

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

In the Matter of)	
)	
Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band)	WT Docket No. 07-195
)	
Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz, and 2175-2180 MHz Bands)	WT Docket No. 04-356
)	

COMMENTS OF M2Z NETWORKS, INC.

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COMMENTS OF M2Z NETWORKS, INC.

M2Z Networks, Inc. (“M2Z”) respectfully submits these further comments in response to the Federal Communications Commission (“Commission”) Further Notice of Proposed Rulemaking (“*Further Notice*”)¹ in the above-captioned dockets. The *Further Notice* seeks comment on the Commission’s proposal to combine the 2155-2175 MHz band with the 2175-2180 MHz band to create a contiguous 25 megahertz block of spectrum in a reconfigured AWS-3 band, and additionally seeks comment on various application, licensing, operating, and technical rules for the 2155-2180 MHz band.²

As outlined below, M2Z generally supports the proposals in the *Further Notice*, but recommends the following modifications to the proposed rules outlined therein:

- To avoid limiting consumer choice, the definition of a free service user as proposed in Section 27.1191(b)(3) and (f) should be modified to apply on a per-device basis, so that individual consumers may utilize both free and premium services.

¹ See *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band; Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz, and 2175-2180 MHz Bands*, WT Docket Nos. 07-195 & 04-356, Further Notice of Proposed Rulemaking, FCC 08-158 (rel. June 20, 2008) (“*Further Notice*”).

² *Id.* ¶ 3.

- To avoid regulatory uncertainty, the proposed Section 27.1191(b)(3) should be modified to ensure that any Commission reassessment of the free service data rate requirement is done at license renewal.
- To ensure new nationwide competitive entry, the Commission should limit eligibility to participate in the AWS-3 auction to new entrants.
- To ensure regulatory consistency and usability of the spectrum, the Commission should utilize the “standard” $43 + 10 \log(P)$ out-of-band emissions (“OOBE”) limit.
- In light of the fact that mobile-to-mobile intermodulation interference concerns are not present in the AWS-3 band (unlike the H Block), the power limit for AWS-3 mobile devices should be modified from 23 dBm/MHz to 33 dBm.

M2Z’s suggested modifications to the proposed rules are set out in an Exhibit submitted with these comments.³

INTRODUCTION AND SUMMARY

In the *Further Notice*, the Commission recognized that commenters in these proceedings have already contributed to the development of an “extensive record”⁴ regarding the proposals summarized therein. As a result, the new issues set forth for comment in the *Further Notice* are relatively few in number. M2Z submits these comments to support the adoption of a single 25 megahertz block in the 2155-2180 MHz band and reaffirm its continued support for the Commission’s proposed service rules that: (1) permit downlink and uplink transmissions in the band; (2) create a single nationwide license for the band; (3) require the licensee to provide free, two-way broadband Internet access service generally consistent with the Commission’s data rate and network capacity proposals; (4) require the licensee to provide for open devices and open applications with respect to its premium service and open devices with respect to its free service; (5) set the initial license and renewal terms at ten years; (6) establish network coverage

³ See Exhibit A, attached hereto, for M2Z’s suggested revisions to specific service rules proposed in the *Further Notice*.

⁴ *Further Notice* ¶ 3.

requirements; (7) allow spectrum disaggregation, partitioning, and leasing; (8) resolve mutually exclusive license applications via competitive bidding; and (9) set in-band power and out-of-band emissions (“OOBE”) limits for AWS-3 base and fixed downlink stations.⁵

Although many aspects of the Commission’s proposal are in the public interest, M2Z suggests below certain modifications to the proposed service rules. The purpose of these proposed rule modifications is to allow for a more equitable method of counting free service users, to allow for a more predictable process for reassessing or adjusting minimum engineered network data rates, and to better ensure that the AWS-3 auction will facilitate new market entry. M2Z also does not support the proposal to depart from Commission precedent with regard to AWS-3 mobile device OOBE and in-band power limits. Such departures are not justified by the extensive record in these proceedings, and the proposals should not be adopted on the basis of incumbent licensees’ unfounded claims to unilateral harmful interference protection far beyond what is conventionally required from new and existing spectrum licensees.

M2Z⁶ and many other commenters⁷ have previously voiced their support for the Commission’s adoption of flexible and technologically neutral service and technical rules, as well as service rules requiring the AWS-3 licensee to provide a free, family-friendly two-way

⁵ *See id.*

⁶ *See, e.g.*, Letter from Uzoma C. Onyeije, M2Z, to Ms. Marlene H. Dortch, WT Docket Nos. 07-195 & 04-356 (filed June 3, 2008) (“M2Z June 3 *Ex Parte*”); Letter from Uzoma C. Onyeije, M2Z, to Ms. Marlene H. Dortch, WT Docket No. 07-195 (filed May 5, 2008) (“M2Z May 5 *Ex Parte*”); M2Z Reply Comments, WT Docket No. 07-195, at 13 (filed Jan. 14, 2008) (“M2Z Reply Comments”); M2Z Comments, WT Docket No. 07-195, at 12-13, 38-44 (filed Dec. 14, 2007) (“M2Z Initial Comments”).

⁷ *See, e.g.*, Comments of QUALCOMM Incorporated, WT Docket No. 07-195, at 3-6 (filed Dec. 14, 2007); Reply Comments of Sprint Nextel Corporation, WT Docket No. 07-195, at 2-20 (filed Jan. 14, 2008) (“Sprint Nextel Reply Comments”); Letter from Trey Hanbury, Sprint Nextel Corporation, to Marlene H. Dortch, Federal Communications Commission, WT Docket No. 07-195 (filed Mar. 5, 2008) (“Sprint Nextel March 5 *Ex Parte*”); Comments of ArrayComm LLC, WT Docket No. 07-195, at 4-7 (filed Dec. 14, 2007) (“ArrayComm Comments”); Comments of the Wireless Communications Association International, Inc., WT Docket No. 07-195, at 6-9 (filed Dec. 14, 2007) (“WCA Comments”).

broadband Internet service with open access conditions and aggressive buildout requirements.⁸ Facilitating the provision of this type of competitive wireless broadband offering should be of paramount importance to the Commission in fulfilling its public interest mandate to expand access to broadband services. M2Z has repeatedly refuted meritless claims (and calls for delay) from various incumbent spectrum licensees, including T-Mobile, Verizon, and AT&T, and from CTIA as well, regarding the potential for harmful interference from and to possible TDD operations in the AWS-3 band.⁹ The Commission should reject arguments previously made—and likely to be repeated in response to the *Further Notice*— by parties that seek to delay the introduction of alternative wireless broadband offerings through the imposition of non-neutral, overly burdensome, and unorthodox harmful interference protections. These requests are based on unsubstantiated and unjustified claims regarding the potential for harmful interference and erroneous assumptions about the rights and responsibilities of AWS-1 licensees.

⁸ See, e.g., M2Z May 5 *Ex Parte*; M2Z Reply Comments; M2Z Initial Comments; see also Comments of the Minority Media and Telecommunications Council and the Rainbow/PUSH Coalition, WT Docket No. 07-195, at 1-2, 7 (filed Dec. 14, 2007); Coalition for Free Broadband Now Comments, WT Docket No. 07-195 (filed Dec. 14, 2007) (collecting comments of individuals supporting Commission action to facilitate a free, wireless broadband offering in the AWS-3 band); see also Comments of the California Association for Local Economic Development, WT Docket No. 07-16, at 2-3 (filed Feb. 14, 2007) (noting that widespread governmental interest in deploying broadband stems from recognition that broadband access fosters economic development); Amicus Curiae Comments of the Minority Media and Telecommunications Council, WT Docket No. 07-16, at 10-11 (filed Mar. 2, 2007) (noting that the Internet is crucial to the success of all small and independent businesses, which account for over 99% of all companies, and asserting that “a free, nationwide broadband Internet access service would extend the potential of e-commerce to all businesses”); Comments of The Electronic Retailing Association, WT Docket Nos. 07-16 and 07-30, at 1-2 (filed Feb. 26, 2007) (noting that connection to the Internet makes available to online entrepreneurs the ability to market directly to the end-consumer in an affordable and direct way through e-mail, websites, and advertising); Comments of The Center for Digital Future, WT Docket No. 07-16, at 2 (filed Feb. 27, 2007) (explaining the importance of market competition by highlighting the price drop for DSL service and an associated increase in broadband adoption); Comments of FiberTower Corporation, WT Docket No. 07-16, at 2 (filed Mar. 2, 2007) (“Consumers win because they ultimately enjoy all the benefits of enhanced competition including greater choice and lower prices.”).

⁹ See, e.g., M2Z AWS-3 Interference Analysis, attached as an exhibit to Letter from Uzoma C. Onyeije, M2Z, to Ms. Marlene H. Dortch, WT Docket Nos. 07-195, 04-356, 07-16 & 07-30 (filed June 5, 2008) (“M2Z June 5 *Ex Parte*”); M2Z June 3 *Ex Parte*; see also Letter from Uzoma C. Onyeije, M2Z, to Chairman Kevin J. Martin and Commissioners, WT Docket Nos. 07-195 & 04-356 (filed June 20, 2008) (“M2Z June 20 *Ex Parte*”).

I. The Commission Should Adopt the Majority of the Proposed Service and Technical Rules to Facilitate the Deployment of a Free, Nationwide, Facilities-Based Broadband Service.

M2Z reiterates its longstanding support for the service rules and buildout requirements proposed in the *Further Notice*. Although M2Z believes that the public interest conditions and free service commitments proposed in the *Further Notice* can still be accomplished in a 20 megahertz block of usable spectrum pursuant to neutral service and technical rules advocated by M2Z herein, it also supports the Commission’s proposal to add an additional five megahertz to the AWS-3 band by combining the 2175-2180 MHz band with the 2155-2175 MHz band to the extent the Commission deems this step advisable in order to preserve the AWS-3 licensee’s flexibility to fulfill its regulatory obligations while also protecting adjacent band licensees. Under either scenario, M2Z believes that the Commission should adhere to its flexible use policies and technologically neutral precedents regarding harmful interference mitigation, whether it adds this additional five megahertz to the AWS-3 band or not.

As M2Z has demonstrated repeatedly throughout the course of these proceedings and the M2Z application and forbearance proceedings,¹⁰ service rules requiring the AWS-3 licensee to use a portion of the spectrum to provide a free wireless broadband service would serve the public interest and unlock tremendous consumer welfare benefits—especially for individuals and communities lacking ready access to affordable broadband services today.¹¹

M2Z believes, however, that some details of the proposed service rules require minor revision. For example, the proposed Section 27.1191(b)(3) and (f) would exclude from the definition of a free service recipient a “broadband user” that “pays any compensation for any

¹⁰ See, e.g., M2Z Networks, Inc. *Ex Parte* Response to Replies and Oppositions, WT Docket Nos. 07-16 & 07-30 (filed Apr. 16, 2007); Consolidated Opposition of M2Z Networks, Inc. to Petitions to Deny, WT Docket Nos. 07-16 & 07-30 (filed Mar. 26, 2007) (“M2Z Consolidated Opposition”).

¹¹ See, e.g., M2Z May 5 *Ex Parte* at 6-7, 21; M2Z Consolidated Opposition at 15-16.

broadband service directly or indirectly affiliated with the licensee.” This overly broad and largely inadministrable standard should be modified and converted to a per-device definition based on unique machine address identifiers, so that, for example, a “user” with multiple computers that subscribes to any premium service would still qualify as a user of the free service if that individual utilizes the free service on any of her machines. The proposed Section 27.1191(b)(3) also would make the minimum engineered data rate for the free service “subject to future reassessments by the Commission, including during the term of the license.” If adopted, this requirement would prove disruptive to the AWS-3 band licensee’s operations because of the uncertainty that the reassessment would create during the license term. Thus, any such “reassessment” should occur no earlier than at license renewal.¹²

Finally, the Commission should not adopt open eligibility for the 2155-2180 MHz band as proposed in the *Further Notice*, and should instead follow M2Z’s previous proposal for limiting the ability of incumbent wireless and wireline broadband providers to obtain this spectrum at auction and thereby block new entry.¹³ Open eligibility in the recently concluded 700 MHz auction resulted in incumbent licensees acquiring an overwhelming amount of the spectrum and no new nationwide competitors. By contrast, the recent Canadian AWS auction (which set aside some spectrum for new entrants) saw fierce competition for the new entrant bands in a highly successful auction.¹⁴ The Commission should take full advantage of the

¹² See M2Z May 5 *Ex Parte* at 16-17. To the extent that the Commission believes that the data rate requirement should be modified mid-term, such a license modification should be governed by the requirements of Section 316 of the Communications Act, 47 U.S.C. § 316.

¹³ See M2Z May 5 *Ex Parte* at 15 & n.26.

¹⁴ See, e.g., David George-Cosh, “Wireless auction raises \$4.25 billion; About 300 licences up for grabs. Canadians will have up to five more firms to choose from in each province, territory,” *Montreal Gazette*, July 22, 2008, at B2; David George-Cosh, “Wireless Users Stand to Win; Bidding Ends; New choices to emerge in cellphone market,” *National Post*, July 22, 2008, at A1; see also CIBC World Markets, “AWS Auction Finally Ends - \$4.25B Is A Big Tally,” at 4 (July 21, 2008) (“The set-aside spectrum [for new entrants] was, in our opinion, one of the key factors

opportunity in AWS-3 to facilitate the entry of a new, nationwide broadband competitor by adopting eligibility restrictions that truly promote new entry, in the process realizing both the benefits of new competitive entry as well as the interference mitigation and incumbent relocation efficiencies inherent in the nationwide licensing approach proposed by the Commission for the 2155-2180 MHz band.

These suggested improvements notwithstanding, M2Z applauds the Commission's general proposal for the AWS-3 band. Indeed, no participant in this proceeding has challenged or discredited the numerous filings extolling the public interest and consumer welfare benefits that would result from the adoption of the proposals in the *Further Notice* requiring the AWS-3 licensee to offer free broadband Internet access. The Commission's action to facilitate this type of service in the 25 megahertz AWS-3 band is especially welcome, considering that since January 1, 2005, the Commission has made available via auction or band restructuring the equivalent of more than 632 megahertz of spectrum for wireless broadband services,¹⁵ and none of those prior assignments and allocations—nor indeed any of the Commission's prior auctions or wireless spectrum license grants—made any reservation for a free, family-friendly wireless broadband service. Furthermore, the open devices and open applications requirements proposed in the *Further Notice* would encourage adoption of service, innovation, and robust use in the AWS-3 band by a wide variety of users, including those without broadband access currently and those seeking competitive alternatives to incumbent wireline offerings.¹⁶

that led to the high level of competitive bidding (and hence, higher prices), luring in bidders that would have otherwise not participated in the auction.”).

¹⁵ These spectrum blocks include 50 megahertz in the 3650-3700 MHz band, 250 megahertz in the 5.2-5.8 GHz band, 190 megahertz in the BRS/EBS bands, 90 megahertz in AWS-1, and 52 megahertz in the 700 MHz band (excluding the Upper 700 MHz D Block).

¹⁶ See, e.g., M2Z May 5 *Ex Parte* at 17-20; M2Z Reply Comments at 29.

Although the ten-year license term and buildout benchmarks proposed in the *Further Notice* differ in some respects from the proposals that M2Z originally supported, M2Z remains confident that the Commission can promote rapid network buildout in the AWS-3 band without unnecessarily aggravating the already formidable challenges associated with deploying a new network in the band. Moreover, the Commission's approach in crafting the AWS-3 service rules is appropriately flexible and technologically neutral insofar as it permits downlink and uplink transmissions throughout the entire 2155-2180 MHz band. Under such an approach, the eventual AWS-3 licensee will have the ability to deploy the most efficient technologies and should have the capacity necessary to provide services at rates meeting the Commission's recently revised definitions for broadband.¹⁷

M2Z supports the Commission's proposed combination of the 2155-2175 MHz band and the 2175-2180 MHz because it could provide additional capacity and greater flexibility for the ultimate AWS-3 licensee in its provision of broadband services. It is worth noting, however, that two-way services could be offered pursuant to standard, neutral technical rules in the twenty megahertz block (2155-2175 MHz) initially proposed in the AWS-3 proceeding without causing harmful interference to adjacent band operations. As described in greater detail in Part II below, M2Z and others have demonstrated conclusively in these proceedings that the Commission's standard technical rules for flexible operations, in-band power, and OOB limits would be sufficient to protect adjacent band licensees *and* the AWS-3 licensee¹⁸ from the likelihood of

¹⁷ See *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data Interconnected Voice over Internet Protocol (VoIP)*, WC Docket No. 07-38, Report and Order, FCC 08-89 (rel. June 12, 2008).

¹⁸ Despite unfounded claims of so-called asymmetrical interference from AWS-3 operations to AWS-1 operations, the potential for harmful interference would be present to licensees in both bands. See Letter from Uzoma C.

harmful interference, and M2Z supports the inclusion of such protections in any service rules that the Commission might adopt.¹⁹ Moreover, expert analysis submitted into the record has shown that, regardless of whether the AWS-3 band consists of 20 or 25 megahertz, the adoption of overly restrictive OOB limits on AWS-3 would only have a negligible albeit positive impact on the capacity and protections afforded to AWS-1 licensees. On the other hand, these overly restrictive limits would severely curtail the available bandwidth for the eventual AWS-3 licensee.²⁰

For these reasons and those described more fully below, M2Z supports the Commission's proposal to combine the 2155-2175 MHz band with the 2175-2180 MHz band, but not at the expense of neutral and flexible technical rules such as those previously proposed by M2Z to protect both the eventual AWS-3 licensee and adjacent band licensees from harmful interference.

II. The Commission Should Adopt Standard, Neutral Technical Rules for the AWS-3 Band and Should Reject Incumbent Licensees' Claims to Expanded Protections for Which They Have No Reasonable Need or Expectations.

M2Z and other commenters have shown throughout these proceedings that the likelihood of mobile-to-mobile harmful interference from TDD operations in the band would be exceedingly small;²¹ that probabilistic analyses (rather than worst-case scenarios) provide the

Onyeije, M2Z, to Chairman Kevin J. Martin and Commissioners, WT Docket Nos. 07-195 & 04-356, at 5 (filed Jun. 10, 2008) ("M2Z June 10 *Ex Parte*") (refuting CTIA claims of asymmetric interference potential and incentives).

¹⁹ See, e.g., Letter from Uzoma Onyeije, M2Z, to Marlene H. Dortch, Esq., WT Docket Nos. 07-195 & 04-356, at 1-3 (filed June 17, 2008) ("M2Z June 17 *Ex Parte*"); M2Z Reply Comments at 2-10, 20.

²⁰ See, e.g., M2Z June 3 *Ex Parte* at 3-4.

²¹ See, e.g., M2Z Reply Comments at 12-15; M2Z Initial Comments at 40-41; see also M2Z June 3 *Ex Parte* and Alion Science and Technology, "Analysis of AWS-3 to AWS-1 Mobile to Mobile Interference Effects," attached thereto as Attachment A; Letter from Uzoma C. Onyeije, M2Z, to Ms. Marlene H. Dortch, Esq., WT Docket Nos. 07-195, 04-356, 07-16 & 07-30, at 1 (filed June 17, 2008) ("M2Z June 17 Technical Overview"); Sprint Nextel Reply Comments at 18.

Sprint Nextel's analysis indicates that, under extreme worst case conditions not likely to exist in the field, . . . [t]he probabilities of [an] interference event occurring [from a TDD AWS-3 handset generating OOB into the AWS-1 band] are exceptionally low and, indeed, no different in the 2.1 GHz band than they are in the 700 MHz, 2 GHz, or 2.5 GHz bands. Equally important, moreover, the

most appropriate means for assessing such likelihoods;²² and that the remote chance of harmful interference would be made even more unlikely through the use of dynamic interference mitigation techniques not heretofore acknowledged or considered by opponents of flexible use.²³ M2Z also has shown that the Commission’s standard $43+10 \log (P)$ OOB limit would be most appropriate and should be adopted for the AWS-3 band—whether it consists of 20 or 25 megahertz—as the Commission has routinely adopted the $43+10 \log (P)$ standard when placing new commercial broadband spectrum into the market and when there is a theoretical possibility of mobile-to-mobile interference.²⁴

The *Further Notice* nonetheless proposes a requirement for “AWS-3 mobiles to attenuate out-of-band emissions (OOBE) by $60 + 10\log (P)$ dB outside of the AWS-3 band,” and would “establish a power limit for AWS-3 mobile devices of 23 dBm/MHz equivalent isotropically radiated power (EIRP).”²⁵ Such overly restrictive limits are not necessary to provide adequate protection to adjacent band licensees against harmful interference from mobile operations in the 2155-2180 MHz band because the $43+10 \log (P)$ standard is just as appropriate in this circumstance as it has been in other recent services rules proceedings, and there is no duty whatsoever to provide adjacent band licensees with enhanced protections here. Such limits would reduce the usable spectrum available to the AWS-3 licensee while providing only

extreme case mobile-to-mobile OOB distance is far less than the distance of nearly 5000 meters at which interference could occur due to *adjacent-channel AWS-1 base stations* operating at the current $43 + 10 \log P$ attenuation standard that applies to AWS-1 licensees

Id. (emphases in original).

²² See, e.g., M2Z Reply Comments at 10-15.

²³ See, e.g., M2Z Reply Comments at 2, 13; Letter from Uzoma Onyeije, M2Z, to Ms. Marlene H. Dortch, WT Docket Nos. 07-195, 04-356, 07-16 & 07-30, at 16 (filed Jul. 2, 2008) (“M2Z July 2 Technical Overview”); see also Sprint Nextel Reply Comments at 2, 14.

²⁴ See, e.g., M2Z June 17 *Ex Parte* at 1-3.

²⁵ *Further Notice* ¶ 3.

immaterial or illusory additional protections to adjacent band licensees.²⁶ The Commission’s proposal to assign a single exclusive license for a twenty-five megahertz AWS-3 band would make the free broadband service exceptionally robust, especially in conjunction with the adoption of the $43 + 10 \log (P)$ standard, which would make attainment of aggressive buildout commitments and data rate requirements possible. By contrast, the adoption of a $60 + 10 \log (P)$ OOB limit would be unwarranted and would provide little additional protection to AWS-1 licenses—yet it would significantly reduce the amount of usable AWS-3 spectrum.²⁷ The Commission should not adopt any approach that might limit the AWS-3 licensee to less than the twenty megahertz of usable spectrum that the Commission has recognized as essential for the provision of robust wireless broadband offerings.²⁸

M2Z further notes that the proposal to limit AWS-3 mobiles to 23 dBm/MHz EIRP is a power spectral density limit not directly related to the front-end overload or desensitization mobile-to-mobile concerns repeatedly raised by others and addressed by M2Z in these dockets. The 23 dBm/MHz limitation could be an appropriate method for addressing mobile-to-mobile intermodulation (or “IM”) interference concerns, but no such concerns are relevant in AWS-3, nor have any such concerns been presented by the Commission or participants in the lengthy AWS-3 proceeding. As a result, a power spectral density limitation for AWS-3 would be

²⁶ See M2Z June 3 *Ex Parte* at 4 and Attachment A at 2.

²⁷ See *id.*

²⁸ See *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Second Report and Order, 22 FCC Rcd 15289, ¶ 69 (2007) (“700 MHz Second Report and Order”) (noting that spectrum blocks that are 20 MHz or larger “enable a broader range of broadband services (including Internet access at faster speeds), accommodate future higher data rates, and provide operators with additional capacity and, importantly, flexibility”); see also *Service Rules for Advanced Wireless Services in the 1.7 and 2.1 GHz Bands*, Report and Order, 18 FCC Rcd 25162, ¶ 44 (2003) (“AWS-1 Report and Order”).

inappropriate due to the simple reason that the need for such a limit does not exist.²⁹ If the Commission is instead concerned with theoretical mobile-to-mobile interference of other varieties, appropriate mitigation techniques could include the technologically neutral OOB limits suggested by M2Z and others,³⁰ as well as technical rules that address the potential for front-end overload or desensitization mobile-to-mobile interference.

M2Z respectfully submits that instead of adopting the in-band mobile power limit of 23 dBm/MHz proposed in the *Further Notice*, the Commission should instead adopt a 33 dBm mobile power limit. The 33 dBm standard would address the theoretical front-end overload interference issues raised in this proceeding, would be consistent with previous Commission action in the BRS/EBS band, and would be more restrictive than the limits adopted in the 700 MHz proceedings.³¹ The adoption of M2Z's proposed mobile in-band and OOB limits would reflect a reasonable trade-off between the need for flexible rules that promote AWS-3 network deployment and the need to protect adjacent band licensees from realistic harmful interference scenarios. For example, adoption of the 33 dBm standard—even in the absence of any mitigation techniques—would prevent harmful interference even to less than robust AWS-1 mobile devices designed without any consideration of possible uplink use of AWS-3. Newer, more robust AWS-1 units that carriers would introduce over time would undoubtedly integrate filters and duplexers covering only the AWS-1 band, as opposed to the entire 2110-2180 MHz band allocated for AWS in other countries, and would use an architecture that is more robust

²⁹ M2Z notes, for example, that theoretical IM interference could be an issue for devices operating in the H Block pursuant to the rules proposed in paragraph 4 of the *Further Notice*, meaning that the limit of 23 dBm/MHz proposed for mobile devices in those bands could be an appropriate measure for addressing interference concerns.

³⁰ See, e.g., ArrayComm Comments at 7-9; WCA Comments at 12-13; Sprint Nextel Reply Comments at 14.

³¹ See 47 C.F.R. § 27.50(h)(2) (limiting BRS/EBS mobile stations to 2.0 watts EIRP, which is equivalent to 33 dBm EIRP); *id.* § 27.50(c)(10) (limiting Lower 700 MHz band handheld devices to 3 watts ERP, which is equivalent to 37 dBm); *id.* § 27.50(b)(10) (establishing the same 3 watt limit for Upper 700 MHz band handheld devices).

with respect to adjacent channel signals than the direct conversion architecture of units presently in the AWS-1 carriers' supply pipeline.³² These newer handsets would employ better, more modern receiver architectures to protect against both OOBE and front-end overload interference, thereby reducing even further the already small likelihood of harmful mobile-to-mobile interference. Ofcom, the United Kingdom's communications regulator, released an April 2008 statement on the impact of adjacent TDD and FDD mobile operations demonstrating the robustness that can be achieved when TDD coexistence is a design consideration for FDD mobiles.³³

Even with AWS-1 handsets that apparently were designed without due regard for the well-noticed possibility of TDD operations in the adjacent AWS-3 band, standard power limits would prevent harmful interference in all possible scenarios except where AWS-1 and AWS-3 mobile devices were within close proximity of each other, both devices were transmitting at the same time, and the AWS-1 device would be located more than 1.2 km away from its base station and operating in the peak of the AWS-3 unit's power profile.³⁴ The chances of all of these conditions occurring at the same time is extremely low,³⁵ as confirmed by Alion's³⁶ and

³² For example, handsets utilizing the superheterodyne architecture—that dates from the 1930s and that has been widely used in mobiles in the past—have much greater immunity to strong adjacent channel signals due to this type of handset's use of analog intermediate frequency filters.

³³ See Ofcom, "On the impact of interference from TDD terminal stations to FDD terminal stations in the 2.6 GHz band," at 44 n.33 (Apr. 21, 2008), available at <http://www.ofcom.org.uk/consult/condocs/2ghzregsnotice/tech.pdf>. (citing ERA Technology, "Measurements of UTRA-FDD user equipment characteristics in the 2.1 GHz band," at 4-5 (Apr. 2008) (reporting test data on receiver adjacent channel selectivity and receiver blocking performance characteristics for UMTS mobile devices currently available in the U.K. market)).

³⁴ See, e.g., M2Z Reply Comments at 13.

³⁵ See *id.* (reporting the estimated, potential occurrence of harmful mobile-to-mobile interference to an AWS-1 user approximately once every 2.4 months, even under worst-case conditions); see also Sprint Nextel March 5 *Ex Parte* at 6 (noting that mobile-to-mobile issues are very low probability events that depend upon simultaneous operation at maximum power, in close proximity and on adjacent channels, and with insufficient error correction and channel isolation).

³⁶ See, e.g., See M2Z June 3 *Ex Parte*, Attachment A, at 7, 12-13.

Ofcom's analyses of interference probabilities for adjacent band TDD and FDD operations.³⁷ Moreover, if these conditions ever do all occur at the same time, harmful interference to AWS-1 operations can still be avoided through the use of the multiband capabilities of handsets that would enable a handoff to an alternative, unaffected band, along with other cognitive or adaptive antenna systems and techniques that could be employed by cooperating AWS-1 and AWS-3 operators, and other mitigation techniques previously discussed in this proceeding.³⁸

T-Mobile, AT&T, Verizon, and CTIA have generated tremendous heat, but little light, with repetitious and meritless *ex parte* filings regarding the interference protections that the Commission purportedly owes to adjacent band licensees. T-Mobile also has claimed incorrectly that the proponents of allowing TDD operations in the AWS-3 band bear a special burden to demonstrate that such operations will cause no harmful interference to adjacent band licensees, supporting its mistaken assertion by distorting the Commission's language in past decisions.³⁹ The transparently self-serving arguments made by these incumbents (as well as their trade association and equipment suppliers) do nothing to undermine the solid, objective engineering

³⁷ See M2Z Reply Comments at 13 (summarizing findings of Ofcom's study conducted by Mason Communications, Ltd., "2500-2690MHz, 2010-2025MHz and 2290-2302MHz Spectrum Awards – Engineering Study (Phase 2)" (Nov. 2006), available at <http://www.ofcom.org.uk/consult/condocs/2ghzawards/masonresearch.pdf>); see also Ofcom, "Award of available spectrum: 2500-2690MHz, 2010-2025MHz," at 3 (Aug. 1, 2007), available at <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/main.pdf> (concluding that "the percentage of overall FDD connections that would suffer blocking would rise by no more than 0.5% under plausible assumptions, similar to the level of lost or failed connections that FDD terminals would typically suffer in their own network regardless of other users," and further concluding that "[i]f network operators acquiring 2.6GHz spectrum were concerned about the blocking effect in certain situations, then it is possible that they would be able to take a number of mitigation actions").

³⁸ See, e.g., Sprint Nextel March 5 *Ex Parte* at 8.

³⁹ See M2Z June 20 *Ex Parte* at 1-2. T-Mobile has argued erroneously that the Commission's decision not to authorize TDD operations within the AWS-1 band somehow applies to the AWS-3 band as well, despite the fact that the Commission—in the very next sentence of the order cited by T-Mobile—made clear its intentions to consider TDD operations in the AWS-3 band. See *AWS-1 Report and Order* ¶ 46 (2003) ("[W]e will make every effort to provide spectrum opportunities for TDD systems in future allocation and spectrum proceedings, such as in the *AWS Allocation* proceeding.").

analysis submitted into the record by M2Z⁴⁰ and other proponents of neutral technical rules for the AWS-3 band. Despite the fact that a host of harmful interference mitigation techniques can, should, and would be used by the AWS-3 licensee and its spectral neighbors to prevent the worst case scenarios discussed by incumbent licensee interests, these carriers and their allies continue complaining about a parade of horrors backed only by incomplete analyses and flawed assumptions.

Each time such arguments have been raised, M2Z has answered them. For example, M2Z has refuted claims that AWS-1 and PCS licensees had insufficient notice of the possibility that the Commission could authorize TDD operations in the AWS-3 band.⁴¹ M2Z also has shown that despite the adequacy of such notice, incumbent carriers made indefensible business decisions to equip AWS-1 mobile devices with filters designed to receive transmissions in the 2155-2180 MHz band—a band not licensed to these carriers.⁴² All Commission spectrum licensees have certain rights and concomitant responsibilities. Claims to especially stringent protections against harmful interference should not be heard from incumbent licensees that had the ability to make their operations less susceptible to signals in other bands but failed to prepare adequately for the introduction of long-overdue and well-noticed new services that would produce such signals. AWS-1 licensees in particular have benefited from Commission decisions to provide F Block license holders with larger spectrum blocks and higher power limits designed

⁴⁰ See M2Z June 3 *Ex Parte* and Attachment A thereto (Alion Science and Technology Analysis).

⁴¹ See, e.g., Letter from Uzoma Onyeije, M2Z, to Mr. Matthew Berry, General Counsel, Federal Communications Commission, WT Docket Nos. 07-195 & 04-356, at 2-3 (filed June 23, 2008) (likewise refuting CTIA claims that a decision to permit two-way transmissions could constitute a taking, retroactive rulemaking, or breach of contract).

⁴² See, e.g., M2Z June 5 *Ex Parte* at 1; M2Z June 10 *Ex Parte* at 4-5; M2Z June 17 Technical Overview at 6; see also M2Z Reply Comments at 15.

to allow for internal measures “to resolve adjacent band interference concerns.”⁴³

Notwithstanding their protests to the contrary, incumbent licensees pleading for overly restrictive technical rules and seeking to place other obstacles in the way of AWS-3 deployment have been given enough opportunities to refute the case for neutral technical rules, yet they have been unable to do so.

⁴³ *AWS-1 Report and Order* ¶ 43 (noting that the Commission’s “spectrum block arrangement provides licensees with maximum flexibility to resolve adjacent band interference issues . . . in the 1710-1755 and 2110-2155 MHz bands,” because “[b]y placing the larger 10 and 15 megahertz blocks at either end of the two bands, licensees in these segments will have sufficient bandwidth and maximum flexibility to resolve adjacent band interference concerns”).

CONCLUSION

The Commission should adopt the service and technical rules for the AWS-3 band proposed in the *Further Notice*, except for the overly restrictive or inapposite OOB and power spectral density limits proposed for AWS-3 mobile devices, as well as certain operational rules establishing methods for counting free service users, adjusting minimum engineered data rates, and making the spectrum available to bidders other than new entrants. The record developed in these proceedings amply supports, and the public interest requires, that the Commission adopt flexible and technologically neutral technical rules akin to those adopted in other recent proceedings conducted to make available new commercial broadband spectrum licenses. For these reasons, the Commission should adopt the majority of the proposed rules set forth in the *Further Notice* while modifying the technical rules proposed for AWS-3 mobile operations. Most importantly, the Commission should act expeditiously to prevent further delay in the assignment of the AWS-3 license and the deployment of new and much-needed competitive wireless broadband facilities and services.

Respectfully submitted,

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Exhibit A

Suggested Amendments to Proposed Service Rules for the 2155-2180 MHz (AWS-3) Band

New language: Section 27.12 is revised to read as follows:

§ 27.12 **Eligibility.** - Except as provided in §§ 27.604, ~~27.1195~~, 27.1201, and 27.1202, any entity other than those precluded by Section 310 of the Communications Act of 1934, as amended, 47 USC 310, is eligible to hold a license under this part.

* * *

11. Section 27.50(d) is revised to read as follows:

§ 27.50 Power and antenna height limits.

...

(d) The following power and antenna height requirements apply to stations transmitting in the 1710-1755 MHz, 1915-1920 MHz, 1995-2000 MHz, and 2110-2180 MHz bands:

...

(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to 1 watt (W) EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. ~~Mobile and portable stations operating in the 2155-2180 MHz band are limited to 2 watts (W) EIRP.~~ Mobile and portable stations operating in the 1915-1920 MHz ~~band~~, are limited to 200 milliwatts/MHz (mW/MHz) peak EIRP. Uplink fixed stations operating in the 1915-1920 MHz and 2155-2180 MHz bands are limited to 2 watts/MHz (W/MHz) peak EIRP. Mobile and portable stations operating in the 1710-1755 MHz, 1915-1920 MHz, and 2155-2180 MHz bands must employ a means for limiting power to the minimum necessary for successful communications.

Deleted: and 2155-2180 MHz bands

* * *

12. Paragraph (h) of Section 27.53 is revised as follows:

§ 27.53 Emission limits.

...

(h) For operations in the 1710-1755 MHz, 1915-1920 MHz, 1995-2000 MHz, and 2110-2180 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated in accordance with the following:

(1) For all operations in the 1710-1755 MHz, 1995-2000 MHz, ~~2110-2155 MHz, and 2155-2180 MHz~~ bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB;

Deleted: and

Deleted: and for all base and downlink fixed station operations in the 2155-2180 MHz band

Deleted: (2) For all mobile, portable, and uplink fixed station operations in the 2155-2180 MHz band, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $60 + 10 \log_{10}(P)$ dB;

* * *

14. Add new § 27.1191 with new subheading as follows:

SPECIAL PROVISIONS GOVERNING THE 2155-2180 MHZ BAND

§ 27.1191 Free wireless broadband service requirement in the 2155-2180 MHz band.

...

(b) *Provision of free broadband service.* A licensee (including lessees) offering any service on spectrum subject to this section must utilize up to twenty-five percent of its AWS-3 wireless network capacity to provide free two-way wireless broadband Internet service (“free broadband service”) at a minimum engineered data rate of 768 kbps downstream per user.

...

(3) Broadband users that are not required to pay recurring compensation for broadband services that they receive via a user/customer device with a unique machine address are considered to receive free broadband service with respect to that device. If a broadband user pays recurring compensation for broadband service offered by the licensee or an affiliate of the licensee to a user/customer device with a unique machine address, then the broadband user does not receive free service with respect to that device. The compensation paid for broadband service does not include any compensation paid for user/customer equipment. A minimum engineered data rate means that the wireless network is designed, constructed, and implemented to provide meet or exceed the minimum data rate as measured to/from user devices and the AWS-3 licensee’s wireless facilities. The minimum engineered data rate is subject to future re-assessments by the Commission at the renewal of the license.

Deleted: any

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Deleted: any

Deleted: any

Deleted: directly or indirectly affiliated with the licensee,

Deleted: For purposes of this requirement, wireless broadband users receive either free or fee-base service, not both.

Deleted: , including during the term of

...

(f) *Fee-based services.* Subject to the provisions in this section, a 2155-2180 MHz licensee may provide and prioritize fee-based services as set forth in paragraph (b). Use of the wireless network for any fee-based service provided to any single device with a unique machine address may not be counted towards satisfaction of the requirement to provide free broadband service.

Deleted: Users and u

* * *

New language: Add new Section 27.1195 to read as follows:

§ 27.1195 Limitation on license won at auction. - For the auction of the license in the 2155-2180 MHz band, as defined in § 27.5(j), no applicant that holds a terrestrial wireless license issued by the Commission, provides broadband service, or that is affiliated with a terrestrial wireless licensee or with a provider of broadband service, may participate in the auction.