issue and the resolution / remediation is unclear. This leads to uncertainty regarding the impact of new services on existing ones.

Transmitters and receivers appear to have separate schedules, what about transceivers (both Tx and Rx), how will they be treated?

What about satellite based systems, e.g. data gathering via LEO microsats. An AWL could conceivably cover all transceiver devices across a target area. Broadcasters may wish to deploy transceivers across that target area for the duration of a specific event. Would the satellite service operator be responsible for an AWL, e.g. whole of country, or would the broadcaster be responsible to obtain an AWL licence for the duration of the event in a specific geographical area? Given that such data gathering could be used for disaster situations, is it possible to have a ‘proforma’ application which can very quickly provide the required AWL?

Examples of boundary conditions would be useful. Is this, for example, a maximum field strength at the edge of the geographical area? Would that be at specific locations? Are there any height restrictions? What if the boundary is located on a high area or mountain, or tall building?

The arrangements for AWLs need to be more clearly stated with the rationale being transparent. Under the currently described process the ACMA will have liberty to decide what licence arrangements are granted on a case by case basis. Perhaps the various industries which could use such AWLs would prefer more clarity on the conditions that are likely.

Radiocommunications Licence Conditions (Area-Wide Licence) Determination 2019

This document is intended to clarify the conditions of operating an AWL and ties the AWL type into the *RadioCommunications Act 1992*.

It also provides a clause requiring the user of an AWL to provide information about what equipment is deployed under an AWL. Curiously the AWL holder does not need to disclose anything about mobile stations used within an AWL. This could be interpreted as mobile stations presuppose the use of telco services. This however may not be the case in many circumstances, for example if a proprietary, non-telco, system is established in a stadium or OB event area, or if satellite communications are used for efficient operation in wide area situations.

CRA suggest that the wording of this document be clarified to allow a clear understanding of what transceiver devices could be used.

Conclusions and next steps

The above discussion has identified a number of opportunities that the AWL type could foster but also identifies a number of questions on how the could be operated. This leads to uncertainty on the application and use of AWLs with several areas of concern:

- **regulatory certainty**

Broadcasters require a high degree of certainty with respect to operational integrity of mission critical RF systems including OB links, STLs and broadcast transmissions. While it may be useful and cost effective to utilise AWLs in the future that should not be at the expense of operational integrity;

- **predictability**

The use of the AWL type may allow the aggregation of certain types of transmissions into a single licence. This could provide operational and financial savings for both broadcasters and the ACMA. In order to assess such saving and weigh the costs and benefits further information is required from the ACMA about the details of pricing of AWLs;

- **commercial flexibility**

The broadcast industry is constantly looking to improve commercial viability. Flexibility is often critical to achieve operational improvements. The AWL type may well provide new opportunities to streamline licencing and reduce the time to deploy new and often urgent transmission assets. To be able to assess the benefits, risks and costs involved with using the AWL type further details of the technical and pricing aspects are required.

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- Guidance on the pricing to be used, e.g. for aggregated transmissions;
- Guidance on what can, and cannot be aggregated to form an AWL.

Annex A: Summary of recommendations

Rec 1: CRA recommends that the rules used to decide what a valid geographical area is be defined. To this effect CRA recommends that the licencing process includes the analysis of the use of existing spectrum by existing and future services in bands of interest before considering use by other/new services.

Rec 2: CRA recommends that the ACMA provide an outline of the methods that would be used to assess power footprints in a geographical area and how that would be used to assess interference with existing services

Rec 3: CRA recommends that the frequency bands used for STLs, and broadcasting services be excluded from consideration for AWLs.

Rec 4: CRA recommends that the ACMA provide more formal guidance on pricing of AWL licences.

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