

**CTIA-The Wireless Association®
Presentation to
Federal Communications Commission
Office of Engineering and Technology**

July 10, 2008

Overview

- The FCC should adopt rules that protect Broadband PCS and AWS-1 licensees from interference.
- Potential licensees are on notice that AWS-2 and AWS-3 mobile transmissions will only be permitted if adjacent licensees are protected from interference.
- M2Z has not accepted any responsibility for the interference it would create under the proposed rules.
 - Handset filtering will not resolve AWS-3 mobile-to-mobile interference.
 - An AWS-3 licensee permitted mobile transmissions will have less incentives to cooperate and avoid harmful interference.
- Proposed H Block rules are not adequately protective to adjacent broadband PCS customers.
- Better alternatives to the proposed rules already have been placed in the record.
- The FCC should not adopt technical rules for the AWS-3 band that are less protective than those adopted for the H Block.

The FCC Should Not Depart From Policies on Interference Protection

- Efficient and effective use of spectrum resources largely hinges on the ability to avoid harmful interference among licensees, and preventing interference is a key spectrum management responsibility of the FCC.
- Interference among spectrum licensees, if not managed effectively, degrades service to consumers and, as a result, diminishes the value of wireless services and the spectrum upon which they are based.
- The FCC’s AWS-2 and AWS-3 Service Rule NPRMs detailed the importance of protecting adjacent licensees from interference.
 - “[W]e are concerned about potential interference from handsets transmitting in the 1915-1920 MHz band to PCS handsets receiving in the 1930-1990 MHz band. . . [W]e seek comment on the adoption of strict out-of-band emission limits (paragraph 91) and reduced power limits (paragraph 107) for handsets operating in the 1915-1920 MHz band.” See FCC 04-218 at para. 86 (Sep. 24, 2004).
 - “[U]plink transmissions may raise potentially significant interference issues associated with the presence of both mobile and base station transmissions in the band. We therefore seek comment on methods to address such concerns, including the use of power limits and out-of-band emissions restrictions.” See FCC 07-164 at para. 2 (Sep. 19, 2007).

M2Z Must Conclusively Demonstrate It Will Not Interfere With AWS-1 Users

- In the AWS-3 Service Rules NPRM, the FCC sought comment on “technical and operational rules to protect these various services from harmful interference” and repeatedly expressed concerns about interference “if we were to permit mobile transmissions in the 2155-2175 MHz band.” FCC 07-164 at paras. 49-51 (Sep. 19, 2007).
 - “[A]dditional flexibility may come at the cost of additional interference protections that would severely restrict the utility of mobile transmission in the band.” *Id.* at para. 11.
- In the AWS-1 rulemaking, for example, the FCC made interference protection a condition on even considering the placement mobile transmissions in close proximity to mobile receives.
 - “If proponents of TDD *can conclusively demonstrate* that portions of this spectrum could be used for such transmission *without causing interference* to Federal government users or other licensees, we *could* revisit this issue at a future date.” FCC 03-251 at para. 46 (Nov. 23, 2003) (emphasis added).
- M2Z clearly has been on notice that it will not be permitted to operate TDD unless it *conclusively demonstrates* that it will not interfere with adjacent licensees.

M2Z Has Inappropriately Exaggerated and Distorted FCC Statements

- The Commission never stated that “TDD would likely be deployed in AWS-3.” See M2Z 06/17/08 Ex Parte. Nor has “[t]he Commission noted its plans for TDD services in the AWS-3 bands before and after Auction 66.” See M2Z 07/02/08 Ex Parte.
 - The only time the Commission has come close to expressing a “desire to allocate AWS-3 for TDD” was in its recently adopted Further Notice of Proposed Rulemaking. See FCC 08-158 (Jun. 20, 2008).
- Prior to the June 20, 2008 FNPRM, the Commission always discussed TDD in the context of other options, including those currently under consideration for the AWS-3 band – asymmetric pairing, downlink only, structured uplink/downlink, etc. See FCC 03-16 paras. 68-70, FCC 03-251 paras. 43-46, FCC 07-164 paras. 49-51.
- As discussed above, the Commission also has always conditioned any consideration of TDD on a demonstration that such operations will not interfere with adjacent operations.

Handset Filtering Will Not Resolve AWS-3 Mobile-to-Mobile Interference

- Filtering technology cannot eliminate receiver overload interference to AWS-1 devices that would result from AWS-3 mobiles transmitting at 2155-2180 MHz.
- Designing filters to receive signals at 2110-2155 MHz will not eliminate this problem.
- According to Avago, frequency separation is necessary for a filter to achieve the desired amount of rejection.
 - Separation should account for the steepness of filter roll off between the pass band and the desired rejection level, changes of the filter response with temperature changes, and part-to-part variation between filters arising from manufacturing process tolerances.
- According to Avago, these factors equate to about 15 MHz of necessary separation between mobile transmissions and mobile receptions. Even M2Z recognizes that about 15 MHz is needed. See M2Z 06/03/08 Ex Parte, attached Alion Study, p. 7
 - This fact undercuts M2Z's arguments that an AWS-1 F Block licensee operating on 10 MHz could or should internalize all adjacent band interference.

The AWS-3 and H Block Licensees' Incentives to Reduce Interference are not Mutual to Their Neighbors

- An AWS-3 or H Block licensee permitted mobile transmissions will have less incentives than an adjacent AWS-1 or broadband PCS licensee to cooperate and avoid harmful interference.
- AWS-3 or H block mobile transmissions would impair AWS-1 or broadband PCS handsets, but not vice versa.
- Although base-to-base interference can be readily addressed by the AWS-3 licensee, mobile-to-mobile interference cannot be readily addressed by the AWS-1 licensee.
 - The AWS-3 licensee can unilaterally deploy a variety of measures to protect its base stations against interference.
 - As discussed above, the AWS-1 licensee cannot – even with highly efficient filters – protect itself from mobile-to-mobile interference from the AWS-3 band.

Proposed H Block Rules Are Not Adequately Protective

- The Commission should not allocate or license 1915-1920 / 1995-2000 MHz band for services (e.g., mobile transmissions) in a way that would cause harmful interference to existing PCS systems.
- Independent handset testing showed that the FCC's proposal would subject PCS handsets to harmful interference where H Block devices transmit 8 meters away in some instances.
- The Commission should adopt power limits on H block licensee handsets that adequately protect broadband PCS customer handsets from overload and intermodulation effects.

AWS-3 – There Are Better Alternatives in the Record

- The Commission can craft AWS-3 rules that permit valued use of the band without imposing rules that either dictate a single business plan or unnecessarily impede the prospects for adjacent licensees in the AWS-1 band. For example:
 - The Commission could adopt the downlink-only approach it raised in the *AWS-3 Notice*.
 - The AWS-2 J Block could be combined with the AWS-3 spectrum into a single license, with the 2020-2025 MHz block used for uplink and the 2155-2180 MHz block used for downlink.
- These approaches would:
 - Provide opportunities for new and emerging broadband competitors;
 - Protect adjacent licensee broadband competitors from interference;
 - Result in valuable and efficient use of the spectrum; and
 - Facilitate international harmonization.

The FCC Must Adopt Protective Out of Band Emission Limits

- The FCC has proposed to adopt rules for the AWS-3 band that are *less* protective than those proposed for the H Block, inexplicably resulting in significantly more interference to AWS-1 devices than PCS devices.
 - The Commission proposes an OOBE limit of $90 + 10 \log(P)$ dB on H Block transmissions into the PCS band 1930-1990, but it only proposes an OOBE limit of $60 + 10 \log(P)$ dB on AWS-3 transmissions into the adjacent AWS-1 mobile receive band.
- Rules for the AWS-3 band should be *at least* as protective as those adopted for the H Block.