

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Unlicensed Use of the 6 GHz Band)	ET Docket No. 18-295
)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz)	GN Docket No. 17-183
)	

NOKIA COMMENTS

Nokia submits these Comments and Technical Appendix in Support of the Verizon Petition for Reconsideration¹ seeking power levels for operations subject to automated frequency coordination (AFC) that are higher than those adopted by the Commission in the above-captioned proceeding.² Nokia’s Technical Appendix similarly supports CTIA’s proposal in its Petition for Partial Reconsideration³ seeking higher power levels for operations subject to AFC consistent with the Verizon Petition.

I. BACKGROUND

Nokia has been extremely active in this proceeding, submitting several technical studies and advocating to reach a result that will support new robust unlicensed operations while protecting critical incumbent Fixed Service (FS) use of the band, which is substantial and growing.⁴ As a provider of best in class incumbent FS equipment as well as new high-

¹ Verizon Petition for Reconsideration, GN Docket 18-295 *et al.* (filed June 25, 2020) (“Verizon Petition”).

² *Unlicensed Use of the 6 GHz Band*, Order and Notice of Proposed Rulemaking, GN docket No. 18-295, *et al.*, FCC 20-51 (rel. Apr. 24, 2020) (“*Order*”).

³ CTIA, Petition for Partial Reconsideration, GN Docket 18-295 *et al.*, at 2, 6-8 (filed June 25, 2020) (“CTIA Petition”).

⁴ Comments of Nokia, GN docket No. 18-295, *et al.* (filed June 29, 2020); *see Order*, Appendix E (citing three additional technical studies submitted by Nokia).

performance unlicensed equipment such as Wi-Fi and New Radio (NR-U) in the 6 GHz band,⁵ Nokia is well-positioned to advise the Commission on the technical interference aspects of the new unlicensed service sharing the band with FS.

In these Comments, Nokia provides a Technical Appendix that supports Verizon's proposal to increase the maximum permitted EIRP in the U-NII-5 (5.925-6.425 GHz) and U-NII-7 (6.525- 6.875 GHz) bands from 36 dBm to 42 dBm for the Standard Power Access Point while leaving unchanged the maximum power spectral density (PSD) of 23 dBm/MHz. The CTIA Petition similarly seeks "power levels greater than 36 dBm for AFC-controlled unlicensed devices so long as they are subject to an AFC system capable of protecting incumbent FS users."⁶ Verizon describes its concerns as follows:

The Commission's 36 dBm EIRP limit does not optimize the opportunity to support 5G systems that use bandwidths of 80, 100 or even hundreds of megahertz. A 36 dBm power limit (with a 30 dBm conducted power limit) will unnecessarily relegate wideband systems to coverage areas substantially smaller than those of narrowband systems. In turn, this reduced coverage will make 5G NR-U deployments much more expensive for operators (who will be required to deploy additional small cells to achieve their desired service areas) and potentially less optimal for consumers (should coverage areas be constricted as a result).⁷

Consistent with Nokia's prior advocacy and technical studies, bolstered further by the attached Technical Appendix, Nokia supports more robust technical parameters that facilitate 5G services, subject to an AFC, to optimize use of this valuable spectrum while protecting incumbent FS.

⁵ See *Nokia blends 5G and WiFi 6, while WBA lays claim to 6 GHz band*, Caroline Gabriel (Mar. 16, 2020) available at <https://rethinkresearch.biz/articles/nokia-blends-5g-and-wifi-6-while-wba-lays-claim-to-6-ghz-band/>.

⁶ CTIA Petition at 2.

⁷ Verizon Petition at 4.

II. TECHNICAL ANALYSIS SUPPORTS HIGHER POWER LEVELS AS PROPOSED BY VERIZON

In the attached Technical Appendix, Nokia analyzes the benefits of higher EIRP as proposed by Verizon and CTIA for five deployment scenarios. As the expectation for 5G is to have channel bandwidths larger than 20 MHz, various RF link budget scenarios were considered with regard to the EIRP and PSD EIRP for the Standard Power Access Point. Our study analyzed the five deployment scenarios using two contrasting approaches.

- One approach was to fix the Total EIRP power to 36 dBm independent of channel bandwidth, such that when the channel bandwidth is considered wider than 20 MHz the PSD EIRP proportionally decreases from the 23 dBm/MHz limit. Here, we saw an increase to the channel bandwidth will result in the cell edge not being as spectrally efficient.
- The second approach was to allow the total EIRP to increase but keep the PSD EIRP at 23 dBm/MHz. Increasing the maximum EIRP to reflect an increase of channel bandwidth provided benefit to the cell range or cell edge throughput, dependent on how one wanted to take advantage of the EIRP increase.

Based on this study, we recommend the Commission grant Verizon's Petition to set the Standard Power Access Point maximum EIRP value as 42 dBm, thus allowing for higher EIRP with larger channel bandwidths, while maintaining the 23 dBm/MHz PSD EIRP.

In addition to the benefits described above, increasing maximum EIRP, while maintaining the same PSD EIRP, also maintains channel access fairness among Standard Power Access Points transmitting with similar PSD EIRP under the listen-before-talk mechanism. In case of Standard Power Access Points transmitting with different PSD EIRP levels, potential issues and solutions can be evaluated and reconciled by industry-led standard bodies.

Of critical importance, protection of FS is predicated on a robust AFC mechanism for controlling unlicensed operations. Nokia stands ready to assist industry efforts to develop and test AFC solutions that will effectively protect FS as intended by the Commission's technical framework for the 6 GHz band.

* * * * *

For the foregoing reasons, and as set forth in the Technical Appendix submitted with these Comments, Nokia respectfully requests that the Commission grant Verizon's Petition for Reconsideration to increase the maximum permitted EIRP in the U-NII-5 and U-NII-7 bands from 36 dBm to 42 dBm for the Standard Power Access Point while leaving unchanged the maximum PSD EIRP of 23 dBm/MHz.

Respectfully submitted,

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