



AMTA

Australian Mobile
Telecommunications
Association

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Communications & Media Authority

Response to consultation on review of the 2.5 GHz band spectrum licence technical framework



Response on 2.5 GHz band

The Australian Mobile Telecommunications Association (AMTA)—part of the Australian Telecommunications Alliance (ATA)—is the peak industry body of Australia’s mobile telecommunications industry. Our purpose is to be the trusted voice of industry, promoting the adoption, monetisation and sustainability of mobile telecommunications technology for the benefit of all Australians.

AMTA members include the mobile network service providers, handset manufacturers, network equipment suppliers, retail outlets and other suppliers to the industry.

AMTA welcomes the opportunity to provide this submission in response to the ACMA’s consultation on “Review of the 2.5 GHz band spectrum licence technical framework”.

If you have any queries or comments in relation to the content of our submission, please contact Chris Coughlan, Head of Spectrum and Network Infrastructure, on 0401 988 322 or by email: c.coughlan@austelco.org.au.



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Executive Summary

AMTA welcomes and appreciates the opportunity to respond to the ACMA's consultation paper "Review of the 2.5 GHz band spectrum licence technical framework" ("the consultation paper").

We note that the consultation paper focuses on a subset of specific aspects of the 2.5 GHz spectrum licence technical framework (SLTF), and does not represent a comprehensive review of the entire 2.5 GHz SLTF—including the two Radiocommunications Advisory Guidelines (RAGs) and one "Unacceptable Levels of Interference" (ULOI) Determination made under s145 of the *Radiocommunications 1992* ("the Act"). In part, this is due to the limited scope of the Technical Liaison Group (TLG) held in Q4 2025 itself, discussed further in Section I below. In this regard, we welcome the ACMA's openness to consideration of further changes (see pg. 4 of the consultation paper) under the expiring spectrum licences (ESL) process¹ **and strongly support this proposal**. While we recognise that the ACMA has established these working arrangements, we would recommend addressing as many changes as possible under this (current) consultation process. Doing so would provide greater regulatory certainty to licensees, reduce the volume and complexity of matters deferred to the ESL process, and help ensure that the Q1 2027 process can focus on the more substantial strategic and framework issues associated with licence renewal.

Our position on key aspects of the SLTF is summarised as follows:

1. **Specification of emission limits in terms of TRP:** We strongly support the following emission limits being specified in terms of total radiated power (TRP):
 - a. for AAS transmitters in the upper band;
 - b. for Non-AAS transmitters in the upper band (in-band emission limits only);
 - c. for UE transmitters in the lower band; and
 - d. for receiver spurious emissions.
2. **Specification of emission limits in terms of conducted power per port:** We strongly support emission limits for Non-AAS transmitters in the upper band—for non-spurious emissions falling within 2615–2700 MHz and for spurious emissions outside 2490–2800 MHz—being specified in terms of conducted power per port.
3. **In-band emission limits for upper band transmitters:** As per the TLG, AMTA can accept the ACMA's proposal of +50.2 dBm/5MHz TRP for the interim period, but requests that—either under this consultation process

¹ The ESL process will consider the SLTF that would be applied to renewed licences, and is earmarked to commence in Q1 2027.



or as part of the ESL process—the ACMA consider a slight increase to +53 dBm/5MHz TRP to align with the minimum TRP value recommended in Table 2 of ECC Decision (05)05.

4. **Unwanted emission limits for upper band transmitters:**

- a. We support the ACMA’s proposed (non-spurious) emission limits within 2620–2690 MHz and 2490–2615 MHz, provided that the EIRP limit for Non-AAS transmitters is applied per-antenna to align with ECC Decision (05)05.
- b. We support the ACMA’s proposed (spurious) emission limits outside 2490–2800 MHz.
- c. As per the TLG, we can agree to the ACMA’s proposed (non-spurious) emission limits in 2615–2620 MHz, on the proviso that they can be reviewed to align with ECC Decision (05)05 as part of the ESL process in 2027.
- d. As per the TLG, we can agree to the ACMA’s proposed (non-spurious) emission limits in 2690–2700 MHz, on the proviso that (i) the EIRP limit for Non-AAS transmitters is applied per antenna to align with ECC Decision (05)05, and (ii) they can be reviewed to better align with 3GPP as part of the ESL process in 2027.
- e. As per the TLG, we can agree to the ACMA’s proposed (spurious) emission limits in 2700–2800 MHz, on the proviso that they can be reviewed to better align with 3GPP as part of the ESL process in 2027.

5. **Unwanted emission limits for upper band (UE) receivers:** AMTA supports the unwanted emission limits applicable to upper-band receivers as proposed in Table 11, except that the applicable frequency range (i.e. “outside 2490–2700 MHz”) may need reviewing or removing altogether.

6. **Unwanted emission limits for lower band transmitters:** AMTA supports the unwanted emission limits specified in Tables 12 and 13. However, in Table 12, the term “max(Channel BW, 5)” in the bottom row of that table, needs to be changed to “max(Channel BW, 6)”.

7. **Unwanted emission limits for upper band (UE) receivers:** AMTA supports the receiver spurious emission limits proposed in Tables 14, 15 and 16.

8. **Provisions for wideband amplifiers:** AMTA is largely supportive of the proposed provisions, but has identified a few gaps that need to be addressed.



I. Scope of the Q4 2025 TLG and 2026 consultation paper

As alluded to in the Introduction to the consultation paper, the 2.5 GHz Technical Liaison Group (TLG) was focused on changes to the spectrum licence core conditions—in-band (or “out-of-area” emission limits) and unwanted emission limits—as well as the registration exemption requirements. In the initial meeting of the TLG, the ACMA made it clear that the objective of the TLG was to consider targeted changes necessary to facilitate 5G NR, including AAS, rather than on a comprehensive review of the 2.5 GHz spectrum licence technical framework (SLTF). As such, it presented its position up-front that major changes—i.e. those that would require detailed consideration of the impact on other services—would not be considered. Rather, more significant changes would have to be addressed as part of the expiring spectrum licences (ESL) process. The ACMA appears to have stayed true to that position, and in a number of places in the consultation paper, mentions that review of certain aspects of the 2.5 GHz SLTF could be considered as part of the ESL process, which the ACMA proposes to commence in Q1 2027.

AMTA notes that there is a relatively short period between the proposed commencement of the 2.5 GHz SLTF review in Q1 2027 and the September 2027 licence re-application period, by which the SLTF need to be finalised. We respect the ACMA’s request for additional issues to be delayed until the Q1 2027 consultation on the renewed SLTF. However, we believe it would be beneficial to address as many issues as possible under this consultation process so that the 2027 process is not unnecessarily overloaded.

For completeness, we acknowledge one exception to the limited scope of the TLG introduced above: the consideration of coordination requirements for 2.5 GHz base station transmitters with S-band radars in 2700–2900 MHz. This was only considered because (a) it was raised by the Bureau of Meteorology (BoM), and (b) it was a matter of presenting existing arrangements more clearly and consistently rather than performing any significant review or change of existing requirements. The review solicited by the BoM is proposed to be addressed by the draft variation to the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters - 2.5 GHz Band) 2023* (“the Tx RAG”), and AMTA supports the proposed changes, which were agreed to between mobile industry representatives and the BoM in the TLG.

We note that of the changes to unwanted emission limits proposed by the ACMA, some were supported by the mobile industry, others were only accepted as interim arrangements on the proviso that a more comprehensive review would be undertaken in the future, and some were not agreed to by the mobile industry. While this is



acknowledged to a degree on page 4 of the consultation paper, the drafting of certain proposals—particularly Proposals 1, 3 and 5—could be interpreted as suggesting that they reflect agreed TLG positions. In AMTA's view, this does not accurately characterise the outcome of the TLG process, as the ACMA ultimately adopted its preferred approach on a number of matters notwithstanding industry concerns or alternative positions raised during consultation.

II. In-band emission limits

We note that the existing in-band (or “out-of-area” (OOA)) limit of 45 dBm/30kHz EIRP is defined in the direction of the horizontal plane. As a result, a base station employing electrical or mechanical downtilt could well exceed this EIRP limit at present while remaining compliant with the existing framework. On the other hand, the derivation of the +50.2 dBm/MHz limit proposed by the ACMA, relies on the main beam antenna gain of 17 dBi being in the direction of the horizontal plane—an overestimation of gain in the vast majority of cases². On this basis, we consider it entirely reasonable for the TRP limit to be slightly increased from +50.2 dBm/5MHz to +53 dBm/5MHz, in line with the lower end of ECC Decision (05)05.

We also note that there is an additional condition in the *Radiocommunications (Unacceptable Levels of Interference – 2.5 GHz Band) Determination 2023* (“the ULOI Determination”) which limits emissions “above the horizontal plane”. Given the proposed move away from an OOA limit specified as horizontally radiated power (HRP) in the spectrum licence core condition, the rationale for retaining a separate emission limit “above the horizontal plane” in the ULOI Determination is unclear and warrants further consideration.

² While almost all of Optus' and Telstra's 2.5 GHz registrations in the ACMA's RRL are registered with 0-degree tilt values, the vast majority of BS in their networks employ downtilt in practice.



III. Unwanted emission limits for upper-band transmitters

3.1 Transmitter unwanted emission limits falling within 2620–2690 MHz

The ACMA is proposing to adopt 3GPP TS 38.104 Category B Option 1 for the in-band limits, with the limits for Non-AAS transmitters defined as conducted power per antenna port, and for AAS transmitters as TRP (including the 9 dB AAS margin). **AMTA supports the unwanted emission limits proposed in Tables 1 and 2 of the consultation paper.**

However, the “– 0.05” term should be removed from Table 1 of the consultation paper; see section 9.3 of this response.

3.2 Transmitter unwanted emission limits falling within 2690–2700 MHz

In the late-2025 TLG, the 2690–2700 MHz range was considered a transition region between in-band limits below 2690 MHz and the stringent unwanted emission limit of –45 dBm/MHz [EIRP] above 2700 MHz. The ACMA considered that because the emission limits need to roll off to the stringent limits above 2700 MHz, there was limited justification for relaxing emission limits close to that boundary. However, the ACMA was willing to consider targeted relaxations closer to 2690 MHz where necessary to accommodate operator and equipment capabilities. As such, it proposed aligning with 3GPP Cat B Option 1 for the first 1 MHz above 2690 MHz, followed by a gradual transition (slope) from the 3GPP limit at 2691 MHz to the equivalent level of the existing limits at a specified breakpoint. The breakpoint was initially proposed at 2695 MHz in October 2025, but was subsequently revised to 2693 MHz during the ACMA’s first review in December 2025, following consultation with an equipment vendor.

As per the TLG, AMTA can accept the ACMA’s proposal in Tables 3 and 4 for the interim period. However, we request that another review as part of the ESL process to consider further relaxations that better align with 3GPP or ECC Decision (05)05. The impact on other services is addressed below under section 7.3 on Radio astronomy.



3.3 Transmitter unwanted emission limits falling within 2615–2620 MHz

3.3.1 Background to the ACMA's proposed limits

As for the 2690–2700 MHz range discussed in the previous section, the ACMA considered relaxation of the existing limits only where these were required to meet the needs of operators and vendors, and primarily in frequency ranges close to the operating band. This was particularly relevant, noting that this 5 MHz range overlaps the 2.5 GHz Mid Band Gap (MBG) spectrum licences. As such, the ACMA agreed to a relaxation to 3GPP Cat B Option 1 for the first 1 MHz below 2620 MHz, followed by a gradual slope from the 3GPP limit at 2619 MHz to the equivalent level of the existing limits at a specified breakpoint. As per the previous section, this breakpoint was initially proposed to be 2615 MHz, but was subsequently revised to 2617 MHz.

In 2615–2619 MHz, the existing limit is +4 dBm EIRP per MHz, which aligns with the BS baseline requirement for Non-AAS transmitters (per-antenna) in ECC Decision (05)05. We note that this is in turn equivalent to the -13 dBm/MHz conducted power level per-port in Table 5 of the consultation paper (for 2615–2617 MHz), and we acknowledge that the proposed limits in Table 5 are more relaxed than the existing limits and European arrangements.

The addition of the 9 dB AAS margin results in the proposed limit values in Table 6 of the consultation paper. However, these levels are lower than the BS baseline requirement for AAS transmitters in ECC Decision (05)05 for offsets greater than 1.73 MHz from the 2615 MHz frequency edge. For offsets between 3 and 5 MHz from the 2615 MHz frequency edge, the proposed limit is 18 dB more stringent than European arrangements, although we acknowledge that the European limits drop from +5 dBm/MHz above 2615 MHz to -52 dBm/MHz below 2615 MHz—a 57 dB step change.

3.3.2 AMTA position on preferred limits for 2615–2620 MHz

The common element of the above changes is that the ACMA's proposed limits focus on affording higher unwanted emissions close to the operating band edge to allow for easier roll-off from high in-band emission levels. This is a technically sound and welcome principle for the ACMA to adopt. However, in practice this still means that there are bespoke arrangements for Australia which cause unnecessary complexity and costs in verifying domestically. In this regard, AMTA submits that it is preferable to have greater alignment with ECC Decision (05)05 as part of the future ESL process:

- a) -13 dBm/MHz conducted power per port;
- b) +5 dBm/MHz TRP.

Such a change would involve a relaxation (of up to 9 dB relative to the ACMA's proposed limits) for AAS transmitters in 2615–2618.3 MHz, but a tightening for Non-AAS transmitters (of up to 16 dB) in 2617–2620 MHz. The increase in the unwanted emission limits for AAS are balanced by the tightening of unwanted emission limits for



Non-AAS. Furthermore, even though the AAS *limit* would increase from -4 dBm/MHz TRP to +5 dBm/MHz TRP, this does not reflect a realistic increase in the actual *levels* of unwanted emissions, since there is a very stringent limit of -52 dBm/MHz TRP immediately below 2615 MHz. In practice, the unwanted emissions will have had to be rolling off within 2615–2620 MHz to meet the stringent limit below 2615 MHz. Together, this means that overall the interference potential to adjacent-band services is not materially increased. The benefit of specifying these higher limits—even if the actual unwanted emission levels are much lower as they roll-off to 2615 MHz—is that there does not need to be a separate verification/compliance process for bespoke Australian arrangements.

Lastly, unwanted emissions in 2615–2620 MHz do not impact TOB operations below 2615 MHz, and it is our understanding that the use of 8 or 10 MHz channels in the 2.5 GHz MBG would essentially preclude use of 2615–2620 MHz, which effectively becomes a guard band.

In summary: As per the TLG, AMTA can accept the ACMA’s proposal in Tables 5 and 6 for the interim period. However, we request that another review as part of the ESL process consider further relaxations to achieve closer alignment with internationally-harmonised European regulatory arrangements.

3.4 Transmitter unwanted emission limits falling within 2490–2615 MHz and 2700–2800 MHz

The ACMA stated early on in the TLG process that it was not considering a review to the existing limit of -45 dBm/MHz for Non-AAS transmitters, in 2490–2615 MHz and 2700–2800 MHz, due to the potential impact to TOB services in the 2.5 GHz MBG and to S-band radars above 2700 MHz. For AAS transmitters, the ACMA proposed converting the existing EIRP-based limit to a TRP-based limit by subtracting a notional antenna gain of 17 dBi. It further agreed to a slight 1 dB increase to -52 dBm/MHz TRP to align with European standards below 2620 MHz (and with Ofcom’s 2.5 GHz FDD spectrum licence above 2700 MHz).

We note that the 2022 correction of ECC Decision (05)05 clarifies that the EIRP limit of -45 dBm/MHz is *per antenna*, as does Ofcom’s 2.5 GHz FDD spectrum licence³. Therefore, the power limit definition in the second column of Table 7 should be changed to “Radiated maximum true mean power **per antenna** (dBm EIRP)”.

As per the TLG, AMTA can accept the ACMA’s proposal in Tables 7 and 8 for the interim period (provided that the EIRP limit for Non-AAS is applied per antenna).

³ Ofcom Spectrum Access 2.6 GHz Licence issued in Nov. 2022 includes a limit of -45 dBm EIRP **per-antenna** for Non-AAS equipment.



However, we request that another review as part of the ESL process consider further relaxations to better align with 3GPP.

With respect to a future review of these limits, it may be useful to break these up into separate limits for 2490–2615 MHz and for 2700–2800 MHz, reflecting the different scenarios they are intended to address.

- The limits of –45 dBm/MHz EIRP (Non-AAS) and –52 dBm/MHz TRP (AAS) are in ECC Decision (05)05 for the frequency range below 2615 MHz, and are intended to facilitate coexistence between unsynchronised fixed station transmitters and receivers within the same geographical area. This scenario is analogous to the TOB services operating in 2570–2615 MHz, and also serves to protect the BS receivers operating in 2500–2570 MHz.
- By contrast, there is no such limit defined for 2700–2800 MHz in ECC Decision (05)05, although Ofcom's 2.5 GHz licensing framework does include a limit equivalent to the ACMA's (provided it is applied per-antenna). The limits proposed by the ACMA in 2700–2800 MHz are intended to facilitate coexistence with S-band radars (meteorological, aeronautical and Defence), which operate from a limited number of fixed, discrete locations. Effective protection of these radar receivers can therefore be achieved by way of detailed site-specific coordination, rather than imposing stringent unwanted emission limits across all base stations. See below, section 7.2 on Radiodetermination services.

3.5 Transmitter unwanted emission limits falling outside 2490–2800 MHz

These are the spurious emission limits, which align with 3GPP for Non-AAS transmitters as conducted power per port, with an additional 9 dB margin and conversion to TRP for AAS transmitters. **AMTA supports the spurious emission limits proposed in Tables 9 and 10.**



IV. Unwanted emission limits for lower-band transmitters and for receivers

4.1 Lower band (UE) transmitter limits

For lower band transmitters—namely, user equipment (UEs) operating in 2500–2570 MHz—**AMTA supports the ACMA’s proposed limits in Tables 12 and 13**, which align with Tables 6.5.2.2-1 and 6.5.3.1-2 of 3GPP TS 38.101-1, respectively⁴. However, in Table 12, the term “max(Channel BW, 5)” in the bottom row of that table, **needs to be corrected to “max(Channel BW, 6)”**.

4.2 Upper band (UE) receiver limits

Noting that UEs receive in the 2.5 GHz upper band (2620–2690 MHz), we understand that the limits applicable to upper band receivers, as proposed in Table 11 of the consultation paper, are intended to apply to UE receivers. **We support the proposed limits in Table 11**, which align with Table 7.9-1 of 3GPP TS 38.101-1. However, it is unclear whether these limits only apply to outside 2490–2700 MHz as proposed, or to the entire range 1–12.75 GHz, noting that Section 7.9 of the 3GPP TS 38.101-1 does not specify any frequency range limitation.

4.3 Lower band (BS) receiver limits

Noting that BS receive in the 2.5 GHz lower band (2500–2570 MHz), we note that the limits applicable to lower band receivers, as proposed in Tables 14 through 16 of the consultation paper, are intended to apply to BS receivers. **We support the receiver spurious emission limits proposed in Tables 14, 15 and 16.**

Table 14 aligns with Table 7.6.2-1 of 3GPP 38.104. In cases where the BS receiver is a Non-AAS receiver connected to the Tx array, or is an AAS receiver, then the transmitter emission limits should apply. This is consistent with the comment in Section 7.6 of 3GPP TS 38.104: *“For antenna connectors / TAB connectors supporting both RX and TX in FDD, the RX spurious emissions requirements are superseded by the TX spurious emissions requirements”*, and we confirm that Tables 15 and 16 are indeed consistent with the applicable BS spurious emission limits.

We note that on page 16 of the consultation paper, in the first paragraph under the heading “Lower 2.5 GHz band receiver unwanted emissions”, this paragraph should refer to 3GPP TS 38.104, and not 38.101-1

⁴ The exception is that the existing limit level of -19 dBm EIRP (converted to TRP assuming 0 dBi gain) is maintained, instead of the -25 dBm level in 3GPP.



V. Registration exemption requirements

Another important aspect of any spectrum licence conditions are the statutory conditions, including the requirements for exemption from device registration (the “registration exemption requirements”). While the consultation paper does not address the registration exemption requirements, the TLG Paper states that “*the devices exempt from registration criteria will not be amended*”. Our understanding is that the existing registration exemption limit is 35 dBm EIRP per 5MHz, and we support that this will be the registration exemption requirement that persists in the updated SLTF.

VI. Provisions for wideband amplifiers

In the ACMA’s consultation on the *Technical framework for renewed 850 MHz and 1800 MHz band spectrum licences*, the ACMA proposed a draft provision for wideband amplifiers which allowed for—where the same licensee holds two spectrum licences—the spurious emission limits applicable to one licence to be exceeded, in respect of operation within frequency bands authorised set out in the other licence, while continuing to require compliance with the unwanted emission limits applicable to that other licence. In its response to that consultation, AMTA made a number of suggestions:

1. that the provisions be extended to cases where the spectrum licences are held by different licensees, but the licensees agree to the exceedance;
2. that the provisions not be limited to scenarios only when the transmitter is actively transmitting/operating in both bands;
3. and additional clarifications that emission limits for UEs are not applicable to wideband amplifiers on base stations.

The ACMA has since published sample licences for the 850 MHz and 1800 MHz bands, including changes intended to address AMTA’s comments summarised above. Point #1 above was addressed by inclusion of clause (b)(ii) which refers to a written agreement. Point #2 above was addressed by the removal of a previously proposed clause, although the ACMA added in an additional safeguard via Note 3, which clarifies that “authorised to operate” means having complied with any relevant registration (and coordination) requirements.

To address Point #3 above, the ACMA has added Note 1 which includes the clarification that “*For the purposes of paragraph (c), the applicable unwanted emission limits in the other licence are those that apply to the particular frequency range that the transmitter is operating in*”.



Clause (d) also states the main aim of these provisions, which is that the transmitter “may exceed the [spurious] unwanted emission limits described in Core Conditions X and Y of this spectrum licence **in respect of operation in frequency bands set out in the other licence**” and in Note 2 reinforces that “the purpose of paragraph (d) is to allow the radiocommunications transmitter to exceed the [spurious] unwanted emissions limits in Core Conditions X and Y **within the frequency bands authorised by the other licence**”.

In the 2.5 GHz consultation paper, the ACMA has proposed text for the provision for wideband amplifiers—which would be applied to 2.5 GHz spectrum licences—that is identical to the corresponding provision in the sample licences for the 850 MHz and 1800 MHz bands. We note the ACMA’s statement in the 2.5 GHz consultation paper that “As this condition has been subject to previous rounds of public consultation, we are of the view that it is fit-for-purpose”. However, we wish to clarify that the final version of the wideband amplifiers provision, that ended up on the 850 MHz and 1800 MHz sample licences, was released after the conclusion of the consultation process and differs significantly from the original draft text on which stakeholders were consulted. Therefore, we do not consider it entirely accurate to suggest that the exact text of these provisions has itself been subject to public consultation.

With this in mind, we wish to make the following observations regarding the proposed wideband amplifier provision as set out in the 850 MHz and 1800 MHz sample licences and now in the 2.5 GHz consultation paper:

- We believe that the provision largely fulfils the goal that both the ACMA and industry want to achieve (i.e. to be able to exceed spurious emission limits, applicable to Band A, in the frequency range overlapping and immediately adjacent to Band B).
- However, the accompanying explanatory notes are difficult to interpret and may not clearly convey the intended outcome to a reader who is unfamiliar with the background to the development of the provision.
- In this regard, we are concerned that the wording in Note 2 “*within the frequency bands authorised by the other licence*” is open to multiple interpretations. For example, it could be interpreted as referring to:
 - the specific frequencies authorised under an individual spectrum licence (e.g. 2110–2125 MHz held by a particular 2 GHz spectrum licensee in a specific capital city);
 - the broader operating band or the spectrum-licensed band (e.g. 2110–2170 MHz in the case of 2 GHz spectrum licences); or
 - the frequency range for which non-spurious emission limits are specified for base station transmitters on the other licence (e.g. 2100–2180 MHz in accordance with the typical 3GPP specification of the “in-band” domain).



- Our view is that the term “*within the frequency bands authorised by the other licence*” is actually intended to be the operating band for base stations authorised by the other licence, including the immediately surrounding spectrum to account for the non-spurious emission limits applicable to the other licence (e.g. +/- 10 MHz either side).
- To exemplify our concern, the existing 2 GHz spectrum licences specify non-spurious emission limits of -11 dBm/MHz EIRP, for offsets greater than or equal to 10 MHz from the 2110–2170 MHz operating band, but without any limiting frequency range to which those limits apply. It is therefore not entirely clear where the breakpoint is between (i) frequencies at which 1800 MHz spurious emission limits apply, and (ii) frequencies at which the 2 GHz spectrum licence limit of -11 dBm/MHz EIRP applies.
- Furthermore, referring to applicable frequency bands does not fully address our concerns in Point #3 above. For example, a base station in a TDD band is authorised to operate in a particular frequency band, but that same frequency band is also used by the UEs. Our suggestion in the response to the 850 & 1800 MHz bands consultation was to clearly state that the emission limits applicable to UEs do not apply.
- Finally, we recommend replacing the phrase “*the transmitter is operating in*” at the end of Note 1 with “*the transmitter is authorised to operate in*”, to align with the wording of clause (a) and to continue to address AMTA’s Point #2 above.



VII. Tx RAG

7.1 Coordination requirements with S-band radars

During the 2025 TLG, the Bureau of Meteorology (BoM) requested a review of the coordination requirements between spectrum licensed transmitters and radiolocation (RLS) receivers operating in the 2700–2900 MHz band. The proposal was discussed extensively within the TLG, and an agreement was reached on the protection criterion that should be reflected in the Tx RAG: namely, that unwanted emissions from 2.5 GHz transmitters should not exceed a maximum unwanted signal received level of -119 dBm/MHz at the input connector of a fixed RLS receiver. This has been adequately reflected in the *Radiocommunications Advisory Guidelines (Managing Interference from Spectrum Licensed Transmitters – 2.5 GHz Band) Variation 2026 (No. 1)*, and **AMTA supports the proposed variation to the Tx RAG.**

7.2 Impact of relaxed unwanted emission limits on S-band radars

Noting that 2.5 GHz spectrum licensed base station transmitters are required to coordinate with licensed radiodetermination receivers above 2700 MHz, **we believe that the unwanted emissions limits falling within 2700–2800 MHz could be increased all the way up to align with 3GPP spurious emission limits.** We disagree with the application of stringent emission limits being applied (in 2700–2800 MHz) to all 2.5 GHz BS transmitters, of which there are thousands across the country, for the purpose of protecting radars in 2700–2900 MHz, of which there are less than 50 installations.

This requested relaxation would not have an undue impact on existing radiodetermination services, since (a) any existing deployed transmitters would be compliant with the existing (more stringent) emission limits, and (b) any new or modified transmitters would need to be registered and be subject to coordination requirements in the Tx RAG, with respect to these radiodetermination services. Where the higher unwanted emission levels that we are proposing would prevent successful registration of the transmitters (due to the coordination requirements of the Tx RAG not being satisfied), spectrum licensees (and their Accredited Persons, APs) would be able to take into account more realistic emission levels radiated by the transmitters, and/or implement mitigation measures to intentionally reduce them to a satisfactory level (i.e. which would ensure that the coordination requirements in the Tx RAG are satisfied).

The only possible risk is that a spectrum licensee could make a change to the transmitter that does not strictly require them to re-register, e.g. removal of filtering (either physical filter or software constraint). If this is indeed a concern, then **two sets of unwanted emissions could be specified: (i) the TLG-agreed limits applying to transmitters registered before the new licence start date; and (ii) 3GPP spurious**



emission limits applying to any transmitters registered after the new licence start date.

7.3 Impact of relaxed unwanted emission limits on RAS receivers

Noting the comments on page 21 of the consultation paper, AMTA agrees that the only substantive change with the potential to affect the radio astronomy service (RAS) is in the range 2690–2700 MHz, where proposed limits are higher than currently permitted. We agree with the ACMA’s conclusion that this is unlikely to create any practical issues, given that spectrum licensees must continue to comply with coordination requirements applicable to RAS facilities. The requirements include the protection criteria specified in Recommendation ITU-R RA. 769-2 for receivers in 2690–2700 MHz, including those at Parkes and Narrabri.

With this in mind, **we believe that the unwanted emissions limits falling within 2690–2700 MHz could be increased all the way up to align with 3GPP Category B Option 1 limits.** We disagree with the application of stringent emission limits being applied (in 2690–2700 MHz) to all 2.5 GHz BS transmitters, of which there are thousands across the country, for the purpose of protecting just **two** licensed RAS facilities.

The comments made in the third paragraph of the previous section above (section 7.2) also apply to the range 2690–2700 MHz, but with respect to the RAS receivers at Parkes and Narrabri (instead of to radar receivers).

As per the previous section above, the only possible risk is that a spectrum licensee could make a change to the transmitter that does not strictly require them to re-register. If this is indeed a concern, then **two sets of unwanted emissions could be specified: (i) the TLG-agreed limits applying to transmitters registered before the new licence start date; and (ii) 3GPP Category B Option 1 limits applying to any transmitters registered after the new licence start date.**



VIII. Notional receiver performance levels in the Rx RAG

8.1 Correction to frequency offsets

As part of the finalisation of the TLG process in March 2026, AMTA identified a few corrections that should be made to the notional receiver performance requirements in Schedule 1 of the *Radiocommunications Advisory Guidelines (Managing Interference to Spectrum Licensed Receivers – 2.5 GHz Band) 2023* (“the Rx RAG”).

Specifically:

- the adjacent channel selectivity (ACS) requirement of 43.5 dB should apply for frequency offsets of **less than 5 MHz** (rather than “equal to or less than 5 MHz”) from the upper or lower frequency limits of the relevant spectrum licence;
- the ACS requirement of 85 dB should apply for frequency offsets of **greater than or equal to 5 MHz** (not “greater than 5 MHz”) from the upper or lower frequency limits of the relevant spectrum licence; and
- the receiver blocking requirement of -18 dBm/MHz should apply for frequency offsets **greater than or equal to 10 MHz** (not “greater than 10 MHz”) from the upper or lower frequency limits of the relevant spectrum licence.

Noting the ACMA’s comment on pg 5 of the consultation paper, “*When reviewing a spectrum licence technical framework, the effect any changes may have on other spectrum uses and users needs to be considered. While an aim of this review is to maximise the potential of the technical framework for spectrum-licensed services, coexistence and the spectrum utility of other spectrum uses and users are also key objectives.*”, AMTA considers that these corrections are entirely consistent with that objective.

The proposed corrections to the Rx RAG effectively tighten the notional receiver performance assumptions used in coordination assessments. They do not impose any additional obligations on spectrum licensees—who all agree to the change—and at the same time, *would facilitate coordination by* other spectrum users seeking to demonstrate compatibility with spectrum-licensed receivers, thereby improving regulatory certainty and enhancing protection outcomes. **As such, there is no negative impact to other users, and we see no reason not to make this correction (or to delay it to the future 2027 process).**



XI. Other matters not previously considered in the TLG

9.1 Definition of EIRP

The ACMA offers some definitions on pages 7 and 8 of the consultation paper, including:

“The term ‘radiated maximum true mean power’ is taken to mean the maximum EIRP of a device on a particular azimuth and elevation. It is the result of a measurement of the combination of all radiating elements of an antenna panel or individual device.”

AMTA considers that the second sentence of this definition is inaccurate and should be removed: EIRP is conducted power plus antenna gain, it is not a ‘measurement’ (unlike TRP). Specifically, it is the power level that would have to be transmitted by an isotropic (omni) antenna to provide the same amount of signal strength—in the particular direction of interest (including in the direction of maximum radiation)—as the (directional) antenna of interest.

Furthermore, only one EIRP-based limit is proposed for the SLTF: -45 dBm/MHz for 2490–2615 MHz and 2700–2800 MHz. As mentioned earlier, the corresponding limit in ECC Decision (05)05 is specified as **EIRP per antenna (i.e. conducted power per antenna port plus antenna gain)**. AMTA therefore considers that this distinction should be explicitly reflected in the limit currently proposed in Table 7 of the consultation paper to ensure consistency with the underlying European framework and to avoid ambiguity regarding the basis on which compliance is assessed.

9.2 Terms ‘spurious’ and ‘non-spurious’

We note that the ACMA proposes to remove the terms ‘spurious’ and ‘non-spurious’ from 2.5 GHz band spectrum licences for consistency with spectrum licences issued in other bands. Under the proposed framework, unwanted emission limits would instead be specified directly for particular frequency ranges. AMTA acknowledges that this change was introduced for valid reasons several years ago and supports the current licence drafting approach, whereby applicable unwanted emission limits are specified directly. However, the removal of the terms ‘spurious’ and ‘non-spurious’ has made it more difficult to refer to and distinguish between different categories of emission limits in consultation processes and technical discussions. As these terms remain well understood across industry, we recommend that the ACMA continue to use them as convenient shorthand in consultation papers and explanatory materials, while maintaining the current drafting approach in the licence conditions themselves.



9.3 Erroneous term “-0.05” in Tables 2 through 6

In Table 1 of the consultation paper, the ACMA has included the term “-0.05” after the frequency offset, which the ACMA has defined as “ f_{offset} ”: the frequency offset from the licensed block edge to the nearest -3dB point of the measurement filter, as clearly stated in the Note to Table 1 of the consultation paper. This definition of frequency offset aligns with 3GPP’s term “ Δf ”. In 3GPP, the addition of “-0.05” is only used with “ f_{offset} ”, which is defined in 3GPP as “*Frequency offset of measurement filter centre frequency*”. As the ACMA’s definition of f_{offset} already references the -3dB point of the measurement filter, this adjustment has effectively already been accounted for. Therefore, there is no need to include the term “-0.05”.

Accordingly, AMTA considers that the term “-0.05” should be removed from Tables 2 through 6 of the consultation paper to ensure consistency with the definition of f_{offset} provided in Table 1.

9.4 Review to remove consideration of TDD arrangements in the Rx RAG

Upon reviewing the current notional receiver performance levels in Schedule 1 of the Rx RAG, AMTA notes that the 2.5 GHz band adopts significantly more stringent receiver assumptions than those applied in other FDD bands. In particular, the current framework includes:

- an ACS level of 85 dB for 5-10 MHz frequency offsets; and
- an in-band blocking requirement of -18 dBm/MHz for frequency offsets of 10 MHz or greater.

For comparison, 3GPP receiver specifications for in-band interfering signals are substantially less stringent. For signals falling within the 2480-2590 MHz range (i.e. the “in-band” range defined in Table 7.4.2.2-0 of 3GPP TS 38.104), 3GPP only requires the ability to tolerate an interfering signal of up to -43 dBm for a 5 MHz interferer that is 2nd adjacent channel from the receiver (or around 60 dB above the compatibility requirement), as per Table 7.4.2.2-1 of 38.104.

This means that the current notional receiver performance levels adopted in the Rx RAG, within 2480-2590 MHz and for offsets of greater than or equal to 5 MHz are approximately 25 dB more stringent than 3GPP. The TLG Paper of 2012⁵ explains that the ACMA’s intention was to base the receiver performance requirements on those assumed in the development of the block edge mask (BEM) in CEPT Report 19 and discussed in ECC Report 119. The 2012 TLG Paper goes on to explain that ECC Report

⁵ ACMA, 2012, *Technical Framework Development—2.5 GHz Spectrum Licence Band—TLG-Discussion Paper No. 3*, available here: <https://www.acma.gov.au/publications/2012-01/report/25-ghz-tlg-package-2012>



119 examines the compatibility of FDD and TDD systems. The European BEM uses an ACS level of 46 dB in the first adjacent 5 MHz channel, which is why the ACMA aligned the ACS requirement (for 0–5MHz offset) with 3GPP. Note that the ACMA sought to ensure at least 5 MHz guard band between adjacent spectrum licensees via the definition of ‘restricted blocks’ at the licence edges. ECC Report 119 also found that additional base station receiver filtering would be required to protect the receiver from high level signals from possible BS transmitters in the 2nd adjacent channel, i.e. 5–10MHz offset, and derived a required ACS value of 99 dB. The ACMA derived its own value using a typical BS EIRP level of 39 dBm/30kHz (i.e. 6 dB lower than the legal in-band limit), 200m separation (within which it is considered a site management issue) and 14 dBi BS rx gain in the direction of the horizontal plane. 39 dBm/30kHz is equivalent to 54 dBm/MHz and the free-space loss (FSL) over 200 metres at 2.5 GHz is 86.5 dB. As such:

$$54 \text{ dBm/MHz} - 86.5 \text{ dB} + 14 \text{ dBi} = -18.5 \text{ dBm/MHz}$$

... which is the value of the in-band blocking requirement, for offsets greater than or equal to 10 MHz, adopted by the ACMA in 2012. The same threshold was used for the “ACS” requirement for 5–10 MHz offsets, except that the ACMA calculated the difference between this threshold and the figure of –103.5 dBm/MHz: 85 dB.

While ACS in the first-adjacent channel, and out-of-band blocking for interfering signals outside of 2480–2590 MHz, are consistent with 3GPP TS 38.104, AMTA considers there is a strong justification for revisiting the more stringent ACS requirement for 5–10MHz offset, as well as the in-band blocking requirement. The primary reason is that these stringent requirements were intended to facilitate coexistence between FDD and TDD in the band. To date, this has not materialised, and out of 48,000 device registrations in the 2.5 GHz lower band, there is only one low power transmitter registered. Furthermore, the harmonised spectrum scheme for mobile & fixed communications networks (MFCN) in Europe⁶ is based on FDD only, with TDD systems limited to the mid-band gap (currently used for TOB services in Australia). As such, the receiver performance requirements should be revised to reflect the FDD planning arrangements of the band, and at a minimum, **receiver performance within 2500–2570 MHz—for offsets greater than or equal to 5 MHz—should align with 3GPP in-band blocking requirements.**

Since these proposed changes are contained within 2500–2570 MHz, there are no other affected users other than 2.5 GHz spectrum licensees, who all agree to the requested amendment. **As such, there is no negative impact to other users, and we see no reason not to make this correction (or to delay it to the future 2027 process).**

⁶ ECC, corrected March 2022, ECC Decision (05)05—*Harmonised utilization of spectrum for Mobile/Fixed Communications Networks (MFCN) operating in the band 2500–2690 MHz*, available here: <https://docdb.cept.org/download/1664>



As part of the 2027 review of the 2.5 GHz SLTF under the ESL process, additional requirements could be considered for 2480-2500 MHz to consider coexistence with from ISM/LIPD devices (and potentially from MSS downlinks) and/or for 2570-2590 MHz (from TOB service transmitters).

