

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Amendment of Part 2 of the Commission's)
Rules to Allocate Spectrum Below 3 GHz for) ET Docket No. 00-258
Mobile and Fixed Services to Support the)
Introduction of New Advanced Wireless)
Services, including Third Generation Wireless)
Systems)

**REPLY COMMENTS IN RESPONSE TO
THIRD NOTICE OF PROPOSED RULEMAKING**

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EXECUTIVE SUMMARY

The record developed in response to the *Third NPRM* reinforces that the only viable spectrum that can accommodate relocation of MDS Channels 1 and 2/2A is the G Block.

Retreating from prior concerns, the broadband PCS licensees and vendors acknowledge that the G Block can be utilized without material degradation of broadband PCS service. Indeed, they have urged the Commission to impose the Part 24 technical rules upon the G Block, without any modification to protect broadband PCS. WCA agrees with that approach. However, commenters have unanimously rejected the Commission's suggestion that the entire 1910-1920 MHz and 1990-2000 MHz band be paired for PCS-like services, in part, because use of the entire 1910-1920 MHz band it would leave insufficient separation to protect broadband PCS use of the 1930-1990 MHz band.

Those who addressed the issue also agree with WCA that MDS cannot be relocated on an unpaired basis within the 2155-2180 MHz band because of the substantial interference that would result between MDS (which would utilize TDD technology) and AWS in the 2110-2155 MHz band and MSS/ATC in the 2180-2200 MHz band (both of which will be engaged in base station transmissions using FDD technology). Indeed, only one commenting party has suggested that MDS be relocated to any place other than the G Block. However, the suggestion that MDS could be relocated to the 2020-2025 MHz band paired with 5 MHz at 2155-2180 MHz ignored the substantial interference that MDS at 2020-2025 MHz (or any service that uses the band for subscriber-to-base transmissions) would suffer from BAS operations at 2025 MHz and above.

Additionally, the record clearly shows that the Commission should not capitulate to Nextel's demand for a nationwide license in the 1910-1915/1990-1995 MHz band. Once again, Nextel has failed to demonstrate that the public interest would be served by the swapping of its hodgepodge 700/800/900 MHz spectrum for a nationwide license of clear spectrum at 1910-1915/1990-1995 MHz. Such a swap is irrelevant to the resolution of the interference Nextel causes to public safety in the 800 MHz band.

Finally, there is absolutely no support in the record to blindly apply the point-to-point microwave relocation policies to the relocation of MDS licensees. No one disputes the point that WCA has made over and over in the proceeding -- those policies must be substantially modified in order to make whole displaced MDS licensees, their channel lessees and consumers.

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The Wireless Communications Association International, Inc. (“WCA”) hereby replies to the comments submitted in response to the *Third Notice of Proposed Rulemaking* (“*Third NPRM*”) in the above-captioned proceeding.¹ Now that the Commission has received, for the third time, comment on the relocation of the Multipoint Distribution Service (“MDS”) from the 2150-2162 MHz band, the record is clear -- the only viable spectrum to which MDS licensees in the 2150-2162 MHz band can be relocated is at 1910-1916 MHz and 1990-1996 MHz.

I. THE RECORD REFLECTS BROAD SUPPORT FOR THE ESTABLISHMENT OF THE G BLOCK, BUT OPPOSITION TO THE PAIRING OF 1910-1920/1990-2000 MHZ FOR PCS-LIKE SERVICES.

In its comments, WCA reiterated its long-standing call for the Commission to establish a new channel pairing at 1910-1916/1990-1996 MHz, and demonstrated that such a pairing could be established without adverse consequences for broadband Personal

¹ *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems*, FCC 03-16, ET Docket No. 00-258 (rel. Feb. 10, 2003) [“*Third NPRM*”].

Communications Service (“PCS”) licensees in the 1850-1910/1930-1990 MHz bands.² WCA also demonstrated that the proposed pairing could not be expanded to include the entire 1910-1920/1990-2000 MHz band without significant adverse consequences.³

WCA was far from alone in its views. Indeed, Cingular Wireless LLC (“Cingular”) and Ad Hoc MDS Alliance support WCA’s proposal in full.⁴ Meanwhile, Motorola, the Cellular Telecommunications & Internet Association, (“CTIA”), Ericsson and Verizon Wireless (“Verizon”) all took the view that the Commission can authorize a pairing of the 1910-1915/1990-1995 MHz band (which is now being called the “G Block”) for operation under the current Part 24 PCS rules without jeopardizing existing operations.⁵ At the same time, commenting parties unanimously rejected the Commission’s suggestion that the entire 1910-1920 MHz and 1990-2000 MHz band be paired for PCS-like services.⁶ In that regard,

² See Comments of Wireless Communications Ass’n Int’l, ET Docket No. 00-258, at 12-28 (filed April 14, 2003)[“WCA Third NPRM Comments”].

³ See *id.* at 16-22.

⁴ See Comments of Cingular Wireless, ET Docket no. 00-258, at 2-5 (filed April 14, 2003)[“Cingular Third NPRM Comments”]; Comments of Ad Hoc MDS Alliance, ET Docket No. 00-258, at 3-5 (filed April 14, 2003)[“Ad Hoc Third NPRM Comments”].

⁵ See Comments of Motorola, ET Docket No. 00-258, at 2-4 (filed April 14, 2003)[“Motorola Third NPRM Comments”]; Comments of Cellular Telecommunications & Internet Ass’n, ET Docket No. 00-258, at 2 (filed April 14, 2003)[“CITA Third NPRM Comments”]; Comments of Ericsson, ET Docket No. 00-258, at 3 (filed April 14, 2003) [“Ericsson Third NPRM Comments”]; Comments of Verizon Wireless, ET Docket No. 00-258, at 5 (filed April 14, 2003)[“Verizon Third NPRM Comments”]. See also Comments of Nextel Communications, Inc., ET Docket No. 00-258, at 11-12 (filed April 14, 2003)[“Nextel Third NPRM Comments”]; CTIA’s recognition of the viability of the 1910-1915/1990-1995 MHz band pairing is a welcome departure from its prior suggestion that the G Block creates the potential for interference to the existing PCS licenses.” See Comments of Cellular Telecommunications & Internet Ass’n, ET Docket No. 00-258, at 6-7 (filed Aug. 8, 2002).

⁶ See *Third NPRM* at ¶ 47.

Cingular, CTIA, Ericsson, Motorola and Verizon all agree with WCA that more than 10 MHz of separation is required to protect the broadband PCS use of 1930-1990 MHz.⁷

The broadband PCS interests have uniformly opposed the concept of imposing tighter out-of-band emissions limits on the licensee of the G Block to protect broadband PCS, and as a result WCA no longer suggests that a tighter restriction be imposed.⁸ Similarly, not one filer supported the imposition of more stringent out-of-band emissions limits on licensees at 1990-2000 to protect MSS operations. To the contrary, Motorola, Nextel and Ericsson agree with WCA's view that the existing spectral mask set forth in Section 24.238 of the Commission's Rules ($-43 + 10 \log (P)$) should be applied and oppose the imposition of additional technical rules to protect MSS/ATC at 2000-2020 MHz from interference from G Block base stations at 1990-1995/6 MHz.⁹ As Motorola recognizes:

There is also a potential for interference from PCS and "G" block base stations into MSS/ATC base station receivers. This situation is somewhat

⁷ See Cingular Third NPRM Comments at 8; CTIA Third NPRM Comments at 3-4; Ericsson Third NPRM Comments at 5-6; Motorola Third NPRM Comments at 4-6; Verizon Third NPRM Comments at 5-6. Note that while Verizon asserts that a 15 MHz separation is required (which would preclude the 1910-1916 MHz allocation suggested by WCA) it provides no support for that figure. See Verizon Third NPRM Comments at 6. By contrast, WCA has provided the Commission with detailed technical analysis to support its view that a 13.5 MHz separation is sufficient. See WCA Third NPRM Comments at 19. And, Motorola concedes that a reduction in the duplex gap of 5-6 MHz is feasible. See Motorola Third NPRM Comments, at 4.

⁸ See CTIA Third NPRM Comments at 5 ("if such rules were tight enough to protect adjacent PCS operations, they would unacceptably compromise the use of the band for CMRS or [AWS]"); Ericsson Third NPRM Comments at 4 (current Part 24 limits "are appropriate for the G band and have the advantage of establishing common out-of-band emissions limits, which facilitate the availability of equipment and speed the deployment of services"). See also Nextel Third NPRM Comments at 12 ("it will be unnecessary to impose out-of-band emissions ("OOBE") limits on Nextel that are more stringent than those currently applied to Broadband PCS handset transmissions below 1910 MHz").

⁹ See Motorola Third NPRM Comments at 6-7; See Nextel Third NPRM Comments at 15; Ericsson Third NPRM Comments at 4; WCA Third NPRM Comments at 21-22.

more manageable because base stations would be at fixed locations, which provides an opportunity to avoid interference through system design and/or coordination techniques when new MSS/ATC base stations are deployed. Compatibility can be achieved through physical separation between “G” Block and MSS/ATC base stations and/or by providing additional interference rejection in the MSS/ATC base station system design to account for signals at frequencies below 1995 MHz. Whichever approach is used, Motorola believes that there are workable solutions to provide the necessary interference mitigation between PCS and MSS/ATC systems. *Therefore, no additional technical rules are necessary to address potential interference between MSS/ATC and PCS/“G” Block base stations.*¹⁰

Finally, although a handful of parties have suggested that the Commission reallocate the entire 1910-1920 MHz band for voice and data versions of the so-called “Personal Handyphone” service, most recognize the Commission is likely to implement a voice-only Personal Handyphone service on the 1915-1920 MHz band, if at all.¹¹ It is worth noting, however, that none of these filings discuss the impact that a Personal Handyphone service would have on the use of the G Block for PCS-like offerings – indeed, Verizon opposes the proposal, noting that it could “cause significant harmful interference to licensed PCS services.”¹² Conversely, there is substantial support for WCA’s proposal that the 1916-1920 MHz band be used to expand the 1920-1930 isochronous Unlicensed Personal Communications Service band.¹³ Motorola, for instance, notes that “[t]here is already an extensive record supporting allowing isochronous devices to operate in the 1915-1920 MHz

¹⁰ Motorola Third NPRM Comments at 6-7 (emphasis added).

¹¹ See Comments of UTStarcom, ET Docket no. 00-258, at 1-2 (filed April 14, 2003); Comments of UTAM, ET Docket No. 00-258, at 4-5 (filed April 14, 2003); Comments of PHS MoU Group, ET Docket no. 00-258, at 2 (filed April 14, 2003); Comments of JSM Electronics, ET Docket No. 00-258, at 2 (filed April 14, 2003).

¹² Verizon Third NPRM Comments at 6. See also CTIA Third NPRM Comments at 5 n.7.

¹³ See, e.g. WCA Third NPRM Comments at 20-22; Verizon Third NPRM Comments at 6. Cingular Third NPRM Comments at 2.

frequency band” and that “in some areas, the demand for [isochronous] UPCS has reached saturation point.”¹⁴

II. OTHER THAN THE G BLOCK, NO VIABLE RELOCATION SPECTRUM FOR MDS HAS BEEN IDENTIFIED.

There is substantial agreement among a number of parties, including Cingular, Nucentrix Broadband Networks, Inc., DCT Los Angeles and Ad Hoc MDS Alliance, that the only viable relocation spectrum for MDS Channels 1 and 2/2A is the 1910-1916/1990-1996 MHz band.¹⁵ Moreover, the record developed in response to the *Third NPRM* reinforces what WCA has long been saying – MDS Channels 1 and 2/2A cannot be relocated on an unpaired basis to either the 1910-1920 MHz band or the 2155-2180 MHz band.¹⁶

As to the 1910-1920 MHz band, one commenting party has noted that “[if] used for TDD, the base-to-subscriber time portion of the TDD transmission would require guardbands on both sides of the band . . . [I]t should be recognized that they might have to be so large that they leave virtually no working spectrum.”¹⁷ Similarly, and again in agreement with WCA, CTIA’s comments establish that any unpaired allocation in the 2155-2180 MHz band “would create significant potential for harmful interference from TDD technologies to

¹⁴ Motorola Third NPRM Comments at 8-9.

¹⁵ See WCA Third NPRM Comments, at 12-28; Cingular Third NPRM Comments at 4-6; Comments of Nucentrix Broadband Networks, Inc., ET Docket No. 00-258, at 11-14 (filed April 14, 2003); Ad Hoc Third NPRM Comments at 4-5; Comments of DCT Los Angeles, ET Docket No. 00-258, at 14 (filed April 14, 2003)[“DCT Third NPRM Comments”]. It is worth noting that all of those commenting on the issue have recognized the merit of awarding MDS licensees flexible use authority, and no commenting party has opposed such an award. See, e.g., DCT Third NPRM Comments at 4-6.

¹⁶ See WCA Third NPRM Comments at 16-28.

¹⁷ See DCT Third NPRM Comments at 10.

planned AWS operations.”¹⁸ In addition, Cingular demonstrates that relocating MDS to 2170-2180 MHz as proposed in the *Third NPRM* will have a significant adverse impact on MSS licensees in the 2180-2200 MHz band.¹⁹

Accordingly, it comes as no surprise that commenting parties are recommending allocation of the 2155-2180 MHz band for other purposes. Like WCA, Cingular concludes that the band is best used either for base-to-customer AWS services or for benign low power services.²⁰ Along similar lines, CTIA, Motorola and Verizon all propose that the 2155-2180 MHz be used for AWS base-to-subscriber transmissions, with the 1710-1755 MHz band paired asymmetrically with the 2110-2180 MHz band.²¹ It should be noted that these proposals also eliminate ICO Global Communications (Holdings) Limited’s concern about

¹⁸ CTIA Third NPRM Comments at 6. *See also* DCT Third NPRM Comments at 11.

¹⁹ *See* Cingular Third NPRM Comments at 5; Verizon Third NPRM Comments at 5-6. Although WCA agrees with Motorola that the 2155-2180 MHz band is not appropriate relocation spectrum for MDS, WCA must take issue with Motorola’s suggestion that “[w]ith current MDS technology, a guardband of 3-5 MHz would be necessary between AWS and MDS spectrum. Motorola Third NPRM Comments, at 17. Admittedly, there may be scenarios where that is true. However, such a small guardband would clearly be inadequate to protect MDS response station hubs from interference caused by AWS base stations. As is discussed in detail in WCA’s comments in response to the *Third NPRM* and proved beyond peradventure by the technical studies by Marconi Wireless and LCC accompanying WCA’s filing, a separation in excess of 10 MHz is required to assure that AWS base station transmissions do not cause interference to MDS response station hubs. *See* WCA Third NPRM Comments, at 23-28. Indeed, WCA believes that Motorola essentially agrees with this assessment, since the very Motorola ex parte filing Motorola cites in support of its assertion specifically states that: “[d]epending on technology, guard band of 10 MHz of [*sic* should be “or”] greater would be required. *See* Letter from Steve B. Sharkey to Marlene H. Dortch, ET Docket No. 00-258, at Attachment, page 8 (dated Dec. 17, 2002).

²⁰ *See* Cingular Third NPRM Comments 6.

²¹ *See* CTIA Third NPRM Comments at 6-7; Motorola Third NPRM Comments at 14-15; Verizon Third NPRM Comments at 2. Motorola also raises the possibility that the Commission could hold the 2155-2180 MHz band in reserve for possible pairing with some other band that might be reallocated in the future. *See* Motorola Third NPRM Comments at 14-16.

the potential for interference to MSS/ATC if the 2155-2180 MHz band is used for transmissions from user terminals. That risk, of course, would exist if any part of the band were reallocated for MDS,²² and for that reason (among others) WCA concluded that TDD operations in the 2155-2180 MHz band are not feasible.

Lastly, of all the parties who filed comments in response to the *Third NPRM*, only one has proposed that MDS licensees be relocated somewhere other than the G Block. More specifically, the Commission has been asked to establish a paired allocation at 2020-2025/2175-2180 MHz and use that allocation for relocation of MDS, for Nextel or for AWS.²³ However, that proposal is flawed because it does not take account of the interference that relocated MDS stations would suffer at the hands of the Broadcast Auxiliary Service (“BAS”) immediately above 2025 MHz, and vice versa. The comments submitted by the Society of Broadcast Engineers addresses in detail the interference that could be caused to BAS from MDS at 2020-2025 MHz.²⁴ Moreover, as is discussed in the engineering statement of Kessler & Gehman annexed as Attachment A, were MDS relocated to the 2020-2025 MHz band, licensees would be required to use that band for subscriber-to-

²² See Comments of ICO Global Communications (Holdings), ET Docket No. 00-258, at 6 (filed April 14, 2003). ICO’s filing focuses extensively on the fact that much of the spectrum under consideration in this proceeding will not be available for reallocation if the Commission grants its petition for reconsideration of the *Third Report and Order* in this docket and the Commission’s decisions to strip certain MSS licensees of their licenses for failure to meet milestones. See *id.* at 2-3. While that is correct, it should be noted that even if the Commission reinstates the cancelled MSS licenses, there is no basis for restoring the 7 MHz of MSS spectrum in each direction that was never licensed and held in reserve. Thus, even if the milestone decisions are reversed, the 1990-1997 MHz band need not be returned to MSS and the G Block can still be implemented (so long as the Commission imposes appropriate restrictions on MSS/ ATC out-of-band restrictions to protect the G Block).

²³ See Ericsson Third NPRM Comments at 8.

base transmissions (to protect adjacent MSS/ATC operations at 2000-2020 MHz), but MDS base station receivers would be subject to destructive interference from BAS. That interference, which would result from both brute force overload and from BAS out-of-band emissions, would be uncontrollable. BAS licensees, by the very nature of the service, must be capable of operating their mobile news-gathering equipment throughout a given region, and thus there is no way to avoid situations in which a BAS licensee needs to operate either in close proximity to an MDS base station or with its transmission antenna aimed in the general direction of an MDS base station. Hence, WCA remains convinced that the 2020-2025 MHz band is best used either for low-power unlicensed operations²⁵ or, as proposed by Cingular, CTIA, Motorola and Verizon, for relocation of displaced Department of Defense users.²⁶

III. THE COMMISSION SHOULD NOT CAPITULATE TO NEXTEL'S DEMAND FOR A NATIONWIDE LICENSE AT 1910-1915/1990-1995 MHZ.

Without so much as even mentioning the discussion in the *Third NPRM* that the G Block could be used for relocation of MDS or presenting an alternative relocation plan of its own, Nextel repeats its demand for a nationwide license in the 1910-1915/1990-1995 MHz band, claiming that it is “a critical step in a plan to remedy CMRS-public safety interference

²⁴ See Comments of Society of Broadcast Engineers, ET Docket No. 00-258, at 3-4 (filed April 14, 2003).

²⁵ WCA notes that Motorola raises the possibility of using the 2020-2025 MHz band for TDD, but caveats that “the Commission would need to impose technical requirements that appropriately limit the potential for interference between operations in this band and the adjacent MSS/ATC uplink band, and these emission limits would significantly impact the usefulness of this spectrum.” Motorola Third NPRM Comments at 14.

²⁶ See Cingular Third NPRM Comments at 9; CTIA Third NPRM Comments at 6; Motorola Third NPRM Comments at 14; Verizon Third NPRM Comments at 8-9.

in the 800 MHz band.”²⁷ In so doing, Nextel again falls back on its tactic of refusing to address the substantial evidence to the contrary in WT Docket No. 02-55, apparently believing that its demand will acquire merit if repeated enough. WCA and a host of others have already proven otherwise without challenge from Nextel – simply put, any award of the 1910-1915/1990-1995 MHz band to Nextel remains an inferior public interest choice.

WCA’s filings on this issue are a matter of public record and thus need not be repeated in detail here.²⁸ As before, Nextel maintains that the 1910-1915/1990-1995 MHz band merely would be a *quid pro quo* for the hodgepodge of 700/800/900 MHz spectrum Nextel proposes to swap under its “consensus” plan to resolve the interference it is causing to public safety operations in the 800 MHz band.²⁹ Specifically, Nextel would have the Commission believe that a nationwide license for clear spectrum at 1910-1915/1990-1995 is

²⁷ Nextel Third NPRM Comments at 10.

²⁸ WCA requests that those filings be incorporated herein by reference. *See* Comments of Wireless Communications Ass’n Int’l, WT Docket No. 02-55 (filed Feb. 10, 2003) [“WCA 800 MHz Comments”]; Letter from Paul J. Sinderbrand, Esq., to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No 00-258, IB Docket No. 01-185, and WT Docket No. 02-55 (filed October 28, 2002); Letter from Wireless Communications Ass’n Int’l *et al.*, WT Docket No. 02-55 (filed Sept. 23, 2002); Letter from Wireless Communications Ass’n Int’l *et al.*, ET Docket No 00-258, IB Docket No. 01-185, ET Docket No. 95-18 and WT Docket No. 02-55 (filed Aug. 29, 2002).

²⁹ *See* Nextel Third NPRM Comments at 9-10. The Commission has already acknowledged that Nextel’s plan does not represent a “consensus,” and the record in WT Docket No. 02-55 confirms as much. *See, e.g., Public Notice*, “Wireless Telecommunications Bureau Seeks Comment on ‘Supplemental Comments of the Consensus Parties’ Filed in the 800 MHz Public Safety Interference Proceeding,” DA 03-19 (rel. Jan. 3, 2003) (stating that Nextel’s plan “does not represent a consensus reached by all parties participating in the WT Docket No. 02-55 proceeding”); WCA 800 MHz Comments at 1 n. 2 (citing parties to WT Docket No. 02-55 who have opposed or expressed reservations about Nextel’s proposal); Comments of Southern LINC, WT Docket No. 02-55, at 3 (filed Feb. 10, 2003) (stating that at least 33 public safety entities, 15 utilities and other critical infrastructure licensees, 8 B/ILT licensees, many SMR licensees and nearly every CMRS carrier other than Nextel have opposed the Nextel plan).

equivalent to (1) 4 MHz of Nextel's Guard Band spectrum in the 700 MHz band in certain markets (to be available exclusively for public safety),³⁰ (2) a "running average" of approximately 2.5 MHz of Nextel's spectrum in the 800 MHz band, and (3) a "running average" of 4 MHz of Nextel's spectrum in the 900 MHz band (to be available to 800 MHz B/ILT and SMR licensees who wish to relocate to that spectrum voluntarily).³¹ Upon closer examination, however, it becomes clear that Nextel's hodgepodge of 700/800/900 MHz spectrum cannot be equated with a nationwide license for clear spectrum at 1910-1915/1990-1995 MHz, and is in any case irrelevant to any resolution of the interference Nextel is causing to public safety operations in the 800 MHz band:

- Nextel's Guard Band spectrum at 700 MHz is burdened by encumbrances that render it unusable for public safety operations, and both the Commission and Nextel have acknowledged as much.³²

³⁰ See Joint Reply Comments of Aeronautical Radio, Inc., Nextel Communications, Inc. *et al.*, WT Docket No. 02-55, at 25 (filed Aug. 7, 2002) ["Joint Nextel Reply Comments"] (stating that "public safety gains access to 4 MHz of spectrum in 40 markets at 700 MHz").

³¹ See Nextel Comments at 8-9; Supplemental Comments of the Consensus Parties, Nextel Communications, Inc. *et al.*, WT Docket No. 02-55, at 13 (filed Dec. 24, 2002) ["Nextel Supplemental Comments"]; Reply Comments of Nextel Communications, Inc., WT Docket No. 02-55, at 8 (filed Aug. 7, 2002). As noted elsewhere, Nextel's "running average" concept effectively is a concession that Nextel's spectral holdings are not consistent from market to market, and thus for that reason alone are not comparable to a paired block of nationwide spectrum at 1910-1915/1990-1995 MHz. See, e.g., Further Comments of ALLTEL Communications, Cingular Wireless LLC, AT&T Wireless Services, Inc., and Coupe Communications, Inc., WT Docket No. 02-55, at 13 n. 47 (filed Sept. 23, 2002) ("For example, based on recent site-based data submitted by the FCC to Congress, Nextel does not have equal spectrum holdings throughout the top 100 markets in the United States – it holds as much as 23.35 MHz in one market (Scranton, PA) and as little as 2.85 MHz in another (McAllen, TX). Moreover, its spectrum holdings...are not contiguous.").

³² See *Improving Public Safety Communications in the 800 MHz Band (Notice of Proposed Rulemaking)*, 17 FCC Rcd 4873, 4899 (2002) ["Nextel/800 MHz NPRM"] ("In connection with the feasibility of the Nextel relocation proposal, we note that the 700 MHz Guard Band Block B spectrum to which Nextel proposes to relocate displaced 800 MHz licensees is heavily encumbered by incumbent television stations") (internal citations omitted); Comments of Nextel Communications, Inc., WT Docket No. 99-168 *et al.*, at 4 (filed May 3, (continued on next page)

Moreover, even if the spectrum were unencumbered, Nextel has already conceded that relocation of public safety operations to its 700 MHz Guard Band spectrum (thereby eliminating the Guard Band itself) would expose those facilities to harmful interference from adjacent CMRS operations.³³ Also, the Commission has recognized that “equipment for use in this band is not yet available,” and that, as noted above, Nextel does not hold the spectrum nationwide.³⁴

- Similarly, Nextel’s proposed surrender of some 900 MHz spectrum is superfluous because (1) Nextel does not hold the spectrum nationwide;³⁵ and (2) under Nextel’s current plan, B/ILT and high-site SMR licensees are not required to move to the 900 MHz band to retain co-primary status.³⁶ Indeed, the fact that B/ILT and SMR relocation to the 900 MHz band is optional is, by itself, a tacit admission by Nextel that its 900 MHz spectrum plays no meaningful role in its plan to reconfigure the 800 MHz band for the benefit of

2002) (“There are over 100 incumbent broadcast television stations operating in the upper 700 MHz band alone, and . . . these stations will likely continue to operate on this spectrum for years to come. This obviously prevents public safety systems from operating on this spectrum, and creates great uncertainty about when this band will be available for non-broadcast use.”).

³³ See Joint Nextel Reply Comments at 25 n. 69 (“Public safety use of the 700 Guard Band spectrum will, of course, be subject to TV station incumbency and *will be limited by interference potential from adjacent 700 MHz CMRS operations, absent a legislative change to the 700 MHz allocations.*”) (emphasis added). See also *Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission’s Rules*, 15 FCC Rcd 476, 491 (2000) (“We agree with commenters who contend that Guard Bands are the best way to ensure protection for public safety uses. In this Report and Order, we establish [the upper 700 MHz Guard Bands] in order to protect the immediately adjoining public safety licensees on Channels 63, 64, 68 and 69 from harmful interference.”).

³⁴ See *Nextel/800 MHz NPRM*, 17 FCC Rcd at 4899 (internal citations omitted); Comments of the American Public Transportation Association, WT Docket No. 02-55, at 2 (filed May 6, 2002) (“The proposed 700 MHz alternative is also unacceptable because there are currently no Transportation Management Systems using that band. In our view it would be unwise and inappropriate to expose public transit agencies and their 14 million daily riders to the risk and uncertainty associated with this unfamiliar and uncharted territory.”).

³⁵ See *Nextel/800 MHz NPRM*, 17 FCC Rcd at 4899 (internal citations omitted).

³⁶ See Nextel Third NPRM Comments at 8-9. Equally important, both Nextel and its supporters have emphasized that Nextel’s current funding commitment will be sufficient to cover any retuning of B/ILT and SMR licensees to new frequencies within the 800 MHz band, further obviating any need for those licensees to move to Nextel’s 900 MHz spectrum. See Nextel Supplemental Comments at 6.

public safety.³⁷ Ironically, Nextel underscores the point by noting that under its plan relocation will not be necessary for most 800 MHz B/ILT and SMR licensees,³⁸ and that relocation of those licensees to 900 MHz is not a desirable option.³⁹

In sum, both the record and Nextel's failure to address it reaffirm what has been evident for some time: Nextel's hodgepodge of 700/800/900 MHz spectrum cannot be compared to a nationwide license for clear spectrum at 1910-1915/1990-1995 MHz, and is immaterial to any resolution of the interference Nextel is causing to public safety operations at 800 MHz. By contrast, the public interest benefits of the MDS Industry Compromise are well documented, and that plan still remains the *only* workable solution to clearing the 2150-2162 MHz band and allowing an auction of the full 2110-2155 MHz band for AWS. WCA cannot emphasize this enough: acceptance of Nextel's disingenuous proposal, which at best

³⁷ In an eleventh-hour attempt to bolster its proposal, Nextel now contends that its swap of its 900 MHz spectrum is essential because it will purportedly "de-interleave" the 900 MHz band. Nextel Third NPRM Comments at 10. Nextel does not explain what this has to do with eliminating the interference it is causing to public safety operations in the 800 MHz band, nor does it explain how such "de-interleaving" can be achieved if B/ILT and SMR licensees are not required to move to Nextel's 900 MHz spectrum.

³⁸ See Nextel Supplemental Comments at 10 ("*Under the Consensus Plan, over 70% of all high-site SMR and B/ILT incumbent licensees would not be relocated; those that would be returned . . . would remain at 800 MHz*") (emphasis in original).

³⁹ *Id.* at 10 n. 15. ("Remaining at 800 MHz minimizes the cost and disruption of relocating [B/ILT and SMR licensees] since, in the vast majority of cases, their existing equipment can easily be retuned within the 800 MHz band."). Nextel's alleged "incentives" for B/ILT and SMR relocation are a non-starter. For example, although Nextel has offered to set aside \$150 million to fund the relocation of non-public safety licensees, it has explicitly refused to pay all the costs of relocating B/ILT or SMR licensees to its 900 MHz spectrum. See *id.* at 25. Furthermore, although Nextel is offering to give relocating B/ILT and SMR licensees a "two for one" channel bonus if they move to 900 MHz, that additional spectrum will not be available for years unless those licensees (1) elect to move within 60 days of the effective date of any Commission *Order* approving Nextel's proposal and (2) agree to forego any reimbursement of their relocation costs. *Id.* at 25-26; see also Nextel Third NPRM Comments at 8 n.22.

is just one of many ways the Commission can address the public safety interference problem, will preclude adoption of the MDS Industry Compromise to no one's benefit except Nextel.

IV. THERE IS NO SUPPORT IN THE RECORD FOR BLINDLY APPLYING THE EXISTING MICROWAVE RELOCATION POLICIES WITHOUT THE MODIFICATIONS NECESSARY TO MAKE RELOCATED MDS LICENSEES, SYSTEM OPERATORS AND SUBSCRIBERS WHOLE.

Throughout the course of this docket, not a single party has challenged WCA's assertion that the Commission's relocation policies were initially designed for displacement of point-to-point microwave facilities, and that those policies therefore must be substantially modified if displaced MDS licensees, their channel lessees and consumers are to be made whole.⁴⁰ The comments filed in response to the *Third NPRM* are similarly barren of any opposition to WCA on this point, and otherwise reflect no support for the Commission's suggestion that its microwave relocation policies for point-to-point services should be applied *verbatim* to MDS.⁴¹ Simply put, there is no factual or legal basis for the Commission to proceed down that road, and the agency will invite a substantial risk of judicial challenge (and, therefore, of reversal of its entire AWS allocation scheme) if it does otherwise.⁴²

V. CONCLUSION.

In sum, the record before the Commission leaves no doubt that the 1910-1916/1990-1996 MHz band remains the only viable spectrum for relocation of MDS licensees displaced

⁴⁰ See WCA Third NPRM Comments at 5-7; Comments of Wireless Communications Ass'n Int'l, ET Docket No. 00-258, at 49-52 (filed Feb. 22, 2001); Comments of Wireless Communications Ass'n Int'l on Further Notice of Proposed Rulemaking, ET Docket No. 00-258, at 10-14 (filed Oct. 22, 2001).

⁴¹ See *Third NPRM* at ¶¶ 71-72.

from 2150-2162 MHz for the benefit of AWS. Although Nextel continues to press for the G Block, it once again has failed to demonstrate that awarding Nextel is essential to curing the interference that Nextel causes to public safety entities in the 800 MHz band. Moreover, there is no evidence whatsoever in the record that refutes WCA's long-standing assertion that the Commission's microwave relocation policies must be substantially revised to reflect material differences between the nature of MDS and the other services to which those relocation policies have been applied. WCA therefore once again urges the Commission to adopt the MDS Industry Compromise as originally proposed, and thereby eliminate the cloud of uncertainty that has hung over the MDS Industry for over two years.

Respectfully submitted,

THE WIRELESS
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⁴² See, e.g., *Acherson Broadcasting Co. v. FCC*, 62 F.3d 1441, 1447 (D.C. Cir 1995), citing *Cities of Carlisle and Neola v. FERC*, 741 F.2d 423, 433 (D.C. Cir 1984) (agency not entitled to deference when it has "stopped shy of considering the disputed facts").

Interference Analysis and Technical Considerations
Between
TV Broadcast Auxiliary Services at 2025 – 2110 MHz Band
and
Proposed Advanced Wireless Services
Operations in the 2020 – 2025 MHz Band

Prepared For



By Kessler and Gehman Associates, Inc.

Introduction

Kessler and Gehman Associates, Inc. (“KGA”) has been retained on behalf of the Wireless Communications Association International, Inc. (“WCA”) to analyze technical issues associated with a proposal¹ submitted in response to the Third Notice of Proposed Rulemaking in ET Docket No. 00-258 to reallocate the 2020-2025 MHz band for subscriber-to-base transmissions paired with spectrum in the 2155-2180 MHz band for Advanced Wireless Services (“AWS”), relocation of the Multipoint Distribution Service or for use in connection with the resolution of the interference Nextel causes to public safety licensees in the 800 MHz band.

Background

KGA is a professional engineering firm, specializing in the design and evaluation of telecommunications systems for more than 40 years. The firm has been involved in virtually every phase of TV and FM broadcast, microwave communications, fiber optic, cable TV and wireless cable (MDS/ITFS), satellite earth stations, and two-way radio communications systems. The services rendered by KGA have ranged from consulting services on a daily basis to studies of technical and economic feasibility and the design and construction follow-up of major telecommunications systems in widely diverse geographical areas. In particular the firm has had extensive experience in the design of systems in geographical areas where special attention has had to be devoted to effects of meteorological variations on system propagation reliability. Baseband information carried on communications systems designed by the firm includes video, data, telemetry, supervisory, wide bandwidth audio, and telephone either in combination or individually.

The qualifications of the firm's key technical personnel are a matter of record with the Federal Communications Commission. KGA has represented many clients before the FCC in a variety of matters, including rule making and waiver requests of the Commission's rules to accommodate specialized telecommunications systems. While the firm maintains a continuous dialogue with equipment suppliers, contractors and manufacturers of television, radio and telecommunications equipment, its relationship to such companies is limited solely to the contacts necessary for the planning and implementation of systems for the firm's clients. The firm engages only in providing consulting services to its clients, and is thus not involved in the promotion, manufacture, sale or installation of any equipment. KGA or its personnel are members of the Wireless Cable Communications International, Inc. (“WCA”), the Association of Federal Communications Consulting Engineers (“AFCCE”), and the Institute of Electrical and Electronic Engineers (“IEEE”).

The Commission has requested comments on the feasibility of AWS operations in the 2020-2025 MHz band. As shown by Figure 1, the existing Broadcast Auxiliary Service (“BAS”) is allocated to the 2025 – 2110 MHz band immediately adjacent to the

¹ Comments of Ericsson, ET Docket No. 00-258

2020 – 2025 MHz band proposed for reallocation. Broadcasters license and utilize the BAS for Electronic News Gathering (“ENG”). TV Pickup licenses consist of Receive Only stations (referred to as “ENG R/Os”) and mobile facilities that transmit to the ENG R/Os. BAS-licensed areas allow mobile facilities (“ENG” trucks, helicopters, blimps, etc.) to setup and establish point-to-point links expeditiously to provide the public with real-time event driven information. Depending on the television market size there may be six or more ENG R/Os per market for each Broadcaster engaged in providing instant live coverage. Multiple R/O sites are needed to ensure that line-of-sight coverage is achievable from all parts of the market. In major markets such as Los Angeles, New York or Chicago, 18 or more geographically distributed ENG R/Os may be licensed to the major networks alone. Many major markets also have additional ENG facilities licensed to local cable news channels, smaller television stations, public broadcast stations, and other networks.

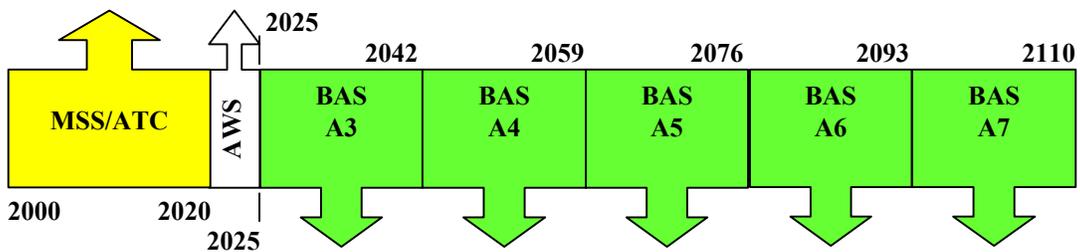


Figure 1. Band Plan from 2000 to 2110 MHz

Figure 1 also shows the 5 MHz channel proposed for reallocation is immediately adjacent to the MSS/ATC block frequencies used for subscriber-to-base transmissions (“uplink”). In order to coexist and not cause inter-service interference, AWS would have to operate under similar technical operational parameters as that of the MSS/ATC band to minimize the potential of inter-service interference. This can be accomplished when similar operational guidelines are maintained and when uplink frequencies are grouped together in a contiguous block and separated from a similarly grouped set of downlink frequencies. For purposes of this analysis, it is assumed that AWS operations at 2020-2025 MHz will conform to similar operational guidelines as MSS/ATC and will be paired with other AWS spectrum elsewhere below 2180 MHz. Interference between AWS and MSS/ATC is therefore manageable.

However, coexistence with Broadcast Auxiliary Services (“BAS”) at 2025-2042 MHz is problematic. The potential for interference from the 2020-2025 MHz band to BAS has been acknowledged at pages 3-4 of the comments submitted in response to the Third NPRM by the Society of Broadcast Engineers. However, interference from BAS channel A3 ENG operations to AWS operations at 2020 – 2025 MHz also must be examined and, as discussed below, presents the greatest interference challenge.

Interference Analysis Methodology

The methodology used in this report to judge whether the proposed 2020 – 2025 MHz band reallocation is suitable is to analyze the impact of brute force overload (“BFO”) and Out of Band Emissions (“OOBE”) levels from adjacent services.

Unacceptable levels of BFO will result in inoperable AWS base stations within 2 km of a BAS mobile unit. Unacceptable OOBE levels will result in degraded receiver performance, which equates to reduced coverage areas, dropped calls or sessions, the inability to make calls or connections and overall system performance degradation. The impact of BFO and OOBE can be minimized or eliminated by physical separation between a victim receiver and an interfering transmitter, although, as demonstrated below, such separation is not always practical in the real world.

The impact of BFO and OOBE levels will be evaluated by calculating the required physical separation distance between a victim receiver and an interfering transmitter in order to give a measurable impact to system performance. Brute force overload occurs when a receiver reaches saturation from an overwhelming signal, which it is unable to reject. For purposes of this analysis, OOBE interference occurs when a victim receiver's noise floor is degraded by more than 1 dB from an interfering transmitter. The 1 dB degradation criteria was chosen because this represents a significant reduction in the potential coverage area of a communications system.

Interference from BAS / ENG Mobile Facilities

To cover news, traffic, weather, cultural, and sporting events throughout a market area, ENG mobile facilities routinely setup at unpredictable locations within their licensed area of operation to broadcast live reports back to the broadcaster's studio. These mobile facilities are typically configured with 10 - 12 watt transmitters, which are mounted on a telescoping mast to eliminate feed-line loss. The gain of transmitting antennas used on mobile units depends on the type of mobile unit (vehicle in motion, vehicle parked, or portable tripod) and the distance between the mobile unit and the R/O site, but the gain ranges from 13 dBi to 25 dBi, with a typical unit using a 20-dBi gain and a beamwidth of about 12 degrees. ET Docket No 01-75 R&O part 74.636 limits the transmitter power output to 12 watts and the EIRP to a maximum of 35 dBW (3,162 watts) for BAS mobile operations emanating from the ENG facilities². The resulting signal power from the ENG facility is the equivalent of a high-powered downstream broadcast facility on wheels (or wings in the case of helicopters and blimps) with an ability to setup unpredictable transmissions at any location, in any direction, and at any time within a market.

Because the BAS band and BAS channel A3 located at 2025 – 2042 MHz are effectively mobile downstream high power channels and are adjacent to the 2020 – 2025 MHz band proposed for reallocation, BAS ENG facilities present a potential for interference to AWS by both A) brute force overload and B) desensitization to AWS cellular base station operations in the 2020-2025 MHz band.

² As a point of reference, an EIRP of 35 dBW is 2dB (1.58 times) higher than the maximum allowable EIRP for a high powered MDS broadcast facility.

Analysis A:

Brute Force Overload to AWS Subscriber-to-Base Station operations

As identified in Figure 2 below, the required distance between an ENG mobile unit transmitting with an EIRP of 35 dBW on channel A3 and transmitting in the direction of a 2020 – 2025 MHz AWS base station utilizing “cdma 2000” technology engaged in subscriber-to-base operations is more than 2 km. Since the beamwidth of an ENG transmitting antenna is about 12 degrees wide, there would be a sector with a 0.4 km arc with a radius of 2 km within which interference would be caused to an area of more than 0.4 square kilometers. Since numerous AWS base stations would be located throughout the ENG market area, there is a clear and apparent threat of harmful interference from BAS / ENG transmissions to AWS base stations.

| Brute Force Overload – BAS Mobile to AWS Base Stations | |
|--|---------|
| BAS EIRP in dBW (35 dBW adjusted to 5 MHz bandwidth) | 29.685 |
| BAS EIRP converted to dBm | 59.685 |
| AWS Receiving Antenna Gain in dBi | 15.000 |
| AWS Receiver Blocking in dBm | -30.000 |
| Attenuation Required in dB, to avoid Brute Force Overload to AWS from BAS [EIRP + Gain – Receiver Blocking] | 104.685 |
| Minimum Spacing - Distance Required in meters | 2,016 |
| Minimum Spacing - Distance Required in feet | 6,614 |

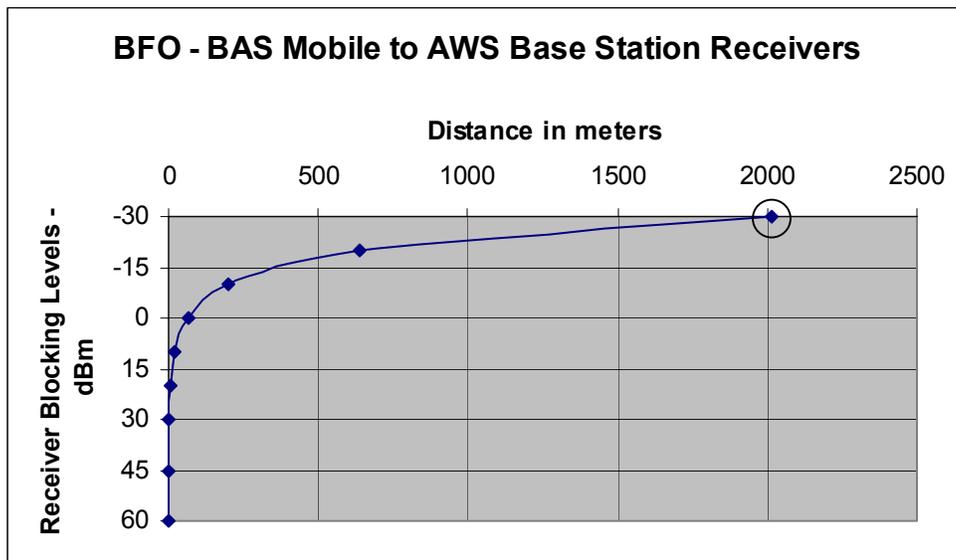


Figure 2- Brute Force Overload to AWS Base Stations.

Analysis B:

Desensitization to AWS Subscriber Base Stations:

ET Docket No 01-75 R&O part 74.637 Emissions and emission limitations (iii) requires that BAS transmitters adhere to the following:

- “(i) On any frequency removed from the assigned (center) frequency by more than 50% up to and including 100% of the authorized bandwidth: At least 25 dB in any 100 kHz reference bandwidth (BREF);
- (ii) On any frequency removed from the assigned (center) frequency by more than 100% up to and including 250% of the authorized bandwidth: At least 35 dB in any 100 kHz reference bandwidth;
- (iii) On any frequency removed from the assigned (center) frequency by more than 250% of the authorized bandwidth at least $43 + 10 \text{ Log}_{10} (P \text{ mean in watts})$ or 80 dB, which ever is the lesser attenuation, in any 100 KHz reference bandwidth”.

In summary, the maximum allowable OOB radiated into the AWS channel from BAS channel A3 would be 10 dBW (40 dBm)³, from BAS channel A4 would be 0 dBW (30 dBm), and from BAS channels A5, A6, and A7 would be -18.79 dBW (11.21 dBm)⁴. In order to determine desensitization to an AWS base station engaged in subscriber to base operations at 2025 MHz, the ENG mobile transmitter OOB TPO and antennae gain is required to be understood. As discussed above, the BAS mobile transmitter is typically directly connected to a 20-dBi-gain antenna, which would result in an OOB EIRP ranging from 35.79 dBm on BAS-channel A3, 25.79 dBm on channel A4, and 7 dBm on channels A5, A6 and A7. An AWS base station engaged in subscriber-to-base operations in the 2020 – 2025 MHz band would typically use a 15-dBi gain antenna. Based on these data, the attenuations required to protect the AWS base station noise floor against a 1-dB degradation are shown on Figure 3.

| Receiver Desensitization – BAS Mobile to AWS Base Stations | | | |
|---|-------------------|-------------------|----------------------------|
| | Channel A3 | Channel A4 | Channels A5, A6, A7 |
| BAS OOB EIRP in dBm | 35.79 | 25.79 | 7.00 |
| AWS Receiving Antenna Gain in dBi | 15.00 | 15.00 | 15.00 |
| AWS Noise Floor (5 MHz) in dBm | -107.00 | -107.00 | -107.00 |
| Limit for a 1 dB increase in Noise Floor in dB | <u>6.00</u> | <u>6.00</u> | <u>6.00</u> |
| Attenuation Required in dB, to avoid increasing the AWS Noise Floor by more than 1 dB, from BAS [EIRP + Gain – (Noise Floor – 6 dB)] | 163.79 | 153.79 | 135.00 |
| Minimum Spacing - Distance Required in km | 1,811 | 568 | 64.7 |
| Minimum Spacing - Distance Required in miles | 1,125 | 353 | 40.2 |

³ For example, an EIRP of 35 dBW could be created from a TPO of 12 watts (10.79 dBW) and an antenna gain of 24.21 dBi. A TPO of 10.79 dBW minus 25 dB OOB attenuation equals -14.21 dBW, plus a 24.21 dBi antenna gain equals an OOB of 10 dBW (40 dBm). A more typical OOB might be created from a TPO of 12 watts (10.79 dBW) and an antenna gain of 20.00 dBi such that a TPO of 10.79 dBW minus 25 dB OOB attenuation equals -14.21 dBW, plus a 20.00 dBi antenna gain equals an OOB of 5.79 dBW (35.79 dBm).

⁴ For example, an EIRP of 35 dBW could be created from a TPO of 12 watts (10.79 dBW) and an antenna gain of 24.21 dBi. A TPO of 10.79 dBW minus [43 + 10Log₁₀(12W)] 53.79 dB OOB attenuation equals -43 dBW, plus a 24.21 dBi antenna gain equals an OOB of -18.79 dBW (11.21 dBm). A more typical OOB might be created from a TPO of 12 watts (10.79 dBW) and an antenna gain of 20.00 dBi such that a TPO of 10.79 dBW minus 53.79 dB OOB attenuation equals -43 dBW, plus a 20.00 dBi antenna gain equals an OOB of -23 dBW (7 dBm).

Figure 3. Desensitization to AWS Base Station Receivers.

Assuming the AWS subscriber to base station is within line of sight, the required distance between an ENG mobile unit transmitting in compliance with part 74.637 and an AWS 2020 – 2025 MHz base station ranges from 64.7 to 1,811 km. Of course, the distances required on channel A3 and A4 are far beyond line-of-sight, which means it is not at all possible for AWS to coexist with BAS operations on channels A3 and A4. Indeed the separation of 64.7 km required from ENG mobile units on the rest of the BAS channels is too large to be of any practical use.

Conclusions

In summary, BAS facilities located at 2025 – 2110 MHz are effectively mobile high power downstream channels that may operate anywhere at anytime in the ENG R/O licensed areas. Under the proposed reallocation of 2020 – 2025 MHz, AWS would be utilized for subscriber-to-base station communications throughout the same area thus making coordination between AWS and BAS impossible. In addition, guard bands cannot be implemented to reduce the likelihood of interference given the lack of any spectrum between the proposed AWS 5 MHz channel at 2020 – 2025 MHz, MSS/ATC at 2000 – 2025 MHz and BAS at 2025 to 2110 MHz. BAS is utilized in a fashion that cannot possibly protect cellular base stations in the 2020 – 2025 MHz band. For the reasons given above the 2020 – 2025 MHz band is not suited for AWS subscriber-to-base station operations.

This engineering statement has been prepared by or under the direct supervision of Robert Gehman, Jr., who states under penalty of perjury that he is a professional engineer registered in the states of Florida, Maryland and Mississippi, he is president of Kessler and Gehman Associates, Inc., and the information contained in this statement is true and correct to the best of his knowledge and belief.

KESSLER AND GEHMAN ASSOCIATES, INC.



Robert Gehman, Jr., P.E.
President

April 28, 2003