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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
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	)	ET Docket No. 00-258
	)	
Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use By the Mobile-Satellite Service	)	ET Docket No. 95-18
	)	
The Establishment of Policies and Service Rules for the Mobile-Satellite Service in the 2 GHz Band	)	IB Docket No. 99-81
	)	
Petition for Rule Making of the Wireless Information Networks Forum Concerning the Unlicensed Personal Communications Service	)	RM-9498
	)	
Petition for Rule Making of UTStarcom, Inc., Concerning the Unlicensed Personal Communications Service	)	RM-10024

To: The Commission

REPLY COMMENTS OF
NEC AMERICA, INC.

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To: The Commission

REPLY COMMENTS OF
NEC AMERICA, INC.

NEC America, Inc. ("NEC") hereby submits reply comments in response to the Further Notice of Proposed Rulemaking (the "FNPRM") released by the Federal Communications Commission (the "FCC" or the "Commission") on August 20, 2001 in the above-captioned proceeding. 1/

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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 Services*, ET Docket No. 00-258, Memorandum Opinion and Order and Further

I. Introduction and Summary

As explained in its initial comments, NEC strongly urges the Commission not to reallocate the 1910-1930 MHz band for third generation mobile ("3G") or other services. After reviewing the comments of other parties in this proceeding, NEC is not surprised that the vast majority of commenters addressing issues related to this band agrees that the band is inappropriate for reallocation and could best be utilized by maintaining the current allocation for unlicensed PCS ("UPCS"), albeit with some minor amendments to the operational rules, as suggested by the WINForum and UTStarcom petitions. 2/

Despite the broad consensus among the commenting parties, NEC nevertheless is concerned that a few commenters suggest that the 1910-1930 MHz band should be reallocated either for advanced mobile services or for MDS. Of these commenters, only one offers *any* suggestion – albeit an entirely insupportable one – regarding where and how the incumbent UPCS users could be relocated. In the discussion below, NEC explains that these few commenters misunderstand both the operational realities of the 1910-1930 MHz band and the Commission's governing policy considerations in reallocation and relocation decisions.

Notice of Proposed Rulemaking, FCC 01-224 (rel. Aug. 20, 2001) ("FNPRM"). NEC filed initial comments responding to the FNPRM on October 22, 2001 ("NEC Comments"). NEC develops, manufactures and markets a complete line of advanced communications products and software for public and private networks, including Private Branch Exchange ("PBX") systems and key telephone systems that incorporate an integrated wireless component using UPCS spectrum.

2 *See* Wireless Information Networks Forum, Amendment of the Commission's Rules for Unlicensed Personal Communications Services, Petition for Rulemaking, RM-9498 (Jan. 8, 1999); UTStarcom, Inc., Amendment of the Commission's Rules for Community Wireless Telecommunications Networks,

II. The 1920-1930 MHz Band Is Currently Being Used Extensively for UPCS and Greater Use of the Entire 1910-1930 MHz Band Could Be Fostered by Adoption of the WINForum and UTStarcom Proposals

A. The 1920-1930 MHz Band Is in Active Use by the Rapidly Growing UPCS Industry

Although still in its early years, UPCS operations in the 1920-1930 MHz band already boast hundreds of thousands of individual users, many of whom provide important public safety services, and is growing more rapidly than licensed PCS.3/ This growth has come despite midstream changes in the spectrum allocation, the presence of complex and severely limiting operational rules, and a spectrum landscape that is still a few years away from being completely unencumbered by existing microwave users. Given these obstacles, it is disingenuous for other commenters to suggest that the UPCS "market expectations have failed to materialize."4/ To the contrary, industry growth through the first quarter of this year has been right on target with the expectations originally forecast and filed with the Commission in 1994.5/

B. Proposals by WINForum and UTStarcom Would Increase the Use of the Band

Although UPCS is a rapidly growing service, a few concrete steps should be taken by the Commission to accelerate that growth further and provide for a more

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Petition for RuleMaking, RM-10024 (Nov. 6, 2000).

3 *See* NEC Comments at 10 (citing 31% growth rate for UPCS in 2000).

4 ArrayComm Comments at 5.

5 *See* UTAM, Inc., "UTAM Plan for Financing and Managing 2 GHz Microwave Relocation," filed in GEN Docket No. 90-314 (Aug. 1, 1994) at Attachment H.

efficient and intensive use of the spectrum in the 1910-1930 MHz band. First, the Commission should grant the WINForum petition to permit isochronous operations in the 1910-1920 MHz band. Despite claims that the 1920-1930 MHz band is underutilized, UPCS providers are already experiencing capacity limitations in certain areas, especially for the provisioning of service to high-density users and in multi-tenant buildings.6/ Permitting an expansion of isochronous operations into the neighboring UPCS sub-band would help satisfy this unmet demand for voice and data UPCS service and increase the usefulness of the 1910-1920 MHz band.

There is widespread support for the WINForum proposal among the commenters.7/ Only ArrayComm, Inc. ("ArrayComm") attempts, feebly, to argue against the WINForum petition. ArrayComm states that the WINForum proposal would leave the band under the management of UTAM. It also states that "the composition of UTAM's membership is not a matter of public record, but it is generally accepted that it includes operators and manufacturers who are influential in the operation, design and supply of PCS systems." Presumably, therefore, ArrayComm believes that the WINForum proposal is unwarranted because it does nothing to limit the impact of UTAM's alleged bias in favor of PCS operators. This already tenuous argument falls apart completely when one considers that the

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6 *See* Nortel Networks Comments at 4; UTAM Comments at 13; NEC Comments at 25; Avaya Comments at 5.

7 Rural Telecommunications Group Comments at 5; Nortel Networks Comments at 3; Blackfoot Telephone Cooperative Comments at 2; Midstate Communications Comments at 2; Midvale Telephone Exchange Comments at 2; Nortel Networks at 3; Penasco Valley Telephone Cooperate Comments at 2; UTAM Comments at 12.

UTAM's membership is, in fact, a matter of public record filed with the FCC, and that the overwhelming majority of UTAM's members are not associated with the PCS industry. 8/ The Commission should ignore this lone and misguided opposition to the WINForum proposal and act in the public interest to permit a more efficient use of the 1910-1920 MHz band.

As a second step to improve the use of spectrum in the 1910-1920 MHz band, the Commission should adopt UTStarcom's proposal to permit low power, unlicensed limited area "community wireless networks" that will promote the cost effective provision of wireless communications to rural areas, tribal lands and other underserved communities. Of the many commenters that addressed the proposal, not one commenter was opposed.

The grant of the WINForum and UTStarcom proposals would do more to lead to the efficient use of the 1910-1930 MHz band than any reallocation that necessarily would include 10 MHz of fallow guard band spectrum, as discussed below in section IV.B. Because the proposals are non-controversial, the Commission should bifurcate this proceeding so that it can resolve the issues relating to the 1910-1930 MHz band expeditiously, rather than wait for a resolution of all the other, more complex issues in the proceeding.

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8 *See, e.g.*, "UTAM Report to the FCC," GEN Docket 90-314 (July 1, 2001) at Appendix A (containing list of members). As evidenced by prior history, neither UTAM nor WINForum are in the pockets of the PCS industry.

III. As Currently Allocated, the 1910-1930 MHz Band Serves a Critical Guard Band Function

As currently allocated, the 1910-1930 MHz band is an example of good spectrum management. The band serves two purposes: it protects the neighboring PCS licensees from interference while at the same time permitting the development of a new industry that provides interference-free wireless communications for public safety and other enterprise users. This "dual use" of the band is possible because UPCS is a low power service. Any attempt to squeeze a high power service such as MDS or 3G into the band would negate the spectral efficiencies of the current allocation. Thus, the Commission should maintain the current allocation in the band in order to preserve the careful balance between protection of licensees and the promotion of new wireless services. Of course, the Commission can still improve upon the existing efficiencies by providing for additional flexibility in the band, as described above in Section II.B.

IV. Introducing High Power Services Into the 1910-1930 MHz Band Would Require a Costly Relocation, Would Create Interference with Neighboring Licensees and Would Harm Public Safety and Other Microwave Users

A. Introducing High Power Services into the 1910-1930 MHz Band Would Require a Costly Relocation of UPCS Users

Few commenters recommending reallocation of the 1910-1930 MHz Band for 3G or MDS bothered to consider the effects of such operations on UPCS users. In fact, UPCS systems cannot share a band with 3G or MDS operations. The listen-before-talk spectrum etiquette required by the FCC's rules for UPCS devices means

that any interference from other operations would effectively silence the UPCS systems. The Commission should pay careful attention to the comments of Motorola, which provide a detailed engineering analysis illustrating that sharing the 1910-1930 MHz band between UPCS and 3G or MDS operations is not technically feasible.9/ A reallocation, then, is tantamount to a relocation of UPCS users.

Assuming the Commission abides by its relocation compensation policies established in the Emerging Technologies docket, a reallocation would be an expensive proposition for the new users (or those paying the new users' relocation costs). Despite the wishful thinking of the Ad Hoc MDS Alliance ("MDS Alliance"), it is unlikely that any UPCS device can be "retuned" to operate at distant frequencies such as 2390-2400 MHz, 10/ meaning that a relocation will render all existing equipment worthless. Given that equipment costs for UPCS systems average over $1,000 per user, and that there are hundreds of thousands of existing users, replacement costs could run into the hundreds of millions of dollars. Reimbursement also would be required for the $60 million that the UPCS industry has already spent in clearing the 1910-1930 MHz band of incumbent microwave users.

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9 *See* Motorola Comments at 18-19, Appendix A.

10 *See* MDS Alliance Comments at 20 (suggesting that incumbents of the 1910-1930 MHz band relocate to 2390-2400 MHz, representing more than a 450 MHz shift in frequency).

B. *Reallocation Would Result in Interference to Neighboring Bands Unless Empty Guard Bands Are Established*

A review of the comments makes one thing exceedingly clear: there is a near unanimous consensus that neither advanced mobile systems nor MDS systems can operate across the full 20 MHz of the 1910-1930 MHz band without causing interference to neighboring PCS operations.11/ The comments of Motorola and Verizon Wireless, for example, describe multiple technical studies that conclude that the placement of either time division duplex ("TDD") mobile systems or MDS operations adjacent to existing frequency division duplex ("FDD") mobile systems would result in harmful interference.12/ Similarly, the FCC previously determined that a 4 MHz guard band would be necessary between MDS and 3G PCS systems.13/ Indeed, even the few proponents of reallocation, including the Ad Hoc MDS Alliance, ArrayComm, and Cingular Wireless ("Cingular"), recognize that a portion of the 1910-1930 MHz band would have to be set aside as guard bands or otherwise encumbered with operating restrictions. 14/ In short, nothing in the comments contradicts these assessments of likely interference.

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11 *See* ArrayComm Comments at 7; Avaya Comments at 10; CTIA Comments at 3; Cingular Comments at 12-13; Motorola Comments at 15; Nortel Networks Comments at 4; UTStarcom Comments at 4; Verizon Wireless Comments at 9-10; WINForum Comments at 9-10.

12 *See* Motorola Comments at 15-18; Verizon Wireless Comments at 9-10.

13 Federal Communications Commission, *Spectrum Study of the 2500-2690 MHz Band, The Potential for Accommodating Third Generation Mobile Systems,* Staff Report, DA 01-786 (rel. Mar. 30, 2001) at 27. Verizon notes that the Staff Report failed to address the potential for interference to 3G mobile devices, suggesting that a larger guard band would be needed. See Verizon Wireless Comments at 9.

14 *See* MDS Alliance Comments at 24; ArrayComm Comments at 7; Cingular Comments at 13.

Commenters suggest that at a minimum, 5 MHz on each edge of the band – i.e., one-half of the entire band – would be needed as guard bands. Even this amount, however, may not be sufficient to prevent interference. Motorola, for example, points to ITU documents indicating that without filtering and close coordination between adjacent FDD and TDD systems, guard bands of 15 MHz would be required.15/ Moreover, as AT&T Wireless, CTIA and others point out, the need for even small guard bands leaves too little usable spectrum to make the 1910-1930 MHz band useful for 3G services. 16/

The necessity for large guard bands means that a reallocation of the band would result in grossly inefficient use of spectrum. Even the MDS Alliance, which favors relocation of MDS to the 1910-1930 MHz band, admits that guard bands represent fallow spectrum. 17/ To avoid wasting spectrum this way, it suggests – with a bit of wishful thinking and a lot of self interest – that the imposition of operational limitations at the band's edges could permit MDS operators some degree of use throughout the entire band. At the same time, MDS Alliance argues that even with use throughout the full 20 MHz of the band, MDS operators "would not truly enjoy a material increase" over their existing 12 MHz spectrum

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Cingular unrealistically suggests that incumbents can continue to operate in the guard bands, representing only one-half the amount of spectrum as before. UPCS systems already face capacity limitations. *See* Nortel Networks Comments at 4; UTAM Comments at 13; NEC Comments at 25; Avaya Comments at 5. Reducing the UPCS spectrum available would render many products, including NEC's, commercially nonviable.

15 *See* Motorola Comments at 16.

16 *See* AT&T Wireless Comments at 3; CTIA Comments at 3.

allocation. /18 MDS Alliance cannot have it both ways: either parts of the band will lie fallow under its proposal *or* MDS operators will reap a windfall of additional usable spectrum.

When evaluating commenters' requests for reallocation of the 1910-1930 MHz band, the Commission should keep in mind the that it is charged by Congress to promote the "efficient and intensive use of spectrum."19/ Clearing a band of incumbent users just to allocate half of it to serve as an inactive guard band is clearly contrary to this objective.

C. Incumbent Public Safety Users Could Be Severely Impacted

The band clearing process begun in the mid-1990s has not finished. If allowed into the 1920-1930 MHz band, high power services such as advanced mobile or MDS systems would find it harder than low power UPCS systems to work around the remaining incumbent microwave users. Many of these remaining incumbents are public safety users. Under the FCC's relocation rules, public safety licensees enjoy a three year voluntary negotiation period, followed by a two year mandatory relocation negotiation period. The Association of Public-Safety Communications

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17 *See* MDS Alliance Comments at 25.

18 *Id* In addition to gaining a larger allocation, NEC notes that the lower frequencies at 1910-1930 MHz will provide MDS operators with signal propagation that is superior to their current allocation at 2150-2162 MHz.

19 47 U.S.C. § 309(j)(3)(D).

Officials-International ("APCO") strongly opposes any relaxation of relocation rules relevant to public safety licensees.20/

To date, UPCS operators have been able to coexist with the public safety users, which are comfortable with the protection afforded by UTAM's coordination process. The introduction of high power, large footprint systems in the band likely would require the relocation of these public safety users. Due to the relocation cost caps contained in the Commission's rules, the relocation costs of microwave incumbents oftentimes are not fully reimbursed. If, considering the significant burdens under which they operate, public safety agencies have to divert scarce budget resources to relocation expenses, public safety operations could be negatively impacted.

V. The Commission Must Consider the Effects of Relocation on Incumbent Users

MDS Alliance proposes that the hundreds of thousands of existing UPCS users in the 1910-1930 MHz band be forced to relocate to the 2390-2400 MHz band. 21/ Moreover, MDS Alliance brazenly suggests that the disruption and costs caused to UPCS users as a result of the relocation need not be considered because the users are not household consumers of communications services, but are companies that view the spectrum "not as their business but as a means to support

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20 *See* APCO Comments at 4.

21 MDS Alliance stands alone in its call for the relocation of UPCS to the 2390-2400 MHz band. No other MDS commenter advocates either relocation of MDS operations to the 1910-1930 MHz band, or the relocation UPCS users to 2390-2400 MHz.

their business." 22/ Thus, according to MDS Alliance, "the disruption of moving to new spectrum is a secondary financial burden to these companies."23/ MDS Alliance cites no Commission precedent for this novel position – because no such precedent exists. In fact, as NEC detailed in its initial comments, the Commission has a policy of considering (and striving to minimize) the disruptive impact that relocation decisions have on all incumbent users. 24/ The Commission makes no distinctions in this regard based on the users' residential or commercial status. Moreover, the Commission is particularly sensitive to the impact that relocations may have on public safety workers, 25/ such as the many doctors and nurses who rely on UPCS for mission-critical communications.26/

MDS Alliance also argues that the users of the 1910-1930 MHz band have no legal expectancy of its continued availability because the band is governed by Part 15 of the Commission's rules. MDS Alliance attempts to base this argument on section 15.5, which states that "Persons operating intentional or unintentional radiators shall not be deemed to have any vested or recognizable right to continued

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22 By contrast, MDS Alliance is concerned that MDS equipment manufacturers not be inconvenienced by having to reconfigure their equipment designs as a result of relocation. *See* MDS Alliance Comments at 24.

23 *Id.* MDS Alliance proposes that incumbents be allowed to use their equipment for up to five years to allow for depreciation, but during this period may not expand their systems to accommodate more users or additional areas of their facilities. *See* MDA Alliance Comments at 30. In reality, Federal tax depreciation schedules often bear little relationship to the actual useful life expectation that the purchaser had when investing in the product.

24 *See* NEC Comments at 7, 14-15.

25 *See* NEC Comments at 8.

26 *See* Nortel Networks Comments at 4; Avaya Comments at 5-7; NEC Comments at 8-9.

use of any given frequency *by virtue of prior registration or certification of equipment . . . ."* 27/ Unlike most operations under Part 15, the Commission set aside a specific allocation for UPCS and established detailed service rules. Moreover, the UPCS industry has paid for the relocation of incumbent microwave users in the band. Thus, UPCS operators have a legitimate expectancy to operate in the band specifically allocated for UPCS, and do not attempt to rely on equipment certifications to establish their rights.

As Avaya, UTAM, WINForum and NEC note, a relocation of UPCS to another band could have disastrous effects at this early stage of UPCS development and could even lead to the collapse of the industry, as both users and equipment manufacturers lose confidence in the FCC's commitment to the service and seek to cut their losses by exiting the market. This would be especially true if MDS Alliance were successful in shrinking the total spectrum allocated for UPCS from 30 MHz down to 10 MHz by relocating all UPCS to 2390-2400 MHz, as it proposes. 28/ MDS Alliance's plan would further constrict the ability of UPCS manufacturers to meet the demands of high-density and multi-tenant building users and would require the development and installation – at staggering cost – of all new equipment that could operate in the higher band.

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27 47 C.F.R. § 15.5(a) (emphasis added).

28 This relocation would allow MDS operators currently occupying 12 MHz of spectrum at 2150-2162 MHz to take over the 20 MHz of the 1910-1930 MHz band, the majority of which has been cleared of incumbent microwave users at great expense by the UPCS industry. MDS Alliance makes no mention of plans to compensate UTAM and its members for the $60 million that has been spent on these microwave relocations.

A collapse of the industry brought on by such a commercially devastating relocation would present current users of UPCS with a significant disruption, leave them with no replacement product that provides an equal assurance of interference-free operation, and provide a windfall to one company – SpectraLink – by reducing significantly the competition it faces.

Members of the MDS Alliance no doubt benefited from the Commission's decision in 1993 not to relocate the then-nascent MDS channels at 2 GHz, stating that MDS "should be afforded sufficient time to develop."29/ The UPCS industry now asks for the same consideration. Accordingly, the Commission should reject the outlier proposal of the MDS Alliance for what it is – a transparent attempt to obtain more (and more valuable) spectrum without any regard to the enormous financial and operational burdens that would be imposed upon UPCS users and equipment manufacturers.

VI. Conclusion

In accordance with the widespread consensus among the commenters, the Commission should not reallocate the 1910-1930 MHz band for either 3G or MDS operations. Such high power use of the band would require substantial guard bands to protect neighboring PCS licensees, thereby resulting in a grossly inefficient use of spectrum. Moreover, relocation of the 1910-1930 MHz band would be costly, would

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29 *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, First Report and Order and Third Notice of Proposed Rulemaking, 7 FCC Rcd 6886, 6889 (¶17) (1993).

negatively impact public safety users, and could result in the collapse of a substantial section of the UPCS industry. Significantly, only one lone commenter has presented any analysis of the possible relocation of UPCS, and its suggestions are wholly inconsistent with prior Commission precedent and notions of fair play. Therefore, the Commission should maintain the current allocation for UPCS devices, but make minor amendments to the operational rules to permit greater and more flexible use of the UPCS band, as suggested by WINForum and UTStarcom.

Respectfully submitted,

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