



# **nbn's submission on the proposed apparatus licensing arrangements in the 26 GHz and 28 GHz bands - consultation 25/2020**

23 September 2020



Thank you for the opportunity to comment on the issues in the ‘Apparatus licences in the 26 GHz and 28 GHz bands, Licensing, technical framework and pricing arrangements consultation paper, August 2020’.

**nbn**’s spectrum requirements are developed to ensure that it meets the Federal Government’s expectation that all Australians have access to very fast broadband as soon as possible, at affordable prices, and at least cost to taxpayers, and that upgrade paths are available as required. The flexibility of the multi-technology mix approach enables **nbn** to build the network using the technology best matched to each area of Australia, and spectrum requirements are determined in this context.

In responding to the specific questions raised, we have considered both:

- the customer experience delivered to Australians including in rural, regional and remote areas by the existing satellite network services and potential upgrade paths; and
- the growing customer experience requirements and need for upgrade paths for the existing fixed wireless network.

1. The ACMA is proposing to use a two-stage administrative allocation for apparatus licences in certain segments of the 26 GHz band and in all of the 28 GHz band. Do stakeholders agree with this approach? If not, please explain why.

We support ACMA’s proposal for a two-stage administrative allocation to assist in managing the demand for area wide apparatus licences (AWLs) in the bands and have the following specific comments:

- It is appropriate to issue licences according to the proposed RALI where there are no competing applicants.
- A negotiated outcome assisted by the ACMA appears to be the most efficient way to resolve competing demand for spectrum in the same band and geographic location where there is sufficient spectrum in the band.
- The consideration of pre-defined principles to resolve cases of competing demand where there is insufficient spectrum in the band in particular geographies also appears appropriate.
- We support reverting to a first-in-time basis for administrative apparatus licence allocations following the initial allocation rounds.

We note **nbn**’s requirements [C-i-C] [C-i-C] to provide an upgrade path for its fixed wireless networks in line with the Government’s Statement of Expectations, new SIP requirements, and to meet growing customer experience requirements. These objectives also align with all of the Government’s *Communication Policy Objectives for the 26 GHz band* which the Minister requested that the ACMA have regard to in allocating 26 and 28 GHz band apparatus licences. This includes the objective of encouraging investment in infrastructure, particularly in regional Australia.<sup>1</sup> [C-i-C] [C-i-C]

2. Do stakeholders have any concerns with the licence duration and renewal policy for AWLs in the 26 GHz and 28 GHz bands?

**nbn** considers that issuing AWLs for the bands for no more than five years before renewal is a suitable time frame noting the technology to be deployed and the potential return to market of unused spectrum.

<sup>1</sup> <https://www.communications.gov.au/documents/communications-policy-objectives-allocation-26-ghz-band> and <https://www.communications.gov.au/sites/default/files/allocation-limits-direction-for-26-ghz-auction-signed-letter-to-acma-chair-ecl.pdf>

We support the proposal that the ACMA may decide not to renew an issued licence, or alternatively may renew a licence with new or varied conditions, in circumstances where the licensed spectrum has not been used and there is unmet demand.

There is value in securing a common and contiguous spectrum holding from the outset noting the related cost efficiencies for equipment that can typically only operate across contiguous spectrum. Contiguous holdings also enables flexible network planning and carrier expansions as demand grows. Further, in optimising network deployment, it may not be necessary to deploy to all sites or utilise all spectrum in an initial phase.

**[C-I-C] [C-I-C]**

Therefore, we propose that the ACMA retain some discretion to fully renew licences in circumstances where some of the spectrum has not been used in some geographies and / or frequency ranges by the time of licence expiry.

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| 3. The ACMA is proposing that AWLs be available for issue for the operation of FSS earth stations in the 27–29.5 GHz range. Do stakeholders support this proposal? If not, please explain why. |
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**nbn** supports the proposed use of AWLs given the effect of reducing spectrum access charges for satellite services closer to their true spectrum denial cost, which is close to zero in most cases.

Some consideration would need to be given to the fact that fixed satellite services (FSS) comprises point-to-multipoint links between ground and sky, and as such does not cover “areas” in the same way as terrestrial services. This is reflected in the fact that the same frequency and area can be (and often is) shared among many satellite operators, with many co-sited Earth stations a reality at multiple locations across Australia. The concept of ownership of an entire area by one operator would, in this case, be an excessive burden and barrier to access to other operators who might already have a coordination agreement with the operator in question.

Provided these points are adequately taken into consideration in the AWL regime, the idea that they apply to satellite services could be supported, especially given the potential cost reduction mentioned above. See our response to Q5 below regarding our support for ACMA’s proposal to use overlapping AWL licences for FSS earth stations.

4. The draft technical framework is optimised for both wireless broadband and FSS earth stations. Fixed earth stations in the range 29.5–30 GHz are still authorised under a fixed-earth apparatus licence. We are seeking views on a proposal to authorise FSS in the 29.5–30 GHz range with AWLs. Do stakeholders have any comments about this proposal?

The 29.5-30 GHz frequency range as a satellite only band is not subject to any regulatory requirements related to coexistence other than those pertaining to intra-service between FSS and mobile satellite service (MSS) systems. In comparison to the proposed use of AWLs in the 27-29.5 GHz frequency range as a means for facilitating terrestrial service sharing, many of the benefits of using AWLs will not be realised in the 29.5-30 GHz frequency range, but much of the added complexity will remain. Despite these considerations, if similar cost reduction could be achieved for satellite services in 29.5-30 GHz then the use of AWLs is supported.

5. Do stakeholders have any specific comments about the draft AWL LCD or RALI [new] or updated RALI MS 38?

**nbn** appreciates the efforts that have been made to balance the requirements of the incumbent and future spectrum users in both the 26 GHz and 28 GHz bands. We support the use of the 28 GHz band for fixed wireless on a secondary or co-primary basis and are confident that the proposed technical conditions will protect fixed satellite services operating without interference and enable shared use of the band.

The proposal to use overlapping AWL licences for FSS earth stations appears appropriate to accommodate the practicalities of current and future earth station deployments. **nbn** supports replicating RALI MS 38 in the RALI [new] to ensure ongoing consistency of management and co-ordination regardless of licence type. This approach could also be used to enable the application of the AWL to 29.5-30 GHz.

**nbn** agrees that the proposed application of the RALI [new] to fixed transmitters that are not base stations is suitable and that the proposed record keeping requirements strike an appropriate balance of obligations that is not too onerous.

**nbn** also supports the proposal of a fallback synchronisation approach, particularly where the frequency is adjacent to another licence type in geography. Of the two proposed configurations, FR2.120-2 appears to be preferable at this point, however, we do note the increased likelihood of different use cases warranting significantly different slot configurations in the future. For instance:

- the different use of broadband in light of COVID19 considerations has resulted in significantly higher demand for uplinks than anticipated; and
- for longer range networks, such as those envisaged by **nbn** a much higher number of guard symbols may be required,

resulting in a desire to switch DL to UL less frequently than DDSU or even DDDSU.

Given this it may be prudent to accommodate unanticipated changes in demand and consider an allocation channel raster with suitable guard bands if demand is significantly below supply during the allocation process. This could be done either pro-actively or by request if a materially different slot configuration is expected to be required.

With respect to the application of the TRP limits and EIRP masks, **nbn** supports the proposal and common approach outlined in the 26 GHz Spectrum Licence condition consultation. Defining a low baseline to allow flexible and unencumbered deployments, with the 'upper limit' approach to facilitate specific capabilities, but with added protection to the FSS users creates an effective and practical sharing environment.

As noted in our 26 GHz Spectrum licence draft allocation instruments and technical framework response, the management of TRP is central to managing the interference potential to FSS.

**nbn** proposes that the core conditions relating to scaling factor would be more effective if it was linked to an alternative bandwidth reference for the TRPs. We suggest scaling all power levels to **50 MHz** bandwidth. This alternative reference aligns with the minimum channel size for the spectrum licenses and also aligns relatively well with the smallest carrier size available for FR2 5G configurations. In practical terms, this alternative reference of 50 MHz would therefore effectively capture the highest anticipated power spectral densities.

To emphasise the point that proportionately higher TRPs are permitted for channels wider than 50 MHz, Note 2 could be modified to indicate that operations in channels wider than 50 MHz the TRP can be scaled logarithmically.

Additionally, as discussed in relation to the 26 GHz band, we advise that the conditions proposed to apply *outside* the gateway footprint areas may inadvertently result in interference into satellite services to be dominated by terrestrial emissions outside the main beams of **nbn**'s satellites, and that this effect would work against the very carefully designed rules which apply inside the gateway footprint areas. One approach that could avoid the risk identified under the current proposed conditions would be to extend the gateway footprint areas beyond the 3 dB contour. Extending to a -12 dB relative gain contour would not extend the geographic area significantly but would provide adequate protections.

Alternatively, **nbn** suggests a similar approach as that proposed by ACMA to apply *within* gateway footprint areas in regards to TRP increases also applies *outside* these areas. We propose amended conditions to apply as follows:

- A new baseline of 30 dBm (per 200 MHz), increased by 5 dB to account for the mitigation provided by the satellite beam off-axis suppression. The same baseline pointing restrictions applying inside the gateway footprint areas would also apply outside.
- An additional allowance of TRP up to 37 dBm (per 200 MHz), on the condition of no additional interference compared with the baseline. This could be achieved by taking the EIRP mask applying inside the gateway footprint areas and relaxing it by 5 dB.
- No invocation of No. 4.4, which would be inadvisable in a band used by a number of domestic and international high throughput satellite services, including the critical national infrastructure operated by **nbn**.

The proposed amendments are summarised in the Tables below and would ensure a more balanced interference environment in which emissions *outside* gateway footprint areas would be no more interfering than those *inside*.

Table 2

Frequency/area	TRP limit	Additional conditions <sup>2</sup>
25.1–27 GHz all areas	<del>34 40</del> dBm/50 <del>200</del> MHz (baseline)	No extra conditions
	<del>39 45</del> dBm/50 <del>200</del> MHz (upper limit)	Antenna pointing restrictions* and EIRP mask
27–27.5 GHz outside gateway footprint areas	<del>24 37</del> dBm/50 <del>200</del> MHz (baseline)	Extra antenna restrictions developed in the TLG** <del>No extra conditions</del>
	<del>31 42</del> dBm/50 <del>200</del> MHz (upper limit)	Antenna pointing restrictions* and EIRP mask
27–27.5 GHz inside gateway footprint areas	<del>19 25</del> dBm/50 <del>200</del> MHz (baseline)	Extra antenna restrictions developed in the TLG**
	<del>24 30</del> dBm/50 <del>200</del> MHz (upper limit)	Antenna pointing restrictions* and EIRP mask
27.5–29.5 GHz	<del>19 25</del> dBm/50 <del>200</del> MHz (baseline)	Antenna pointing restrictions***
	<del>24 30</del> dBm/50 <del>200</del> MHz (upper limit)	Antenna pointing restrictions* and EIRP mask

<sup>2</sup> In addition to adhering to *resolves* 2.1 and 2.2 of ITU-R Resolution 242 (WRC-19).

Table 3

Elevation angle above the horizontal plane (el)	Radiated maximum true mean power (dBm/200 MHz EIRP)		
	For transmitters in 25.1–27 GHz	For transmitters in 27–27.5 GHz and outside footprints	For transmitters in 27–27.5 GHz and inside footprints
5 degrees $\leq$ el < 15 degrees	$= 62 - 1.3(el - 5)$	-	-
15 degrees $\leq$ el < 25 degrees	49	39 46	34
25 degrees $\leq$ el < 55 degrees	$= 49 - 0.43(el - 25)$	$= 39 46 - 0.43(el - 25)$	$= 34 - 0.43(el - 25)$
55 degrees $\leq$ el $\leq$ 90 degrees	36.1	26.1 33	21.1

It is suggested that the values in the Table above defining mask limits be normalised to 50 MHz, i.e. all limits subtracted by 6 dB. This is to align with the scaling concept explained above.

**nbn** believes technology and commercial solutions are likely to develop and improve within the next 2-3 years such that it may be possible to demonstrate an ability to meet the EIRP mask with higher TRPs than those set in the current 'upper limit'. In this case it would be appropriate for the ACMA to amend the regulations in relation to this value whilst maintaining the EIRP mask.

**nbn** notes the other approaches proposed to mitigate interference, however, we support the approach taken in RALI [new] as suitably balanced without needing to add further complexity or controls.

6. Do stakeholders agree with the proposed apparatus licence tax? As explained in [Appendix A](#), at this time in Australia there is limited information about the value of the spectrum on offer for administrative allocation. The ACMA is open to reviewing the apparatus licence tax for AWLs in light of developments in domestic markets that have occurred or will occur over time. What considerations should the ACMA take into account?

**nbn** agrees with the proposed apparatus licence tax given the limited information available about the value of the spectrum on offer for administrative allocation. We propose that the ACMA considers whether there is evidence of unmet demand in the respective bands when deciding whether to review the apparatus licence tax for AWLs.

We support the option for a holder of a licence with a duration of more than one year to have the choice of making payment upfront, or alternatively by annual instalments.