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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

COMMENTS OF
NEC AMERICA, INC.

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SUMMARY

NEC America, Inc. ("NEC") manufacturers and markets private branch exchange ("PBX") and key telephone systems that incorporate wireless handset capabilities using spectrum allocated for unlicensed PCS ("UPCS") devices in the 1920-1930 MHz band. NEC strongly urges the Commission not to reallocate this band for third generation mobile ("3G") or other services, as doing so would undermine competition in the wireless PBX market and reduce drastically the communications options available to enterprise users. Equally important, unlike previous Commission reallocation decisions, a reallocation in this band would leave end user customers with worthless equipment, including hundreds of thousands of mobile handsets that are less than five years old and were acquired at a cost of at least several hundred dollars each.

A reallocation of the 1920-1930 MHz band would necessarily mean a relocation because UPCS devices need clear spectrum, as the Commission has previously recognized, particularly in light of the listen-before-talk spectrum etiquette required for UPCS. Contrary to Commission policy, a relocation would cause a serious disruption to existing users, including the many hospital doctors and nurses who rely on wireless PBXs to improve patient care.

Contrary to the suggestion in the FNPRM, deployment of UPCS has grown at an impressive rate, especially considering the delays caused by the Commission's reallocation decision in 1994 and the lack, until 1998, of a workable

cost sharing formula for band clearing. Nevertheless, UPCS is still a nascent industry and, consistent with prior Commission policy, should not be targeted for relocation while still in its critical developmental stage. A reallocation coming after only a few years of operations would prevent manufacturers and end-user enterprises from recouping their investments. If faced with a second reallocation in less than 10 years, manufacturers would have to seriously re-evaluate the wisdom of remaining in the UPCS market. A market exit by UPCS manufacturers would harm competition by virtually handing over the entire wireless PBX market to the one dominant provider of 900 MHz and 2.4 GHz products that compete with UPCS PBX systems. The FNPRM itself already has created market uncertainties to which the Commission should put an end by promptly stating that the 1920-1930 MHz band will not be reallocated.

Moreover, given certain lingering technical questions regarding the suitability of the 1920-1930 MHz band for 3G operations, the Commission should focus its consideration on a number of alternative bands, including several that have already been identified for possible reallocation.

Finally, the Commission should adopt the WINForum proposal and permit isochronous operations in the 1910-1920 MHz band. Regaining the 10 MHz of isochronous-allocated spectrum lost in the reallocation decision of 1994 would

enable NEC to serve high user density customers 1/ and offer more robust data capabilities, thereby increasing demand for UPCS products and improving the efficient use of spectrum in the entire 1910-1930 MHz band.

1/ High user density customers are typically those with large numbers of employees co-located in workspace that is unobstructed by walls. Due to the minimal signal attenuation in such open spaces, it becomes difficult to increase capacity by adding cells.

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To: The Commission

COMMENTS OF
NEC AMERICA, INC.

NEC America, Inc. ("NEC") hereby submits 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/ In the FNPRM, the FCC requested comment

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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*

on the costs and benefits of reallocating various frequency bands for use by new advanced wireless services, including third generation ("3G") mobile systems.

NEC, an affiliate of NEC Corporation, strongly urges the Commission not to reallocate the 1920-1930 MHz band. 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. Notably, NEC's WIRED FOR WIRELESS solution integrates wireless capabilities into a traditional PBX system using spectrum allocated for unlicensed PCS ("UPCS") devices in the 1920-1930 MHz band. If the Commission reallocates the band for 3G or other services, it will significantly undermine competition in the wireless PBX market and reduce the quality and variety of wireless communications capabilities available to users. Moreover, a reallocation would make worthless equipment previously purchased by enterprise customers for hundreds of thousands of employees.

I. BACKGROUND: NEC'S WIRELESS PBX PROVIDES AN INNOVATIVE SOLUTION FOR MOBILE EMPLOYEES AND FACES A VIGOROUS COMPETITIVE ENVIRONMENT

Since 1996, NEC's wireless PBX product line has offered enterprise customers an integrated solution for their on-site communications needs. In addition to functioning as a traditional, wired PBX, NEC's WIRED FOR

Third Generation Wireless Services, ET Docket No. 00-258, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, FCC 01-224 (rel. Aug. 20, 2001) ("FNPRM").

WIRELESS solution allows individual employees equipped with a NEC mobile handset to stay in constant touch with customers and colleagues. By deploying picocells served by individual or groups of transceivers, NEC's solution provides continuous coverage throughout a multi-storied building or across a multi-building campus, permitting users to walk freely around the workplace while on a call without encountering "dead zones." A highly-scalable product, the system can be used by very small enterprises, or can support as many as 16,000 mobile users with over 3,000 zone transceivers providing a coverage area of 17 million square feet. Moreover, the WIRED FOR WIRELESS solution currently offers analog modem capability for data. By the end of this year, NEC plans to introduce IP-capable base stations that will permit greater data transfer rates on a converged network.

In addition to general office applications, the NEC system is especially popular in healthcare, retail, hospitality and warehouse environments, where employees are highly mobile throughout the facility, and enjoy little or no stationary "desk time." Since 1996, NEC has developed an embedded product base of approximately 700 wireless PBX systems across the country, supporting a total of over 19,000 mobile handset users. NEC is hardly alone, however, in using the 1920-1930 MHz band to provide wireless PBX options. In the last five years, at least 10 other manufacturers have competed against NEC in providing enterprise wireless communications devices that rely on the availability of the 1920-1930 MHz

band for UPSC operations. As of year-end 2000, there were nearly 220,000 users of mobile handsets provided by NEC and other manufacturers. 2/

II. THE 1920-1930 MHZ BAND SHOULD NOT BE REALLOCATED FOR 3G

The Commission's authority to allocate and reallocate electromagnetic spectrum is governed by Section 303(y) of the Communications Act 3/ and the policies and the rules of the FCC. Under this statutory and regulatory regime, the Commission must consider several factors when determining whether the public interest would be served by selecting frequency bands for reallocation. First, the FCC must evaluate the technical suitability of a given band for a proposed service, including whether reallocation will "result in harmful interference among users." 4/ Second, the Commission must consider the incumbent users on the band, including their stage of market development, any public safety benefits currently being provided, and any disruption to customers that would be caused by a relocation. 5/

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2 Infotech, *The Wireless Business Connection* (First Quarter 2001 Report) 107 ("*Infotech Report*").

3 47 U.S.C. § 303(y) states that the Commission shall: "Have authority to allocate electromagnetic spectrum so as to provide flexibility of use, if-- (1) such use is consistent with international agreements to which the United States is a party; and (2) the Commission finds, after notice and an opportunity for public comment, that-- (A) such an allocation would be in the public interest; (B) such use would not deter investment in communications services and systems, or technology development; and (C) such use would not result in harmful interference among users."

4 47 U.S.C. § 303(y).

5 *See 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) ("*Emerging Technologies First Report & Order*") ; *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New*

Third, the Commission must consider the impact of the contemplated reallocation on existing investment and the likelihood of continued investments. 6/ Fourth, the Commission must consider the impact on competition in the marketplace. 7/ As discussed below, application of the elements of this public interest 8/ standard establishes that the Commission must not reallocate the 1920-1930 MHz band.

A. Interference from 3G Devices Would Make Band Sharing With 3G Impossible

Section 303(y)(2)(C) of the Communications Act, as amended by the Balanced Budget Act of 1997, authorizes the Commission to allocate spectrum to provide for flexibility of use only upon a finding that "such use would not result in harmful interference among users." 9/ The Commission was aware when it established the UPCS bands that "unlicensed operation will need relatively clear

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Millennium, Policy Statement, 14 FCC Rcd 19868, 19871 (¶ 11) (1999) ("*Policy Statement*").

6 *See Redesignation of the 17.7-19.7 GHz Frequency Band*, Report and Order, 15 FCC Rcd 13430, 13460-13461 (¶ 63) (2000); 47 U.S.C. § 303(y)(2)(B).

7 *See Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, Second Report and Order, 8 FCC Rcd 6495, 6506-6507 (¶ 28) (1993) ("*Emerging Technologies Second Report & Order*").

8 47 U.S.C. § 303(y)(2)(A) provides that the Commission may only allocate spectrum to provide for flexibility of use upon a finding that "such an allocation would be in the public interest." *See also Policy Statement*, 14 FCC Rcd at 19870 (¶ 8) (1999) (citing public interest considerations in reallocation decisions).

9 47 U.S.C. § 303(y)(2)(C). *See also Service Rules for the 746-764 and 776-794 MHz Bands*, First Report and Order, 15 FCC Rcd 476, 487 (¶ 24) (2000)("We interpret the Section 303(y) review requirement applicable to flexible use determinations by the Commission that would enable the sharing of specific spectrum bands by services treated as distinct by the international and domestic allocations process.").

spectrum . . . ." 10/ No intervening technological development has occurred to alter the accuracy of that assessment.

Due to their inherently mobile nature, handheld 3G devices cannot be coordinated with incumbent UPCS users. Moreover, the "listen-before-talk" service rule, which applies to isochronous UPCS, 11/ requires that UPCS devices refrain from transmissions when another signal is detected on the same frequency. The operation of a single 3G device, which will emit at higher power levels than wireless PBX handsets, could easily disrupt all wireless PBX communications within one or more picocells. Multiple 3G devices could shut down an enterprise's entire wireless communications system. Consequently, an allocation to permit use of 3G mobile devices in the 1920-1930 MHz band would create unacceptable levels of harmful interference to UPCS devices, including NEC's wireless PBX. By statute, therefore, the Commission is precluded from designating the 1920-1930 MHz band for shared UPCS/3G usage. Thus, any allocation of the band for 3G use would require an expensive relocation of UPCS to another band, just as UTAM has spent over $60 million clearing over 95 percent of the fixed microwave users out of the band.

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10 *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Second Report and Order, 8 FCC Rcd 7700, 7734 (¶ 79) (1993).

11 47 C.F.R. § 15.323(c).

B. Relocation Would Disrupt UPCS Users, Including Public Safety

When considering possible reallocations and associated relocations, the Commission must choose alternatives that will minimize the disruption of service to existing users. 12/ This requirement was emphasized throughout the Commission's *Emerging Technologies* docket, including in the NPRM which, like the current FNPRM, sought to identify spectrum for new wireless services:

> The task, then, is to identify a relatively wide band of frequencies that can be made available with a minimum of impact on existing users . . . . The factors that must be considered include:
>
> . . .
>
> Feasibility of relocation- The existing licensees must be able to relocate with a minimum of cost and disruption of service to customers. 13/

As it recently did in the MMDS/ITFS order, the Commission also considers the benefits of the service being provided by the incumbent users, and the potential effect of a relocation on the viability of incumbents. 14/ The Commission is

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12 *See, e.g., Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by Mobile-Satellite Service*, Memorandum Opinion and Order and Third Notice of Proposed Rule Making and Order, 13 FCC Rcd 23949, 23961 (¶ 28) (1998) ("we must minimize disruption and down time"); *Redesignation of the 17.7-19.7 GHz Frequency Band*, Report and Order, 15 FCC Rcd 13430, 13460-13461 (¶ 63) (2000) ("recognizing the importance of providing continuity of service to the public").

13 *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, Notice of Proposed Rulemaking, 7 FCC Rcd 1542, 1543 (¶10) (1992) ("*Emerging Technologies NPRM*") (also noting that chosen plan should be "least disruptive to the public" and create "minimum disruption of service to existing users); *see also Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, Third Report and Order and Memorandum Opinion and Order, 8 FCC Rcd 6589 (¶ 13)(1993) ("*Emerging Technologies Third Report & Order*) ("We consider it essential that the process not disrupt the communications services provided by the existing 2 GHz fixed microwave operations.").

14 *See 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*, ET Docket No.

especially sensitive to reallocation decisions that impact public safety users, as stated in its 1999 spectrum reallocation *Policy Statement*. 15/ The FCC has determined that the public safety is implicated by communications systems used by hospitals, 16/ and has recognized the importance of avoiding disruptive relocations to such systems. 17/

The precedent described above is relevant in evaluating a possible reallocation of the 1920-1930 MHz band because some forty percent of the users of NEC's wireless PBX work in hospitals or other healthcare facilities. NEC's PBX solution – which provides interference-free, wireline sound quality – is ideally suited for healthcare settings, where clarity of communications can be critical. The NEC mobile handsets have replaced traditional pagers for many emergency room

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00-258, First Report and Order and Memorandum Opinion and Order, FCC 00-455 (rel. Sept. 24, 2001) at ¶¶ 2, 28-29 (no relocation of MMDS/ITFS "in order to preserve the viability of the incumbent services;" relocating "would jeopardize the provision of important fixed wireless services;" current services "have significant value.")

15 *Policy Statement*, 14 FCC Rcd at 19871 (¶ 11) (1999); *see also Emerging Technologies Third Report and Order*, 8 FCC Rcd at ¶ 21 (1993) ("[T]hroughout this proceeding we have recognized the important essential functions, such as public safety and utility management communications, that 2 GHz fixed microwave operations now provide and indicated our intention to minimize the impact of our spectrum redevelopment plan on those services.").

16 *See Amendment of Part 90 of the Commission's Rules to Create the Emergency Medical Radio Service*, Report and Order, 8 FCC Rcd 1454, 1459 (1993); *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, Report and Order, 15 FCC Rcd 11206, 11209 (¶ 11) (2000) (allocating exclusive spectrum for medical telemetry and justifying exception to flexible allocation policy in order "to protect the public safety").

17 *See Miami Valley Hospital*, et al., Order, 14 FCC Rcd 7043 (¶ 15) (WTB 1999)(finding that waiving the relocation of hospital paging systems "serves the public interest because the hospitals' migration to other paging frequencies would pose unnecessary risks to essential medical paging communications . . . .").

doctors, operating room prep teams, 18/ and nurses. NEC's integrated nurse call system, for example, permits patients to have direct voice contact with their designated nurse – regardless of the nurse's location on the floor. Additionally, the system offers a short text-messaging service, providing a powerful way to exchange critical patient information between healthcare professionals. Further, it can be combined with medical telemetry, allowing the nurse to read a patient's vital statistics remotely. The system also provides a health benefit to the nurses themselves: the use of mobile handsets can save a nurse several miles a year in needless walking, thus decreasing wear and tear on the knees, a major source of physical impairment for nurses.

Reallocation would require NEC to replace completely all equipment, including user handsets, thereby ensuring a substantial service interruption to critical care facilities and thousands of healthcare workers. Accordingly, in order to "avoid [hospitals'] need to obtain new equipment and implement a process for switching to a new frequency," 19/ the Commission should not reallocate the 1920-1930 MHz band.

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18 One large hospital calculated that the NEC mobile communications capabilities shaved an average of six minutes off operating room preparation time, allowing it to perform an additional 600 procedures per year.

19 *Miami Valley Hospital*, et al., 14 FCC Rcd at 7045-7046 (¶ 6) (citing *New York Hospital – Cornell Medical Center*, Order, 13 FCC Rcd 5301, 5304 (WTB 1998) (finding that relocation of a hospital paging system "would significantly disrupt public safety communications")).

C. Isochronous UPCS Operations Have Grown at an Impressive Rate Since the FCC's Decision Allocating 1920-1930 MHz for Such Use

The FNPRM states that "only limited wireless PBX use has begun in the 1920-1930 MHz" band, noting that the Commission has approved 45 devices for operation in the band. 20/ This language could be interpreted by the casual observer to suggest that very few devices are in use. The number of devices approved through the Commission's equipment authorization process, however, provides little indication of the number of actual users. As noted earlier, NEC's systems alone account for over 19,000 individual users, and industry-wide reports indicate that some 220,000 handsets are currently in use. While not as staggering as figures associated with more mature products targeted at a broader market, this "limited use" is extremely impressive for such a nascent industry. In 2000, the number of users grew 31 percent. 21/ This compares favorably to the 27 percent growth in CMRS during the same period. 22/ Indeed, through the first quarter of this year, the growth in UPCS wireless PBX systems has tracked almost perfectly the growth rate originally forecasted by UTAM, Inc., the frequency coordinator for the UPCS bands, in 1995. 23/ This forecast was submitted into the record for the

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20 FNPRM at ¶ 10.

21 *Infotech Report* at 123.

22 *See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993* (6th Annual CMRS Report), FCC 01-192 (July 17, 2001).

23 *See* UTAM, Inc., "UTAM Plan for Financing and Managing 2 GHz Microwave Relocation," filed in

rulemaking proceeding that established UPCS. Moreover, last month was NEC's best ever for wireless PBX sales.

D. UPCS Has Grown at an Impressive Rate Despite Several Missteps by the Commission

Although the Commission made its initial PCS allocations in 1993, the development of the UPCS industry was initially stymied by regulatory uncertainty created by a change in the allocation of UPCS spectrum. The Commission first allocated 40 MHz for UPCS: 1900-1920 MHz for asynchronous operation and 1890-1900 MHz and 1920-1930 MHz for isochronous operation. 24/ In 1994, however, the Commission cut this allocation in half, leaving 1910-1920 MHz for asynchronous and 1920-1930 MHz for isochronous, while pledging to locate additional spectrum for UPCS in a later rulemaking. 25/ In 1995, the Commission allocated 2390-2400 MHz for asynchronous use. 26/ Consequently, prospective manufacturers of UPCS devices understandably were hesitant to begin product development until the band allocations were settled, barely six years ago.

GEN Docket No. 90-314 (Aug. 1, 1994) at Attachment H. In its most recent report to the Commission, UTAM notes that "the sizes of the systems being deployed has grown from an average of 21 users per system to 40. Many of the larger systems are supporting hundreds of users and the availability of spectrum is becoming an issue. . . . As the technology continues to become less expensive, it is expected to create wider demand for these systems both in volume and the size of systems deployed . . . . " "UTAM Report to the FCC," GEN Docket 90-314 (July 1, 2001) at 3.

24 *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Second Report and Order, 8 FCC Rcd 7700, 7738 (¶ 88) (1993).

25 *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Memorandum Opinion and Order, 9 FCC Rcd 4957, 5036 (¶ 207) (1994).

26 *See Allocation of Spectrum below 5 GHz Transferred from Federal Government Use*, First Report

Product installations were also limited by the need to clear the band of fixed microwave users. Prior to 1998, no equitable, economically feasible cost sharing formula was in place that would allow members of UTAM to take advantage of the fact that many incumbent microwave users had already been relocated. The cost sharing rules adopted by the Commission in 1996 27/ proved to be unworkable, as they permitted PCS licensees to demand reimbursements that far exceeded the original expenses they had incurred to relocate incumbent microwave users. As a result of this non-functioning cost sharing system, UPCS manufacturers had to complete a frequency coordination process for each UPCS system installation (even if the relevant incumbent user was, in fact, no longer in the band), adding considerable time and costs to the installation process. This placed UPCS devices at an obvious competitive disadvantage with respect to 900 MHz and other systems, preventing NEC and other manufacturers from aggressively marketing their systems. In 1998, UTAM and PCIA, the clearinghouse for the licensed mobile industry, agreed upon a workable cost sharing regime. It was not until 1999 that the positive effects of this agreement were felt and the coordination burden lifted in most cities. Thus, UPCS devices have achieved an impressive growth rate considering that they have had a level playing field only in the past three years.

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and Order and Second Notice of Proposed Rulemaking, 10 FCC Rcd 4769, 4779-80 (1995).

27 *See Amendment To The Commission's Rules Regarding a Plan for Sharing the Costs of Microwave Relocation*, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 8825 (1996).

Finally, the fact that only 10 MHz is available for isochronous use continues to limit the ability of manufacturers like NEC to provide high bandwidth wireless data solutions and to serve large concentrations of voice users. Additional spectrum for isochronous use undoubtedly would spur faster growth for wireless PBXs by making the product more flexible and more attractive to enterprise users. For this reason, as discussed more fully below, NEC strongly supports WINForum's proposal to allow isochronous use of the 1910-1920 band. 28/

In the past, the Commission has found that nascent, developing industries should not be targeted for reallocation. In the MDS context, for example, a FCC spectrum study concluded that because "MDS service is a developing industry, the study further finds that it would not be desirable to relocate the MDS channels at 2 GHz." 29/ The Commission later agreed, determining that MDS "should be afforded sufficient time to develop." 30/ Most of the FCC's reallocation decisions have involved more mature services, such as the fixed microwave services that had been operating in the 1920-1930 MHz band for over 20 years before the recent relocation of 95 percent of them by UTAM. Accordingly, the Commission should not force UPCS operations to relocate while they are still in their early developmental stages.

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28 *See* FNPRM at ¶ 13.

29 *Emerging Technologies NPRM*, 7 FCC Rcd at 1543-1544 (¶ 11) (1992).

30 *Emerging Technologies First Report & Order*, 7 FCC Rcd at 6889 (¶17) (1993). The Commission was persuaded in part by the number of pending applications for MDS. Because wireless PBXs are unlicensed devices, this factor cannot be applied in the UPCS context.

Such a market upheaval is not conducive to encouraging investments in new technology by customers and manufacturers.

E. Reallocation Would Be "Unduly Burdensome" and Would Deter Future Investment in UPCS

1. Commission Precedent Requires Consideration of Economic Impact on Incumbent Users

It is established Commission policy that spectrum relocation decisions should "minimize the economic impact on incumbent" users 31/ and should "reasonably protect investments in existing . . . operations." 32/ For NEC's wireless PBX system, a forced relocation would, at a minimum, result in a complete loss of all investment in existing hardware, as the handsets and zone transceivers cannot be "retuned" to operate on distant frequencies. If the Commission decided to reallocate 1920-1930 MHz, and therefore force UPCS to relocate, NEC's customers would be left with worthless equipment, thereby stranding their substantial investment in their wireless systems which, in many cases, were purchased only during the last couple of years. 33/ By comparison, the fixed microwave operators

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31 *Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by Mobile-Satellite Service*, Memorandum Opinion and Order and Third Notice of Proposed Rule Making and Order, 13 FCC Rcd 23949, 23960 (¶ 24) (1998) (citing *Emerging Technologies*, Memorandum Opinion and Order, 9 FCC Rcd 1943 at ¶ 55, 63).

32 *Redesignation of the 17.7-19.7 GHz Frequency Band*, Report and Order, 15 FCC Rcd 13430, 13460-13461 (¶ 63) (2000). *See also Emerging Technologies NPRM*, 7 FCC Rcd at 1543 (¶ 10) (1992) (establishing that, in identifying spectrum for potential reallocation, "the existing licensees must be able to relocate with a minimum of cost").

33 Replacement costs for new equipment could be expected to range from $800 to $1,500 per handset.

which the UPCS industry, via UTAM, has largely removed from the 1920-1930 MHz band, had over 20 years to become established and depreciate their equipment.

A reallocation decision that created stranded equipment as described above would not be consistent with Commission precedent contained in the *Emerging Technologies* docket. As part of the fixed microwave relocation plan, the Commission established higher data rate efficiency standards for new microwave equipment. Concerned about the ability of manufacturers to recoup their investments in equipment manufactured to comply with the old FCC rules, the Commission crafted a transition plan to minimize the burden on manufacturers. Moreover, after later recognizing that its transition plan still had the potential to "unduly burden" certain manufacturers, the Commission further relaxed its rules to allow for proper recoupment of investments. 34/

The current manufacturers of UPCS devices took the Commission at its word when it stated that "it is important, even vital, to provide for unlicensed PCS devices," 35/ and when it recognized "the important opportunities that unlicensed PCS offers for creation of new services and technologies." 36/ Relying on these and

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34 *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, Memorandum Opinion and Order, 9 FCC Rcd 1943 (¶¶ 11-15) (1994).

35 *Emerging Technologies Third Report & Order*, 8 FCC Rcd at 6599 (¶ 27) (1993).

36 *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Second Report and Order, 8 FCC Rcd 7700, 7738 (¶ 87) (1993).

other unambiguous statements of commitment to the development of a UPCS market, NEC and others invested significant amounts of capital into the research, development and marketing of UPCS devices. Likewise, thousands of enterprises made good faith investments in UPCS products, attracted by the promise of reliable communications due to the special spectrum allocation and rules for UPCS devices. A reallocation at this stage would eviscerate the reasonable, investment-backed expectations of manufacturers *and* of each end-user enterprise that would be saddled with the tremendous expense and disruption of replacing its wireless systems.

2. *Reallocation Could Prompt Manufacturers to Exit UPCS Markets*

Section 303(y)(2)(B) of the Communications Act authorizes the Commission to make certain spectrum allocations only upon a finding that the allocation "would not deter investment in communications services and systems, or technological development." 37/ Such a finding could not be made in this case. Even if the Commission required – consistent with its policy established in the *Emerging Technologies* docket – that the UPCS relocation costs be covered by the new users of the band, NEC and other companies operating in the 1920-1930 MHz band would still face significant challenges. If presented with the kind of regulatory (e.g., *new* band clearing), technical (e.g., R&D and testing on the new frequency) and

marketing uncertainties associated with a relocation, some vendors would likely be forced to seriously consider exiting the wireless PBX market. A market exit by any of the current manufacturers would result in a significant loss of investment in a growing and promising communications technology, contrary to Congressional and Commission policy, and would place the Commission in the untenable position of picking winners and losers with respect to both technologies and competitors.

F. Reallocation Would Harm Competition

The promotion of competition is a long-standing goal of the Commission that has been applied in the spectrum reallocation context. 38/ Moreover, the Presidential Memorandum issued on the subject of 3G allocations "strongly encourag[ed] independent agencies to be guided" by the principle, *inter alia*, of promoting competition in spectrum allocation decisions. 39/

By reallocating the 1920-1930 MHz band for 3G use, the Commission effectively would be picking winners and losers in the field of wireless communications for enterprises. The uncertainties created by a relocation would likely cause some customers to look for a more stable and tested solution and may cause some manufacturers to abandon the market altogether. By turning away

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37 47 U.S.C. § 303(y)(2)(B).

38 *Emerging Technologies Second Report & Order*, 8 FCC Rcd at 6506-07 (¶ 28) (1993) (adopting a band channel plan because "the plan will promote competition and not provide a short-term advantage to any manufacturer").

39 *Memorandum for the Heads of Executive Departments and Agencies On Advanced Mobile*

from UPCS systems – either because fewer products are available or due to a desire to avoid any future relocations – enterprise consumers would be deprived of the superior transmission quality and less interference potential that distinguishes UPCS systems from their 900 MHz and 2.4 GHz rivals. Moreover, a reallocation would create a competitive windfall for SpectraLink, the dominant 900 MHz/2.4 GHz manufacturer. SpectraLink is already eagerly anticipating such a scenario. In a recently issued "Field Advisory Bulletin," SpectraLink has informed its employees and others of the FNPRM's consideration of the 1920-1930 MHz band for reallocation:

> You should be aware of our competitive advantage because of the uncertainty of the continued use of the 1920-1930 MHz band for use by UPCS in-building wireless systems. Many of our competitors who use this band are already limiting their development efforts to support their wireless products. Even though the FCC may not make a final ruling for several years, this uncertainty may shut down any ongoing development of product enhancements, and may cause distributors to stop carrying UPCS product lines. 40/

As indicated by this document, the FNPRM's mere consideration of relocating the UPCS band has already caused serious injury to competition and to the health of the UPCS industry. If the FCC does not act definitively soon to end the speculation and uncertainty, the effect could worsen. Existing and potential enterprise customers could decide not to invest in new systems or additional handsets that

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Communications/Third Generation Wireless Systems (Oct. 13, 2000) at 2-3.

40 *FCC Considers Reallocation of 1910-1930 MHz Band*, SpectraLink Field Advisory Bulletin 01-16 (Aug. 31, 2001).

could soon become obsolete. The band clearing process, which is funded based on handset sales, could be slowed. Likewise, additional investment by manufacturers in new product development could be viewed as imprudent during the pendency of the reallocation issue. Thus, in order to ensure continued competition in the enterprise wireless communications market, the Commission should waste no time in notifying the industry and the market that a reallocation of the 1920-1930 MHz band is not in the public interest and will not be considered further. Such an interim order would be consistent with the Commission's recent action to quiet concerns that the MMDS and ITFS services might be relocated. 41/

G. Technical & Efficiency Considerations Make Reallocation Illogical

The Commission should also evaluate the technical constraints on reallocating the 1910-1930 MHz band for 3G services. With only 20 MHz of spectrum, no internal band pairing arrangement is possible, thus precluding the use of Frequency Division Duplex ("FDD") systems. For example, even if the extreme upper and lower 5 MHz of the band were designated for pairing (i.e., 1910-1915 and 1925-1930), that would leave only 10 MHz between the upstream and downstream frequencies, an insufficient separation in this frequency range. 42/

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41 *See 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,* ET Docket No. 00-258, First Report and Order and Memorandum Opinion and Order, FCC 00-455 (rel. Sept. 24, 2001).

42 The same analysis would apply if these upper and lower 5 MHz blocks were "merged" into the

Moreover, of the several pairing arrangements on which the FNPRM requested comments, none involved the 1910-1930 MHz band, suggesting that the Commission itself cannot envision a scenario under which the band could be paired. If pairing is not an option, the band could only be used for 3G services using a Time Division Duplex ("TDD") modulation standard. This reduces the flexibility of the band and makes it inherently less valuable in the marketplace. Currently, all the major U.S. wireless carriers employ FDD. It is unlikely these carriers would be willing to convert their networks to TDD simply in order to make use of this 20 MHz of spectrum. Without these heavily-capitalized carriers bidding for the spectrum, the auction prices would likely fall well below that for similar amounts of spectrum located in other bands. Moreover, the lack of a ready market for TDD would have a significant, negative impact on the development of equipment for the band.

Possible interference to the adjacent licensed PCS bands is also an issue of concern. Based on one study under consideration by the Inter-American Telecommunications Commission ("CITEL"), experts from established wireless industry companies, including Lucent, Motorola, Nortel and Qualcomm, expressed "major concerns over the potential for interference from TDD FWA systems operating in the 1910-1930 MHz band to both the UPCS systems and to licensed

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existing licensed PCS bands on either side of the 1910-1930 MHz band.

PCS systems in adjacent bands." 43/ Other experts, on the other hand, have concluded that PCS/PCS (i.e., FDD) adjacent operations may present just as much or even more interference than TDD/FDD adjacent operations. 44/ The lingering technical uncertainties make the 1910-1930 MHz band unsuitable for 3G services, given that both TDD and FDD operations may experience or cause harmful interference.

H. The Commission Must Consider Alternatives to Reallocating the 1920-1930 MHz Band

Finally, before causing the disruptions to service and injury to competition that would occur by reallocating the 1920-1930 MHz band, the Commission should reassess whether the WRC-2000's call for an additional 160 MHz of spectrum for 3G services is actually justified. The rollout of 3G services has been delayed in several markets around the world. 45/ As the Commission recognized in its 6th Annual CMRS Report, "many analysts and industry players believe that the widespread deployment of 3G networks and other advanced wireless technologies is still several years away, given certain technological and economic obstacles yet to be

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43 "Guide on the Results of the CITEL Study to Quantify Issues of Incompatibility Between FWA and PCS in the 1850-1990 MHz Band," CITEL, OEA/Ser.L/XVII6.1, Feb. 22, 2000 at p.177.

44 *Id.* at p.178.

45 Rollouts of 3G services were originally scheduled for spring 2001 by British Telecom on the Isle of Man and by NTT in Japan. Both carriers postponed service implementation citing technical issues. *See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993* (6th Annual CMRS Report), FCC 01-192 (July 17, 2001) at n.361.

overcome." 46/ A recent article in *Broadband Week* cited one survey's findings that only nine percent of corporate users stated they would be willing to pay the expected 50 percent premium for 3G services, and only 54 percent were willing to pay even 10 to 20 percent more. 47/ Martin Cooper, a venerable expert in the field of wireless communications, believes, in fact, that "3G will be a useful voice solution, but it does little for data. . . . All the wild hype about 3G will end up yielding to reality." 48/ Thus, in light of the changing industry view regarding the demand for and rollout of 3G services, the Commission may find that an allocation of less than 160 MHz would be appropriate.

Moreover, there are bands other than 1920-1930 MHz that may be more appropriate for reallocation. Based on the unsteady economic state of the mobile satellite industry, the 2 GHz band allocated for Mobile-Satellite Services ("MSS") may not be as heavily used as previously projected. Two MSS licensees, Iridium and ICO, have recently emerged from Chapter 11 bankruptcies, but with uncertain futures. Globalstar recently failed to repay a $250 million loan, requiring guarantor Lockheed Martin to make the payment. 49/ The stock price for MSS

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46 *Id.*

47 Karen J. Bannan, *Twisted Road to 3G Spectrum Goes Through Washington,* BROADBAND WEEK (Aug. 6, 2001).

48 Neil Gross, *Martin Cooper: A Wireless Prophet Who's Pushing "Smart Antennas,"* BUSINESS WEEK ONLINE (May 17, 2001), *available at* <<http://www.businessweek.com/technology/content/0005/em0517.htm.>>

49 *See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993* (6th

licensee Motient Corporation has dropped to below $0.25 per share. Based on these changed circumstances, the Commission would be better justified in reallocating a portion of the 2 GHz MSS spectrum.

The 746-806, 1710-1750, 2110-2150 and 2160-2165 MHz bands would also provide a more suitable choice, as they are already available and designated for commercial use. 50/ Finally, as the Commission has noted, an NTIA study has concluded that under certain conditions, portions of the 1755-1850 MHz band could be allocated for 3G usage. 51/ At a minimum, no decision should be made regarding the 1920-1930 MHz band until the Commission concludes that spectrum that is currently available for 3G is insufficient and a study similar to that conducted regarding 1755-1850 and 2500-2690 MHz has been conducted to determine suitability.

III. THE COMMISSION SHOULD PERMIT ISOCHRONOUS OPERATIONS IN THE 1910-1920 BAND

After cutting the amount of spectrum available for UPCS operations from 40 MHz to 20 MHz in 1994, the Commission has since "replaced" only 10 MHz designated for asynchronous operations. In retrospect, given the dearth of

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Annual CMRS Report), FCC 01-192 (July 17, 2001) at 49.

50 The Balanced Budget Act of 1997 requires assignment of the 1710-1750 and 2110-2150 MHz bands by competitive bidding.

51 *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, Notice of Proposed Rulemaking, FCC 00-455

asynchronous devices in the 1910-1920 MHz band, isochronous devices may have been a more deserving beneficiary of the spectrum restitution. The Commission should correct this imbalance and provide for a more efficient use of the spectrum by permitting the operation of isochronous devices in the 1910-1920 MHz band in accordance with the proposal contained in the WINForum Petition.

An additional 10 MHz of spectrum would enable NEC and other manufacturers of UPCS systems to serve more customers and offer more robust data capabilities. Currently, NEC faces limitations in providing service to certain enterprise facilities with high user densities in large open spaces. Like licensed PCS networks, the capacity of NEC's wireless PBX system is limited by the extent to which it can re-use spectrum by breaking the coverage area down into multiple cells. Due to the minimal signal attenuation in spaces such as large open-floorplan structures, it becomes difficult to increase capacity by adding cells. Recently, for example, NEC could not fulfill a potential sale because the prospective customer needed coverage for a high density of employees located in one large unobstructed work environment. With an extra 10 MHz of spectrum, NEC would have had the additional capacity needed to meet the requirements of that enterprise.

In addition to expanding capacity for voice applications, having access to the 1910-1920 MHz band would permit NEC to offer its enterprise customers significantly higher data rates. The ability to offer data and voice on a converged

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(rel. Jan. 5, 2001) at ¶ 47.

wireless platform would make wireless PBXs more attractive to many potential customers, thereby increasing the deployment of UPCS devices and making a more efficient use of the spectrum in the entire 1910-1930 MHz band.

Providing for a flexible use of the 1910-1920 MHz band, where it is possible without causing harmful interference, would be consistent with Congressional and Commission policy to promote the flexible use of spectrum. In its 1999 *Policy Statement*, the Commission recognized the efficiencies that can result from flexible allocations. 52 Moreover, Congress provided the Commission with explicit authority to make flexible allocations in section 303(y) of the Communications Act. 53 A flexible allocation here would satisfy all the statutory requirements of section 303(y)(2), as it: (a) would be in the public interest because it would promote more efficient spectrum usage; (b) would not deter investment in communications services and systems, but in fact, would increase such investment; and (c) would not result in harmful interference among users because the band is currently empty and the etiquette for isochronous operations already minimizes interference potential. Accordingly, the Commission should grant the WINForum Petition to prevent this valuable spectrum from lying fallow.

52/ *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium*, Policy Statement, 14 FCC Rcd 19868 (1999).

53/ *See* 47 U.S.C. § 303(y).

IV. CONCLUSION

For the foregoing reasons, NEC believes that the Commission should not reallocate the 1920-1930 MHz band for 3G usage. Doing so would not be in the public interest, would seriously injure competition in the wireless PBX market and would sharply reduce both the quality and quantity of communications options in the enterprise market. Moreover, the Commission should permit isochronous operations in the 1910-1920 MHz band, which would encourage more rapid growth in both that band and in the 1920-1930 MHz band.

Respectfully submitted,

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