

**Ericsson submission to the Australian
Communications and Media Authority's
Proposal to remake instruments for the
2.3 GHz spectrum-licensed band
Consultation paper**

October 2023

Introduction

- Ericsson welcomes the opportunity to respond to the Australian Communication and Media Authority's (ACMA's) Proposal to remake instruments for the 2.3 GHz spectrum-licensed band consultation paper (**Consultation**)
- We appreciate the ACMA engaging with spectrum licence holders and equipment suppliers to assess whether technical frameworks remain aligned and relevant to current and emerging technology use in specific bands.
- In summary Ericsson:
 - Supports the proposal to remake the instruments for the 2.3GHz Spectrum Licenced band.
 - Agrees with the concept of a common document (Interpretation - Technical Framework) that will eventually apply to all Spectrum Licenced bands.
 - Suggests that this is the best time to fully align with 3GPP emissions standards with respect to testing standards and measurement confidence.
 - Recommend that the Definitions used are updated, where appropriate, to reflect the technologies used in the Spectrum Licenced bands.

5G market update

- Provided below are key findings from the June 2023 Ericsson Mobility Report¹ that track the actual and forecast growth of mobile broadband. These findings are given to emphasise the growth in IMT and how critical it is that Spectrum Licenced bands reflect the 3GPP technologies standards used to make the most efficient use of spectrum.
 - mobile network data traffic growth of 36 percent between Q1 2022 and Q1 2023 - driven by rising smartphone subscriptions and increasing average data volume per subscription, fuelled primarily by increased viewing of video content.
 - the global deployment of 240 live 5G networks, with 35 per cent population coverage at the end of 2022, projected to reach 85 per cent in 2028.
 - 5G mobile subscriptions set to reach 1.5 billion globally by the end of 2023 and 4.6 billion by the end of 2028.
 - monthly global average usage per smartphone is expected to exceed 20 GB at the end of 2023 and forecast to reach 47 GB in 2028.

¹ [Ericsson Mobility Report June 2023](#)

ACMA requirements vs 3GPP standards

- In the proposed ACMA document *"Radiocommunications (Interpretation – Technical Framework) Determination 2023"*, section 6 (Accuracy), states *"Unless otherwise specified, the value of a parameter in Schedule 2 must be estimated with a level of confidence not less than 95 percent that the true value of the parameter will always remain below the requirement specified in this instrument."*
- Ericsson agrees with a 95% confidence level as is stated in 3GPP 37.141 section 4.1.2, *"All tolerances and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated."* and *"A confidence level of 95% is the measurement uncertainty tolerance interval for a specific measurement that contains 95% of the performance of a population of test equipment."*
- Where 3GPP differs to ACMA requirements is in how this 95% confidence is applied. 3GPP 37-141 section 4.1.1 states *"Test Tolerances are individually calculated for each test. The Test Tolerances are used to relax the minimum requirements to create test requirements."*
- This results in Operating Band Unwanted Emissions being relaxed by 1.5dB to ensure 95% confidence as is stated in 3GPP 37.141 Annex C. This is then reflected in 3GPP 37.141 Table 6.6.2.5.2-2b (WA BS OBUE in BC2 bands > 1 GHz - option 1)
- Ericsson strongly recommends that ACMA align with 3GPP standards and the definition and application for 95% confidence.
- To further support this point, in 2018 the ACMA 2.3GHz Spectrum Licences for Telstra stated *"(a) the value of a parameter in Licence Schedules 2 and 3 must be estimated with a level of confidence not less than 95% that the true value of the parameter will always remain below the requirement specified plus 2dB;"*
- The "plus 2dB" stated in 2018 allowed for measurement uncertainty in a similar way to how 3GPP reaches 95% confidence level.
- The removal of the "plus 2dB" during the 2.3GHz TLG was not directly discussed.
- With the new structure for technical framework instruments being proposed by ACMA, Ericsson believes this is the appropriate time to align ACMA and 3GPP definitions and standards before any future bands begin to point to this new structure of documents.

Definition updates

- The definitions provided in Schedule 1 of the Proposed "Radiocommunications (Interpretation – Technical Framework) Determination 2023" are an accumulation of definitions over a long period of time.
- While some definitions have been added in the past few years to accommodate, for example, AAS devices, other definitions appeared more than 20 years ago.
- Ericsson suggests if a new "Radiocommunications (Interpretation – Technical Framework) Determination 2023" is proposed to be used in the future, then these definitions need to be reviewed now.
- A review of the definitions could determine:
 - if they are still used in ACMA documents.
 - are written in a way that is easy to understand.
 - are written with respect of current and future technologies.
 - align with international standards.
 - how they could better provide guidance on their intended purpose and should be tested.
- Examples of this could be:
 - With reference to "mean power", how does 10 times the period of the lowest modulation frequency apply in 4G, 5G and 6G, and is there any difference for TDD formats?
 - Are the definitions of "in-band" and "out-of-band" defined the best way when 3GPP defines these differently?
 - Is the definition of "horizontally radiated power" suitable for AAS devices that don't have antenna connectors?

The costs of requiring bespoke radio equipment for Australia

- If the 95% confidence level for licence core conditions is not applied in the same way as 3GPP, it can result in inefficient use of spectrum.
- This can be in the form of lower transmit power resulting in smaller coverage area or lower power spectral density resulting in lower modulation orders.
- Alternatively, this can sometimes result in higher digital filtering needs (processing requirements) reflected as a bespoke requirement for Australia, which results in less energy efficient radios.
- The time to align to 3GPP methods and standards is now, before the new technical framework instruments propagates to further spectrum licensed bands.