Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules	)	RM-11104
For the License-Exempt 57-64 GHz Band	)	
	)	
47 C.F.R. §15.255(b) and § 15.255(i)	)	

REPLY COMMENTS OF THE WIRELESS COMMUNICATIONS ASSOCIATION INTERNATIONAL, INC.

The Wireless Communications Association International, Inc. ("WCA"), by its counsel and pursuant to Section 1.405(b) of the Commission's Rules, hereby submits these reply comments regarding its Petition for Rulemaking in the above-captioned matter, in which WCA has asked the Commission to amend certain Part 15 technical rules relating to operation of wireless facilities in the license-exempt 57-64 GHz band (referred to herein as the "60 GHz band").[1] For the reasons set forth below, the record reaffirms that the public interest would be served by issuance of a *Notice of Proposed Rulemaking* on WCA's Petition as soon as practicable.

Save for a single objection filed by one individual, there is unanimous industry support for WCA's proposal. Indeed, WCA speaks for the most prominent vendors in the 60 GHz space (*e.g.*, Bridgewave Communications, Ceragon, Terabeam), and others as well have voiced enthusiasm about WCA's proposed rule changes.[2] As noted in the separate supporting comments filed by Bridgewave:

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[1] *See* Petition for Rulemaking of Wireless Communications Ass'n Int'l, RM-11104 (filed Sept. 30, 2004)("Petition").

[2] *See* Comments of Yipes Enterprise Services, Inc., RM-11104 (filed Nov. 24, 2004); Comments of CSG Wireless Inc., RM-11104 (filed Nov. 24, 2004).

> The 60 GHz spectrum is unique in offering competitive operators and enterprise users the ability to deploy gigabit capacity outdoor wireless links without the need for spectrum licenses. . . The main limiter to the widespread usage of this valuable spectrum is the limited link distances that can be achieved under the current operating rules. The proposed rules changes will significantly increase the achievable link distances, without causing significant potential for interference between links.[3]

By contrast, the *only* opposition in the record to WCA's proposal is that of Rory Van Tuyl, a project manager for Agilent Technologies filing on his own behalf.[4] WCA wishes to correct certain misunderstandings in Mr. Van Tuyl's comments.

First, contrary to what Mr. Van Tuyl suggests in his filing, the Commission did in fact adopt its Part 15 power density ("PD") limits for the 60 GHz band to ensure that systems in the band comply with relevant RF safety standards.[5] As noted in WCA's Petition, this is made crystal clear in the Commission's 1995 *Report and Order* in which it first allocated the 59-64 GHz band for license-exempt service.[6] Accordingly, the fact that WCA's proposal to add an EIRP-based power limit to Section 15.255(b)(1) will assure compliance with relevant RF safety standards is a pertinent factor which supports a grant of WCA's Petition.[7]

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[3] Comments of Bridgewave Communications, RM-11104 (filed Nov. 18, 2004).

[4] *See* Comments of Rory Van Tuyl, RM-11104 (filed Nov. 29, 2004) ["Van Tuyl Comments"]. While Mr. Van Tuyl acknowledges his association with Agilent, nothing in his comments indicates that he is acting on Agilent's behalf.

[5] *Id.* at 2.

[6] *See* WCA Petition at 8, *quoting Amendment of Parts 2, 15 and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications*, 11 FCC Rcd 4481, 4488 (1995)["*59.64 GHz First Report and Order*"]

[7] As discussed at length in WCA's Petition, the current PD limits in Section 15.255(b)(1) restrict high gain, point-to-point 60 GHz antennas to an artificially low power level with no corresponding benefit to the public. *See id.* at 9. WCA thus has proposed a rule modification that would permit high gain, point-to-point antennas to demonstrate compliance with the relevant RF safety limits by using an EIRP-based alternative to the existing PD limits in Section 15.255(b)(1), under which average EIRP would be limited to 82 dBm less 2 dB for every dB that antenna gain is below 51 dBi. *Id.* at 9-10.

Also incorrect is the suggestion that Section 15.31(f) renders WCA's proposal unnecessary because the rule permits PD measurements in both the near-field and the far-field.[8] The fact that Section 15.31(f) permits far-field measurements is beside the point – the EIRP-based rule change requested by WCA is necessary because (1) Section 15.255(b)(1) imposes PD limits measured in the near-field, (2) as a matter of physics, users of high gain, point-to-point antennas have substantial difficulty obtaining accurate measurements of PD levels in the near-field, and (3) far-field measurements do not provide a reliable approximation of near-field measurements, meaning that 60 GHz users must rely on mathematical formulae to determine what power levels are permissible given the PD limits in Section 15.255(b)(1).[9] Those calculations, in turn, always produce the same result: to guarantee compliance with the PD limits in Section 15.255(b)(1), users of high gain point-to-point 60 GHz antennas must transmit at power levels exponentially below the 27 dBm (500 mW) peak power limit set forth in Section 15.255(e).[10] As shown in WCA's Petition, adding an EIRP limit to Section 15.255(b)(1) will solve this problem.[11]

Furthermore, Mr. Van Tuyl broadly claims that the longer link distances achievable under WCA's proposal will result in correspondingly larger areas of interference.[12] As the Commission

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[8] *See* Van Tuyl Comments at 2.

[9] *See* WCA Petition at 2-3.

[10] *Id.* at 3.

[11] It must be emphasized that WCA's proposal is *not* designed to permit 60 GHz users to operate at absolute power levels higher than those permitted under Part 15. Indeed, WCA makes clear in its Petition that it is not asking the Commission to raise the 27 dBm peak power limit in Section 15.255(e). *See id.* at 12. Rather, WCA's proposed EIRP limit is merely another means of ensuring that users of the 60 GHz band remain in compliance with relevant RF safety standards, regardless of the types of antennas they use. As such, WCA's proposal will aid in the Commission's enforcement of Section 15.255(b)(1), since it will provides the agency with an alternative, more reliable tool for verifying that users of high gain, point-to-point 60 GHz antennas are complying with their RF safety obligations.

[12] *See* Van Tuyl Comments at 3.

has recognized for years, "[a]bsorption and scattering caused by oxygen and water vapor limit the range of millimeter wave transmissions to a few kilometers *almost regardless of the power used*. . . Attenuation caused by oxygen is significant throughout the millimeter wave spectrum, but increases dramatically at frequencies around 60 GHz and 120 GHz."[13] These factors, combined with the extremely narrow beamwidths used at 60 GHz, render it highly unlikely that WCA's proposed EIRP limit will increase the risk of interference to any material extent.[14]

Lastly, Mr. Van Tuyl's comments provide no support for his opposition to WCA's request for clarification that the transmitter ID requirement in Section 15.255(i) does not apply to "window links" (*i.e.,* antennas located indoors but directed outside a window).[15] Although Mr. Van Tuyl claims that non-application of the transmitter ID requirement to window links "sets the stage for interference problems for indoor unlicensed devices," the evidence WCA is aware of indicates that window links effectively function like pure outdoor links beyond the immediate indoor area around the transmitter itself, and should thus be afforded the same exemption from Section 15.255(i)'s transmitter ID requirement.[16] Since 60 GHz signals do not effectively penetrate room walls or partitions, any incremental interference that might result from a user's choice to deploy a window link (versus an outdoor link) will typically be limited to the transmitter's immediate vicinity and, if necessary, can be easily mitigated by the user. In any

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[13] *59-64 GHz First Report and Order*, 11 FCC Rcd at 4484 n.6 (emphasis added).

[14] Mr. Van Tuyl also suggests, again without any technical support, that the longer link distances achievable under WCA's proposal will be of little marginal benefit to users of the 60 GHz band. *See* Van Tuyl Comments, Attachment A. As noted above, WCA speaks on behalf of the leading equipment vendors in the 60 GHz space, and, as reinforced by the supporting comments cited above, they have determined through their own extensive marketplace experience that the benefits of WCA's proposal will be substantial.

[15] *See* Van Tuyl Comments at 4; WCA Petition at 14-15.

[16] *See* WCA Petition at 14 ("Tests of 57-64 GHz link propagation through commercial glass samples confirm that many common window glass types have RF attenuations of as little as 4 dB, even when the

event, any disagreement about this issue should be settled in the context of a formal rulemaking on WCA's Petition, which would provide all interested parties with an opportunity to conduct further tests and submit any relevant technical data that would assist in the Commission's resolution of this issue.

In sum, WCA Petition demonstrates that WCA's proposed rule changes will unleash the license-exempt 60 GHz band's potential as a vehicle for competitive, very high speed Internet service without disrupting Part 15's basic technical framework for the spectrum. WCA's Petition thus fully serves the public interest and warrants the issuance of a *Notice of Proposed Rulemaking* as soon as practicable.

Respectfully submitted,

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radio is aimed at an angle to the glass. This means that in many cases window links offer a practical alternative to roof-mounted antennas.")

CERTIFICATE OF SERVICE

I, Michelle A. Bynum, hereby certify that on the 14th day of December 2004, copies of the foregoing "Reply Comments of the Wireless Communications Association International, Inc." have been served by first class United States mail, postage prepaid, to the following:

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