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
	)	
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
	)	
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

SIXTH REPORT AND ORDER, THIRD MEMORANDUM OPINION AND ORDER, AND FIFTH MEMORANDUM OPINION AND ORDER

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By the Commission: Chairman Powell, Commissioners Copps and Adelstein issuing separate statements.

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I. INTRODUCTION

1. In this *Sixth Report and Order and Third Memorandum Opinion and Order* (*Sixth R&O and Third MO&O*) in ET Docket No. 00-258, we continue our ongoing efforts to promote spectrum utilization and efficiency by evaluating spectrum that may be suitable for the provision of new services, including Advanced Wireless Services (AWS).[1] In the *Sixth R&O*, we find that the bands 1915-1920 MHz paired with 1995-2000 MHz and 2020-2025 MHz paired with 2175-2180 MHz – which were all previously reallocated for Fixed and Mobile services – are well suited to provide additional spectrum for AWS use and we designate these paired bands for such use. This action will provide an additional twenty megahertz of spectrum for the introduction of new services and technology. We also note that in a companion item, *AWS 2 GHz Service Rules NPRM*, the Commission seeks comment on applicable service rules that should be adopted for the 1915-1920/1995-2000 MHz and 2020-2025/2175-2180 MHz blocks that are paired herein.[2] We also modify our rules pertaining to unlicensed PCS services in the 1920-1930 MHz band in order to provide additional flexibility to users of the band to offer both voice and data services using a variety of technologies.

2. In the *Third MO&O* in ET Docket No. 00-258, we deny and dismiss petitions for reconsideration that oppose the reallocation of ninety megahertz of spectrum from Federal Government and non-Federal Government operations in the 1710-1755 MHz and 2110-2155 MHz bands to support AWS in the *AWS Second Report and Order*,[3] and we deny petitions for reconsideration that oppose the reallocation of thirty megahertz of spectrum from the Mobile-Satellite Service (MSS) in the 1990-2000 MHz, 2020-2025 MHz, and 2165-2180 MHz bands in the *AWS Third Report and Order*.[4] In the *Fifth Memorandum Opinion and Order* (*Fifth MO&O*) in ET Docket No. 95-18, we grant in part and deny in part a petition for reconsideration pertaining to the relocation procedures we adopted for Fixed Service

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[1]Advanced Wireless Services is the collective term we use for new and innovative fixed and mobile terrestrial wireless applications using bandwidth that is sufficient for the provision of a variety of applications, including those using voice and data (such as internet browsing, message services, and full-motion video) content. In an ongoing service rules proceeding for ninety megahertz of spectrum for AWS, we have adopted rules that provide licensees of this spectrum with the flexibility to quickly adapt to changes in technological capabilities and marketplace conditions into the future, and have stated that our goal for the AWS-designated spectrum is "to put this spectrum to its highest value use with minimal transaction cost." Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, WT Docket No. 02-353, *Report and Order*, 18 FCC Rcd 25162 (2003) ("*AWS 1.7 and 2.1 GHz Service Rules Order*"). Although AWS is commonly associated with so-called third generation (3G) applications and has been predicted to build on the successes of such current-generation commercial wireless services as cellular and Broadband PCS, the services ultimately provided by AWS licensees are only limited by the Fixed and Mobile designation of the spectrum we allocate for AWS and the service rules we ultimately adopt for the bands.

[2]Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands, WT Docket No. 04-356 (*"AWS 2 GHz Service Rules NPRM"*).

[3]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, *Second Report and Order*, 17 FCC Rcd 23193 (2002) (*"AWS Second R&O"*).

[4]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, IB Docket No. 99-81, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2223 (2003) (*"AWS Third R&O, Third NPRM, and Second MO&O"*).

(FS) microwave incumbents in the *MSS Third Report and Order and Third Memorandum Opinion and Order* in that docket.[5]

II. EXECUTIVE SUMMARY

3. On February 10, 2003, the Commission released the *AWS Third R&O* in ET Docket No. 00-258 that identified and reallocated thirty megahertz of spectrum from MSS at 1990-2000/2020-2025 MHz and 2165-2180 MHz bands to Fixed and Mobile services to support AWS. In the instant decision, we evaluate a number of other frequency bands that were identified for possible AWS use, but not addressed in our previous decisions. In the *Sixth R&O* in ET Docket No. 00-258 herein, we:

- Make a five + five megahertz paired block of spectrum at 1915-1920 and 1995-2000 MHz available for AWS applications by redesignating the 1915-1920 MHz band from Unlicensed Personal Communications Services (UPCS) to AWS and addressing several pending petitions for rulemakings and petitions for waivers relating to use of the band. Pairing this band with the 1995-2000 MHz band, which was previously reallocated from the MSS, promotes the most efficient use of the spectrum to support innovative mobile applications and complements adjacent Broadband PCS allocations, thereby allowing for quicker and easier deployment of services in the band.

- Find that an additional ten megahertz of spectrum, consisting of the 2020-2025 MHz and the 2175-2180 MHz bands, which is adjacent to MSS spectrum that can be used to provide terrestrial operations, should be made available as paired AWS spectrum. Both bands were previously designated for AWS use in this proceeding.

- Adopt a reimbursement plan to compensate UTAM, Inc. (UTAM) for relocation expenses it has incurred in relocating incumbents from the 1915-1920 MHz band.

- Address how the existing relocation and reimbursement plan for incumbent BAS licensees in the 1990-2025 MHz band – which has already been reallocated in part for Fixed and Mobile services – will apply to the five megahertz spectrum block at 1995-2000 MHz and the five megahertz spectrum block at 2020-2025 MHz, and how the existing relocation and reimbursement plan will apply to the incumbent FS licensees in the five megahertz spectrum block at 2175-2180 MHz – which has also already been reallocated for Fixed and Mobile services.

- Modify our existing rules for isochronous (voice) UPCS operations in the 1920-1930 MHz band in order to provide additional flexibility. These modifications will permit the deployment of additional unlicensed devices in the band operating on a wider variety of technologies.

In the *Third MO&O* in ET Docket No. 00-258 herein, we:

- Deny a petition for reconsideration jointly filed by XM and Sirius that claims that the Commission failed to consider their comments regarding use of the 2360-2395 MHz band as replacement spectrum for users relocated from the 1710-1755 MHz and 2110-2155 MHz bands, and the effect that such use would have on adjacent satellite systems.

[5] *See* 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, *Third Report and Order and Third Memorandum Opinion and Order*, 18 FCC Rcd 23638 (2003) (*"MSS Third R&O and Third MO&O"*).

- Deny petitions for reconsideration filed by Sprint and WCA that seek comparable replacement spectrum and full compensation for relocation costs for displaced Multipoint Distribution Service (MDS) licensees in the 2150-2162 MHz band.

- Dismiss a petition for reconsideration filed by PCIA that seeks modification of Section 101.99 of the Rules to establish a clearinghouse to oversee cost-sharing procedures associated with incumbent relocation in the 2110-2150 MHz band.

- Deny petitions for reconsideration filed by Celsat, CTIA, ICO, SIA, and TMI and TerreStar that oppose the decision to reallocate portions of the 2 GHz MSS spectrum.

In the *Fifth MO&O* in ET Docket No. 95-18 herein, we:

- Grant in part, by clarifying certain rules, and otherwise deny a petition for clarification and reconsideration jointly filed by the American Petroleum Institute and the United Telecom Council concerning the negotiation and relocation procedures for incumbent FS licensees in the 2110-2150 MHz and 2180-2200 MHz bands.

III. BACKGROUND

4. The Commission identified a large number of potential bands to support the types of innovative mobile services that it has broadly described as "AWS" in the January 2001 *Notice of Proposed Rulemaking and Order*,[6] and in the August 2001 *Memorandum Opinion and Order and Further Notice of Proposed Rule Making* in this proceeding.[7] Collectively, in the *AWS Notice* and the *AWS Further Notice*, the Commission sought comment on the suitability for use by AWS of frequency bands that included the 1910-1930 MHz band (designated for UPCS), the 1990-2025 MHz band (allocated for MSS) and other bands. More specifically, the *AWS Further Notice* sought comment on whether a portion of, or the entire, 1910-1930 MHz band should be redesignated for AWS or used as relocation spectrum for incumbents in other frequency bands that are displaced by new AWS licensees.[8] Subsequent decisions have narrowed the spectrum bands under consideration. In the September 2001 *First Report and Order and Memorandum Opinion and Order*, the Commission modified the existing allocation in the 2500-2690 MHz band to provide additional flexibility, but did not reallocate the band to AWS.[9] In the November 2002 *Second Report and Order*, the Commission allocated ninety megahertz of spectrum for AWS, consisting of forty-five megahertz of Federal Government-use spectrum in the 1710-1755 MHz band and forty-five megahertz in the 2110-2155 MHz band.

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[6]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, *Notice of Proposed Rulemaking and Order*, 16 FCC Rcd 596 (2001) (*"AWS Notice"*).

[7]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, ET Docket No. 95-18, and IB Docket No. 99-81, *Memorandum Opinion and Order and Further Notice of Proposed Rule Making*, 16 FCC Rcd 16043 (2001) (*"AWS Further Notice"*).

[8]*AWS Further Notice*, 16 FCC Rcd 16043, ¶ 9.

[9]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, *First Report and Order and Memorandum Opinion and Order*, 16 FCC Rcd 17222 (2001) (*"AWS First R&O and MO&O"*).

5. In its February 2003 *AWS Third R&O, Third NPRM and Second MO&O*, the Commission considered use of spectrum in the 1910-1930 MHz band, as well as spectrum allocated to the 2 GHz MSS service in the 1990-2025 MHz and 2165-2200 MHz bands. In the *AWS Third R&O*, the Commission reallocated the 1990-2000 MHz, 2020-2025 MHz, and 2165-2180 MHz bands for Fixed and Mobile services. In the *AWS Third NPRM*, the Commission identified the portion of UPCS band at 1910-1920 MHz as spectrum that could be made available for AWS or other purposes and sought comment with regard to using it for paired or unpaired operations – including entirely new AWS applications, expansion of existing Broadband PCS operations to support new and innovative mobile services, and as relocation spectrum for existing services. In a separate proceeding, ET Docket No. 95-18, the Commission had established the procedures by which 2 GHz MSS licensees would relocate BAS and FS licensees from the 1990-2025 MHz and 2165-2200 MHz bands, respectively. In light of the reallocation of a portion of this spectrum to support new Fixed and Mobile services, the Commission issued a *MSS Third Report and Order* in ET Docket No. 95-18 revising these relocation procedures to account for the new entrants into the band.

6. Most recently, in conjunction with WT Docket 02-55, in its July 2004 *800 MHz R&O*,[10] the Commission redesignated the 1910-1915 MHz band from UPCS use to licensed Fixed and Mobile services, adopted a reimbursement plan to compensate UTAM for relocation expenses it had incurred in relocating incumbents from this band, and addressed pending petitions for rulemakings and petitions for waivers relating to new use of the 1910-1915 MHz band. Also, the Commission created a five + five pairing of the 1910-1915 MHz and 1990-1995 MHz bands for licensed Fixed and Mobile services in order to assign this spectrum to Nextel as replacement spectrum for the relocation of certain Nextel operations in the 800 MHz band. Finally, the Commission addressed how the existing relocation and reimbursement plan for incumbent BAS licensees in the 1990-1995 MHz band would apply in the event that Nextel was the first entrant into this spectrum block.

IV. SIXTH REPORT AND ORDER

7. In the *Sixth R&O* we identify two five + five megahertz spectrum blocks that are especially well suited for AWS use, and find that such a designation will maximize the potential use of the spectrum and promote the deployment of high value service offerings. Specifically, we redesignate the 1915-1920 MHz and 1995-2000 MHz, as well as the 2020-2025 MHz and 2175-2180 MHz spectrum blocks as paired bands suitable for the introduction of new technologies. The companion *AWS 2 GHz Service Rules NPRM* addresses licensing of the bands, certain relocation matters, and other technical rule issues, including interference issues concerning AWS and Broadband PCS. We address, below, matters pertaining to the redesignation, pairing, and relocation of incumbent services in each of these bands. We also modify our UPCS rules in the 1920-1930 MHz band in order to allow for the deployment of a greater range of unlicensed devices in this spectrum band.

A. 1915-1920 MHz and 1995-2000 MHz Bands

[10] Improving Public Safety Communications in the 800 MHz Band, Consolidating the 800 and 900 MHz Industrial/Land Transportation and Business Pool Channels, WT Docket 02-55, 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, 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, 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, *Report and Order, Fourth Report and Order, Fourth Memorandum Opinion and Order, and Order*, FCC No. 04-168 (released August 6, 2004) ("*800 MHz R&O*").

i. Background

8. The 1915-1920 MHz band is a subset of a larger band at 1910-1930 MHz that is allocated to Fixed and Mobile services on a primary basis,[11] and is designated for use by UPCS devices in the 1915-1930 MHz band.[12] Under the current rules, the 1915-1920 MHz portion of the band may be used for asynchronous (generally data) UPCS devices and the 1920-1930 MHz portion may be used for isochronous (generally voice) UPCS devices.[13] In the *800 MHz R&O*, we redesignated the 1910-1915 MHz band from UPCS to licensed Fixed and Mobile services and assigned the spectrum to Nextel as replacement spectrum for relocated operations in the 800 MHz band. To minimize interference to adjacent band operations, we required Nextel to conform to the same technical standards applicable to licensed PCS systems.[14] Because this decision was made relatively recently, much of the record in this proceeding addresses the larger 1910-1930 MHz band. Although we now consider the smaller 1915-1920 MHz portion of this band herein, the factors that led to our pairing of the 1910-1915/1990-1995 MHz bands in the *800 MHz R&O* are relevant to the relocation decisions we make herein.

9. The 1995-2000 MHz band is part of a larger 1990-2110 MHz band (2 GHz BAS band) that is currently used by BAS licensees. In the *MSS Second R&O*, the Commission reallocated the 1990-2025 MHz segment to the MSS and established a relocation plan for incumbent BAS.[15] More recently, we reallocated fifteen megahertz of spectrum in the 1990-2025 MHz band for new AWS entrants.[16] This fifteen megahertz block includes the 1990-1995 MHz band that we licensed to Nextel in the *800 MHz R&O*, as well as the 1995-2000 MHz and 2020-2025 MHz bands that we address herein.

10. Before the 1910-1930 MHz band was made available for UPCS applications, this band was first used by fixed point-to-point microwave links. To facilitate the introduction of UPCS systems, the

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[11] *See* 47 C.F.R. § 2.106.

[12] *See* 47 C.F.R. Part 15 – Radio Frequency Devices. Subpart D of Part 15 is titled "Unlicensed Personal Communications Service Devices."

[13] Asynchronous devices are defined as those "that transmit RF energy at irregular time intervals, as typified by local area network data systems," and isochronous devices are defined as those "that transmit at a regular interval, typified by time-division voice systems." *See* 47 C.F.R. § 15.303(a)-(d). To minimize the potential of systems in each band interfering with other systems operating in the same band, the Commission adopted rules requiring UPCS devices to monitor the spectrum prior to transmitting. Specific requirements for the operation of asynchronous devices in the 1910-1920 MHz band are codified at 47 C.F.R. § 15.321 and specific requirements for the operation of isochronous devices in the 1920-1930 MHz band are codified at 47 C.F.R. § 15.323.

[14] *See generally*, 47 C.F.R. § 24.232 *et seq*. Rules were created to ensure that Nextel operates its mobile/portable stations in the 1910-1915 MHz block and that these operations conform to lower-adjacent broadband PCS operations. See 47 C.F.R. § 24.229(c).

[15] *See* 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, *Second Report and Order and Second Memorandum Opinion and* Order, 15 FCC Rcd 12315 (2000) ("*MSS Second R&O*").

[16] Specifically, the fifteen megahertz of spectrum was reallocated from MSS in the 1990-2025 MHz band to support new Fixed and Mobile services – ten megahertz occupy the lower end (1990-2000 MHz) of the band and five megahertz are situated at the upper end (2020-2025 MHz). *See AWS Third R&O, Third NPRM, and Second MO&O*, 18 FCC Rcd at 2231, ¶ 15.

Commission established policies in the *Emerging Technologies* proceeding[17] for the relocation of incumbent microwave systems from this band and designated a single entity, UTAM, to coordinate and manage the transition.[18] The record of deployment of UPCS services, to date, has been mixed. Currently, the most widespread application of the 1920-1930 MHz UPCS band is for wireless PBX systems.[19] However, a search of our equipment authorization database has found no UPCS equipment authorized for the 1910-1920 MHz band.

11. In the *AWS Third NPRM*, we revisited the issue of redesignating all or a portion of the 1910-1930 MHz band for Fixed and Mobile services with the intent of promoting AWS use. As an initial matter, the *AWS Third R&O* removed the 1920-1930 MHz band from consideration for AWS use, due to the existing isochronous UPCS voice applications that have been deployed in that band segment.[20] In the *AWS Third NPRM*, we also sought comment on reallocation options for the 1910-1920 MHz band. Specifically, we noted that asynchronous UPCS applications had not been developed since the service was authorized in 1994, and tentatively concluded the public interest would not be served if the ten megahertz of spectrum designated for asynchronous use in the 1910-1920 MHz band remained fallow when there were many applications that could put it to good use.[21]

12. In the *AWS Third NPRM* we sought comment on how much we can reduce the frequency separation between the Broadband PCS base station transmit at 1930-1990 MHz and mobile transmit at 1850-1910 MHz in order to allow new systems to be deployed while continuing to protect existing Broadband PCS operations, and what rules we would have to adopt to permit such operations. We noted that Broadband PCS has been implemented domestically using frequency division duplex (FDD) technology, which requires separation between the base and mobile transmit frequencies, and therefore technical considerations relating to band separation must be addressed before considering redesignating spectrum in the 1910-1920 MHz band. To the extent that we recognized that we might not decide to pair the entire 1910-1920 MHz band, we also sought comment as to whether we should retain the 1915-1920 MHz band for UPCS use, but allow for greater flexibility of UPCS use within the entire 1915-1930 MHz band, as well as whether any UPCS rules changes would be appropriate if we reduced the UPCS band to 1920-1930 MHz.[22] Because there was a general consensus that the frequency separation could easily be

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[17] *See* Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, ET Docket No. 92-9, *First Report and Order and Third Notice of Proposed Rule* Making, 7 FCC Rcd 6886 (1992); *Second Report and Order*, 8 FCC Rcd 6495 (1993); *Third Report and Order and Memorandum Opinion and Order*, 8 FCC Rcd 6589 (1993); *Memorandum Opinion and Order*, 9 FCC Rcd 1943 (1994); *Second Memorandum Opinion and Order*, 9 FCC Rcd 7797 (1994); *aff'd Association of Public Safety Communications Officials-International, Inc. v. FCC*, 76 F.3d 395 (D.C. Cir. 1996) (collectively, "*Emerging Technologies* proceeding").

[18] *See* Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, *Fourth Memorandum Opinion and Order*, 10 FCC Rcd 7955 (1995). UTAM is the Commission's frequency coordinator for UPCS devices in the 1910-1930 MHz band. The UPCS band relocation policies are codified at 47 C.F.R. §§ 24.239-24.53 and 101.69-101.81.

[19] *AWS Third NPRM*, 18 FCC Rcd at 2243-2244, ¶ 40.

[20] *AWS Third NPRM*, 18 FCC Rcd at 2247, ¶ 46.

[21] In 1994, the Commission anticipated that the 1910-1920 MHz band would be used for data applications such as high-speed, high-capacity LANs. *See* Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, *Second Report and Order*, 8 FCC Rcd 7700 (1993).

[22] *AWS Third NPRM*, 18 FCC Rcd at 2249-2250, ¶ 52.

reduced by five megahertz (*i.e.* to a 15 MHz separation), we only considered this issue in limited detail as part of the *800 MHz R&O.*

13. The *AWS Third NPRM* also noted that the 1910-1920 MHz band (or a portion thereof) and the 1990-2000 MHz band (or a portion thereof) were well suited to be part of a paired spectrum allocation, and we tentatively concluded that it would serve the public interest to adopt a five + five megahertz or a ten + ten megahertz pairing within these bands.[23] We noted that such a pairing would allow for a number of new uses, including an expansion of systems using the adjacent Broadband PCS bands. We also noted that such an allocation might allow for quicker design and deployment of new equipment because existing Broadband PCS systems operate on adjacent bands, and that because the 1910-1920 MHz band lacks incumbent UPCS users, new licensees need only address relocation as it pertains to the relocation of incumbent point-to-point microwave systems in the band. Finally, we also noted that a five + five megahertz block pairing could accommodate the design specifications of both existing high-power mobile applications (such as Broadband PCS) and systems (such as WCDMA and CDMA-2000) that have commonly been proposed for AWS deployment.[24]

14. In conjunction with our proposal to redesignate as much as ten megahertz in the 1910-1920 MHz band, we recognized that new licensees in the band would reap the benefits of UTAM's band clearing efforts and concluded that UTAM should be adequately reimbursed for its efforts. Therefore, we sought comment on proposals for reimbursing UTAM. In particular, we proposed that UTAM be entitled to a percentage of the total reimbursement expenses incurred for the 1910-1930 MHz band as of the effective date of any final rules adopted in this proceeding.[25] In crafting the relocation obligations for Nextel in the *800 MHz R&O* with respect to the 1910-1915 MHz band, we generally followed these proposals. The Commission also established and subsequently modified a relocation plan for BAS incumbents in the 1990-2025 MHz band (of which the 1995-2000 MHz band is a subset). We address those procedures in greater detail, *infra.*

15. Finally, we note that there are several outstanding petitions that relate to use of the 1915-1920 MHz band segment. There are five petitions for waiver filed by Lucent, UTStarcom & Drew University, Ascom, Alaska Power, and RBM;[26] and two petitions for rulemaking filed by WINForum[27]

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[23] *AWS Third NPRM,* 18 FCC Rcd at 2247, ¶ 48. The 1990-2000 MHz band was previously reallocated from BAS to MSS use but, in earlier decisions in this proceeding, was reallocated to the Fixed and Mobile services in order to support AWS applications. We discuss specific relocation matters concerning BAS licensees operating in this band *infra.*

[24] *AWS Third NPRM,* 18 FCC Rcd at 2247-2248, ¶¶ 48-49.

[25] For example, the redesignation of five megahertz of the twenty megahertz band would entitle UTAM to twenty-five percent of its total.

[26] In its petition for waiver, Lucent requests that it be allowed to use the 1910-1920 MHz band for its Definity PBX voice system within the confines of Cook County, Illinois. Also, UTStarcom & Drew University request permission to use the 1910-1920 MHz band to install the UTStarcom Personal Access System (PAS) on the campus of Drew University in Madison, New Jersey, in order to provide wireless telephone service to the students and staff, as an extension of the university's wired telephone system. In addition, Ascom requests that it be allowed to use the 1910-1920 MHz band for its Freeset DCT 1900 PBX voice system within the confines of Cook County, Illinois; New York City; and San Francisco, California, because several of its commenters, who are boards of trade or stock exchange entities, need high-capacity indoor wireless communications. Finally, Alaska Power requests a waiver of Part 15 asynchronous spectrum etiquette to operate a community wireless voice system over the 1910-1920 MHz (data) band, in order to serve small rural areas in Alaska that are currently unserved or underserved by wireless service providers. In its waiver request, RBM requests permission to operate voice (continued....)

and UTStarcom;[28] most of which request various unlicensed use of the band. We address these pleadings in conjunction with our overall evaluation of the merits of using the 1915-1920 MHz band for new AWS applications.

ii. Suitability as AWS Spectrum

16. As an initial matter, the record in the AWS proceeding, ET Docket 00-258, strongly supports more spectrum for the introduction of new services and predicts high growth and strong demand for AWS services.[29] Many commenters in this proceeding endorse the introduction of high power licensed services into all or part of the bands we identified, with the record supporting an overall need for additional spectrum for AWS. For example, the Information Technology Industry Council claims that AWS can provide a broadband alternative, promote competition, foster innovation, and reach new service areas.[30] Also, Telephone and Data Systems assert that no other prospective service for which we could make an allocation promises the economic benefits of AWS.[31] The development of new and innovative mobile service offerings would, in turn, aid in the development of competitive markets, and provide the types of economic benefits that can promote economic recovery of telecommunication markets.

17. Despite the robust support for additional AWS spectrum in general, many commenters claim that the 1915-1920 MHz band would not be a good candidate for such use.[32] This band, when paired with the 1995-2000 MHz band, is similar to the spectrum we redesignated in the *800 MHz R&O* in that its adjacency to and consistent frequency separation with existing Broadband PCS blocks would promote the rapid development of AWS services – including those that are expected to be developed based on technologies that have been used in existing Broadband PCS deployments in the adjacent bands. However, as we recognized in the *Third NPRM*, use of the 1915-1920 MHz band for high powered licensed services will reduce the separation distance between the current Broadband PCS base and mobile transmit bands. We had sought comment on the extent such a reduction would be feasible so that

(Continued from previous page)
devices in the 1915-1920 MHz band to provide low-power fixed wireless local loop telephone service in Las Vegas, Nevada.

[27]In its petition for rulemaking, WINForum asks the Commission to allow isochronous UPCS devices to use the 1910-1920 MHz band and to phase out asynchronous use in this band, thereby providing twenty megahertz of spectrum (1910-1930 MHz) for isochronous devices, and also to modify certain technical requirements for UPCS devices in Part 15.

[28]In its petition, UTStarcom requests that the 1910-1920 MHz band be made available for licensing via competitive bidding to permit the establishment of community wireless network service, using the UTStarcom PAS which is based on Japan's RCR-28 Personal Handy Phone System (PHS) standard.

[29]*AWS Third NPRM*, 18 FCC Rcd at 2247-2248, ¶¶ 47-49. Since the Commission reallocated the 1910-1915 MHz band for licensed Fixed and Mobile services in an earlier rulemaking, any comments that reference use of the entire 1910-1920 MHz band will only apply to the 1915-1920 MHz band, herein.

[30]Information Technology Industry Council Reply Comments to *AWS Notice* at 2.

[31]Telephone and Data Systems Comments to the *AWS Further Notice* at 4-5. *See also* Motorola Comments to the *AWS Further Notice* at 2 (citing a prediction that AWS will generate $38-47 billion in additional service revenues per year);

[32]*See, e.g.*, CTIA Comments to *AWS Third NPRM* at 3-5; *ex parte* Comments of CTIA filed on July 30, 2004; Motorola Comments to *AWS Third NPRM* at 4-6; *ex parte* Comments of Motorola filed on July 20, 2004; UTAM Comments to *AWS Third NPRM* at 4-5; Verizon Comments to *AWS Third NPRM* at 5.

new systems could be deployed while protecting existing Broadband PCS operations. We also requested comment on what rules would be needed to permit such operations.[33]

18. A number of parties specifically addressing these questions submitted documentation that they claim shows that high-powered licensed operations (such as those based on current Broadband PCS applications) could not be expanded into the 1915-1920 MHz band. Thus, they oppose redesignating the 1915-1920 MHz band from unlicensed PCS to licensed broadband wireless services.[34] We note and address in greater detail below more recent filings in this proceeding that refute the claim that this band cannot be used for such high-powered applications. In general, the commenters opposing redesignation of the 1915-1920 MHz band for AWS state that redesignating this spectrum would cause harmful interference to adjacent Broadband PCS services. Three reasons are generally provided: out-of-band emissions, receiver overload, and unavailability of duplexers with sufficient attenuation.[35] That is, by reducing the frequency separation between the mobile transmit and receive bands, these parties argue that a signal transmitted from a mobile at the upper end of the band (near 1920 MHz) would interfere with a mobile attempting to receive in the 1930-1990 MHz band. They argue that this would occur because the signal may not be attenuated enough by the time it reaches a mobile attempting to receive in the 1930-1990 MHz band and therefore could cause interference due to out-of-band emissions or an overload problem. Similarly, commenters argue that because the mobile is receiving at the same time it is transmitting, current duplexer technology does not allow for the necessary attenuation with only a ten megahertz separation.[36] Generally, commenters argue that current equipment is designed for a twenty megahertz separation and that filters are not available, nor would be available cheaply, to ensure enough attenuation if only ten megahertz separated the transmit and receive bands.[37]

19. Motorola and Verizon specifically oppose expanding licensed operations in the 1915-1920 MHz band because, they contend, it would result in harmful interference to existing Broadband PCS operations, particularly above 1930 MHz.[38] Motorola, as well as UTAM, assert that redesignating this band would require the duplexer in a mobile transmitter operating at 1920 MHz to achieve at least 40 dB

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[33] *AWS Third NPRM*, 18 FCC Rcd at 2248-2249, ¶ 50.

[34] *See, e.g.*, CTIA Comments to *AWS Third NPRM* at 3-5; *ex parte* Comments of CTIA filed on July 30, 2004; Motorola Comments to *AWS Third NPRM* at 4-6; *ex parte* Comments of Motorola filed on July 20, 2004; UTAM Comments to *AWS Third NPRM* at 4-5; Verizon Comments to *AWS Third NPRM* at 5.

[35] Receiver overload occurs when a nearby transmitter is transmitting a strong signal which is received in the receiver front end. For a receiver with automatic gain control (AGC), the presence of the strong signal could cause the AGC to reduce to such a level that the desired signal cannot be received. For a receiver that does not have AGC, the presence of a strong signal could saturate the low noise amplifier (LNA) preventing signals from being processed. Both instances can occur even if the desired receive frequency is not close to the frequency of the undesired signal. A duplexer is a device that enables a handset to transmit and receive simultaneously. The duplexer provides filtering that rejects a handset's outgoing transmissions, while accepting incoming transmissions. In order for duplexers to work properly, there must be sufficient spectral separation between the mobile transmit and receive bands.

[36] *See, e.g., ex parte* Comments of Sprint filed on September 1, 2004; *ex parte* Comments of CTIA filed on July 30, 2004.

[37] *See, e.g.*, CTIA Comments to *AWS Third NPRM* at 3-5; *ex parte* Comments of CTIA filed on July 30, 2004; Motorola Comments to *AWS Third NPRM* at 4-6; *ex parte* Comments of Motorola filed on July 20, 2004; UTAM Comments to *AWS Third NPRM* at 4-5; Verizon Comments to *AWS Third NPRM* at 5.

[38] Verizon Comments to *AWS Third NPRM* at 5-6. *See also* Motorola Reply Comments to *AWS Third NPRM* at 6.

of attenuation at 1930 MHz to prevent interference. They contend this would require the use of split band, or two duplexers, which would significantly increase the size and cost of handsets. Moreover, they state that it is not feasible to manufacture handsets using split band duplexers that meet industry specifications.[39] Additionally, CTIA raises a concern with in-band operations if 1915-1920 MHz were redesignated: AWS mobile transmitters could cause overload to other PCS receivers.[40] Moreover, Sprint raises a concern about in-band operations, arguing that significant power limitations would have to be imposed on the 1915-1920 MHz band, and also asserts that out-of-band emissions criteria set forth in PCS industry standard, TIA 98-F, should be required to protect incumbent PCS users.[41]

20. Conversely, Nextel, citing a study by Agilent, believes that it is feasible to allow licensed services into the 1915-1920 MHz band.[42] In its comments, it states that Agilent can manufacture a partial band duplexer for the 1915-1920 MHz block that has out-of-band emissions equivalent to that of current PCS handsets. While it states that a full band duplexer cannot yet be produced for the entire existing PCS band plus the 1910-1915 MHz and 1915-1920 MHz blocks, technology continues to advance and they expect future technology to address this challenge. Further, it states that even under worst case, as little as 1.4 meters of separation is needed between handsets to allow 75 percent utilization of the 1915-1920 MHz block. Finally, Nextel states that because several different independent events must simultaneously occur in order for interference to be present,[43] the probability of a user experiencing actual interference is low.

21. In light of commenters' concerns, we conducted our own analysis of the impact on incumbent PCS users with a ten megahertz frequency separation between Broadband PCS mobile and base operations if the 1915-1920 MHz band is redesignated for AWS. The threshold issue here is whether, with a reduction in frequency separation from the current level, AWS operations are technically feasible without impairing incumbent PCS operations. Although we conclude, as discussed below, that this band is suitable for AWS, we do not decide here what technical requirements should be imposed on AWS. Because one goal of the *AWS 2 GHz Service Rules NPRM* is to ensure that we adopt the appropriate technical rules to protect incumbent Broadband PCS users, we will address and plan to adopt the specific technical requirements necessary to provide such protection as part of that proceeding.

22. The purpose of the analysis we conduct here is to determine whether the 1915-1920 MHz should be designated for AWS, not to specify the specific technical parameters for AWS operations. In particular, we address here various technical issues raised by commenters, who question our proposal to reduce the frequency separation between Broadband PCS base and mobile operations and to designate this spectrum for AWS, merely to demonstrate that these issues are not so significant as to preclude such

[39] Motorola Comments to *AWS Third NPRM* at 5; UTAM Comments to *AWS Third NPRM* at 4. *See also* Cingular Comments to *AWS Third NPRM* at 8 (stating that 14 megahertz separation needed to minimize interference in PCS bands).

[40] *See ex parte* Comments of CTIA filed on July 30, 2004.

[41] *See ex parte* Comments of Sprint filed on Sept. 1, 2004.

[42] *See ex parte* Comments of Nextel filed on August 5, 2004.

[43] Some of the conditions cited are: both handsets must be at the very edge of coverage, the interfering handset must transmit at maximum power and the victim receiver must operate at maximum sensitivity. They further state that the places where such interference would be expected to occur such as train stations, airport lounges, and stadiums, are also among the least likely of places to have the type of poor coverage described above. *See ex parte* Comments of Nextel filed on August 5, 2004 at 2.

a decision; appropriate technical constraints for AWS will be addressed in the *AWS 2 GHz Service Rules NPRM*. Because the 1915-1920 MHz band is adjacent to the spectrum licensed under our Broadband PCS rules, and because we anticipate that new licensees are most likely to deploy PCS in this band, we looked at current industry standards, Commission rules, and existing equipment for PCS in conducting this analysis. Currently, the industry uses CDMA as well as GSM (and other TDMA-based) technologies in the PCS bands.[44] For purposes of this analysis, we have worked under the assumption that new entrants into the band are most likely to deploy equipment using technologies based on current Broadband PCS operations. Accordingly, we believe that there are four scenarios to consider: interference from CDMA to CDMA; interference from GSM to GSM; interference from CDMA to GSM; and interference from GSM to CDMA. All parties agree that the risk of interference is only present under certain conditions, *i.e.*, when a mobile transmitter in the 1915-1920 MHz band is operating at a close distance to a mobile receiver.[45] The worst case occurs when the mobile transmitter is operating at maximum power (near the edge of its service area) at the upper edge of the band (near 1920 MHz) and the mobile receiver is trying to receive a weak signal (near the edge of its service area) at the lower edge of the band (near 1930 MHz) and only free space loss is considered.[46]

23. First, our analysis of out-of-band emissions in the worst-case scenario described above relies on Commission rules and industry standards for PCS, as appropriate. As we demonstrate below, AWS in the 1915-1920 MHz band will likely need to operate within stricter out-of-band emission limits than currently applies to PCS operations in the adjacent bands under the Commission's rules. This should not impede the introduction of AWS in the band, however, since we note that industry PCS standards already specify a more stringent limit than the Commission's rules. Although we do not decide here what those limits should be for AWS, we expect that AWS also could meet a more stringent limit. The analysis is straightforward and both CDMA and GSM can be analyzed similarly. We assume that a receiver cannot demodulate a desired signal when an interfering signal or noise is at the same level (*e.g.*, S/I = 0 dB).[47] Thus, we calculate the distance where the undesired signal (Pu) from an interfering transmitter equals the desired signal level and demodulation of the desired signal can no longer occur. We assume that the minimum desired signal (Pd) is equal to the receiver sensitivity of -104 dBm for CDMA and -102 dBm for GSM.[48] Currently the rules for out-of-band emissions for broadband PCS require that the power of

[44]We note that because GSM is a TDMA-based technology, our analysis of GSM herein is applicable to other TDMA technologies such as the US TDMA systems that are employed by carriers such as Cingular, AT&T, and T-Mobile.

[45]*See, e.g.*, *ex parte* Comments of CTIA filed on August 18, 2004; *ex parte* Comments of Sprint filed on Sept. 1, 2004.

[46]Often, this scenario is referred to as the near-far problem.

[47]We believe that assuming S/I = 0 dB results in a valid estimation of the magnitude of interference due to out-of-band emissions. We recognize that a greater S/I may be needed for operation. However, we also note that the industry standards for out-of-band emissions are much more stringent than those required by the Commission (*e.g.*, industry standard out-of-band emission for CDMA is -76 dBm and the Commission only requires -13 dBm; a 63 dB difference). Our analysis is based on the Commission's rules rather than the industry standard. Using any other S/I along with the industry standard would produce separation distances much less than our results. Thus our analysis is conservative.

[48]We note that by setting the desired signal level to the receiver sensitivity, our analysis yields conservative results. For practical reasons, such as providing a fade margin and to allow for handoff, systems operate several dB above the receiver sensitivity. The standard for CDMA specifies a receiver sensitivity of at least -104 dBm. *See* TIA-98-E, Recommended Minimum Performance standards for CDMA 2000 Spread Spectrum Mobile Stations at (continued....)

any emission outside of the authorized operating frequency range must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB,[49] *i.e.*, the signal at the edge of the channel must be -43 dBW (-13 dBm) or less. PCS systems employ a duplexer (filter) at the transmitter output which reduces the out-of-band emission level from current handsets by about 40 dB.[50] Therefore, the maximum out-of-band emissions at the edge of the PCS receive block will be -53 dBm. The undesired signal level is then set equal to the desired signal (Pu = Pd; Pu = -104 dBm for CDMA and -102 dBm GSM). Using our assumption of free space loss, we can compute the distance where the signal from a potentially interfering transmitter attenuates to the same level as the desired signal level. It is important to note that the power of the transmitter is irrelevant to determining the distance because the out of band emissions requires that the signal is at least -43 dBW (-13dBm) or less regardless of the actual transmit power.[51] Therefore, free space loss equals 51 dB (-53 dBm – (-104 dBm)) for CDMA and 49 dB (-53 dBm – (-102 dBm)) for GSM. The corresponding distance where this signal attenuates to these levels is 4.41 meters and 3.50 meters for CDMA and GSM, respectively.[52]

24. Our calculations indicate that for interference to occur between a mobile transmitter and mobile receiver, the two radios would need to be 4.4 meters apart or closer when only the current Commission rules for out-of-band emission limits are considered. In reality, other factors will act to reduce this distance, such as antenna gain (it is assumed that the mobile antenna has a gain of -3 dB) and shielding of the signal by the body or other obstacles. Nevertheless, to reduce the separation distances to 1 meter or less, more stringent out-of-band limits are needed, and we address this issue in the *AWS 2 GHz Service Rules NPRM.*

25. The record demonstrates that technology exists that can meet more stringent standards than the current Commission rules for rejection into the PCS receive block with only a ten megahertz separation.[53] The industry standards are much more stringent than the Commission's -13 dBm out-of-band limit, ranging from -61dBm/MHz to -76 dBm/MHz, depending on the technology used.[54] In addition, Agilent argues that it can produce a split-band duplexer (for 1910-1920 MHz) that would

(Continued from previous page)
3-101, table 3.5.1.2.1. The standard for GSM specifies a receiver sensitivity of at least -102 dBm. *See* 05.05 of the ETSI 3GPP standards, "Radio Access Network: Radio Transmission and Reception."

[49]*See* 47 C.F.R. § 24.238.

[50]Motorola Comments to *AWS Third NPRM* at 5. *See also, ex parte* Comments of Nextel filed on August 5, 2004 at Agilent Study, page 3.

[51]We note that the rules allow mobile transmitters to transmit with a peak eirp of up to 2W. *See* 47 C.F.R. § 24.232(b). However, due to safety concerns over human exposure to RF and battery constraints, handheld transmitters generally only transmit with 200 mW eirp.

[52]Free space loss (FSL) can be calculated using the following formula: FSL = 32.45 + 20*$\log_{10}$(Freq in MHz) + 20*$\log_{10}$(Dist in km). Substituting in the variables gives 51dB = 32.45 + 20*$\log_{10}$(1920) + 20*$\log_{10}$(Dist in km). Solving for Dist gives 0.00441 km or 4.41 meters for CDMA.

[53]*See e.g.*, Agilent Comments to *AWS Third NPRM* at 4-17; *ex parte* Comments of Nextel filed on August 31, 2004.

[54]For example, TIA/EIA-98-F requires out-of-band emissions into the receive mobile band to be -76 dBm/MHz for CDMA which is over 60 dB more stringent than the Commission's rules. We note that GSM and TDMA systems require less stringent out-of-band emission limits, i.e., the standards for GSM and TDMA specify out-of-band emissions into the mobile receive band of -61 dBm/MHz (*See* GSM 05.05) and -65 dBm/MHz (*See* ANSI 136-270), respectively.

provide the same attenuation as those used in current phones.[55] Thus, current technology permits us to consider AWS out-of-band limits that are significantly more stringent than existing Commission PCS rules. For example, if out-of-band emissions for AWS were limited to a level of -60 dBm at the edge of the receive band (at 1930 MHz)which would be comparable to the out-of-band emission limits used for existing GSM and TDMA systems, the operating environment would be no worse than exists today with the three different PCS technologies in use and thus should be sufficient to address out-of-band concerns. For the CDMA case, using -60 dBm as the duplexer rejection into the receive block and ignoring the antenna gain and body shielding, the separation distance where the transmitted signal attenuates to the level of the receiver sensitivity is 2 meters, assuming free space propagation loss.[56] This is comparable to the 1 meter of separation that commenters argue is needed between mobile users and thus is sufficient to protect current PCS systems. Further, this short distance coupled with the low probability of occurrence of the worst-case scenario (both mobiles at the edge of coverage, both operating at the edge of the band, both simultaneously active, and both in close proximity to each other) make interference of this nature highly unlikely. For the GSM case, the worst-case scenario is even less likely to occur when considering that the condition of simultaneous activity is further precluded by the unlikely condition that both units are synchronized and using the same time slot.[57] These issues regarding an appropriate out-of-band emission limit for AWS operations at 1915-1920 MHz are fully explored in the *AWS 2 GHz Service Rules NPRM.*

26. This out-of-band analysis is valid for all four interference cases we identified above – *i.e.*, interference from CDMA to CDMA; interference from GSM to GSM; interference from CDMA to GSM; and interference from GSM to CDMA. However, for the case of potential interference of CDMA to GSM and of GSM to CDMA, there are still other factors that act to mitigate its occurrence. First, CDMA is a spread spectrum technique whereby the power spectral density is low across the 1.25 megahertz bandwidth and the signal looks similar to noise. Since GSM uses only a 200 kilohertz bandwidth, selective filtering would keep the amount of energy from the CDMA signal that could interfere very low. Also, because of the nature of CDMA, it would only appear as noise. Thus, it is possible that a GSM system could experience a slight reduction in range. However, because systems are designed such that adjacent cells overlap in order to allow for handoff, such reduction should have a negligible effect on system performance. In the GSM interference to CDMA case, the disparity in the bandwidths will cause a GSM signal to appear as narrowband interference to CDMA similar to selective frequency fading. Being a spread spectrum technique, CDMA is designed to work under such circumstances (*e.g.*, forward error correction, bit interleaving, etc.). Thus, this situation should not cause significant degradation to a CDMA system. For all the foregoing reasons, we conclude that out-of-band emissions should not pose a serious risk to the introduction of AWS in the 1915-1920 MHz band, provided appropriate technical constraints are imposed, and thus concerns raised by commenters here about out-of-band emissions do not preclude our decision to designate this band for AWS. As we noted above, we explore in the *AWS 2 GHz Service Rules NPRM* issues concerning appropriate out-of-band emissions for AWS in this band and

[55] Agilent states that it can produce a G-H block duplexer that would allow a G-H block handset to comply with the industry out-of-band emission limit of -76 dBm/MHz into the PCS receive band. *See ex parte* Comments of CTIA filed on Aug. 13, 2004 at 2.

[56] For this calculation, the CDMA desired signal is set at the receiver sensitivity of -104 dBm, the undesired signal is also equal to -104 dBm. Setting the signal level into the receiver at an out-of-band emission level of -60 dBm requires that propagation loss must equal 44 dB (-104 dB – (-60 dB) = -44 dB). Substituting this into the formula for free space loss and solving for distance yields: $44 = 32.45 + 20*\log_{10}(1930\text{ MHz}) + 20*\log_{10}(\text{Distance in km})$ and Distance equals $2.0\text{x}10^{-3}$ km or 2 meters.

[57] GSM uses time division multiple access techniques to achieve eight time slots per each 200 kilohertz.

invite additional technical studies.

27. Secondly, we believe that interference due to receiver overload—*i.e.*, when a strong signal, such as the transmit mobile signal, causes a non-linear response in the receiver—is also unlikely if appropriate technical limits are imposed. Currently, the PCS rules specify a power limit of 2 watts eirp.[58] However, due to many factors, such as RF safety and battery life concerns, PCS mobile transmitters generally operate at lower levels. For example, CDMA mobile transmitters generally operate with a peak power of 200 milliwatts eirp (23 dBm), and GSM and TDMA transmitters tend to operate with peak power levels of around 1 watt without causing overload to mobile receivers.[59] Recently, Sprint tested a number of existing PCS phones for susceptibility to degradation caused by overload. This data indicates that six of the seven phones could tolerate an interfering AWS signal at a level of -20 dBm or less without experiencing any degradation and that the worst phone could tolerate a level of about -23 dBm without experiencing degradation.[60] These values represent the measured RF signal power of the AWS transmitter at the antenna port. Sprint concludes from its tests that significant power limitations are needed to avoid adverse impact from overload. We agree with Sprint that some limitations of output power are needed to protect existing PCS operations. For example, if AWS mobile transmissions are limited to 200 mW (23 dBm) or less, we believe that overload concerns would be addressed. An AWS transmitter at 200 mW (23 dBm) will produce -21 dBm or less at the antenna port of a victim receiver at a distance of 1 meter.[61] Based on the above recent Sprint data, six of seven phones would experience no impact from an AWS transmitter at this level. For the worst phone tested, the separation would increase to about 1.5 meters. In practice, these distances would generally be reduced since PCS phones do not generally operate at full power and other propagation factors would tend to mitigate the actual received power. We thus conclude that concerns about receiver overload do not preclude designating this band for AWS, and we will explore the matter of appropriate power limits in the *AWS 2 GHz Service Rules NPRM*.[62]

28. We conclude that AWS operations in the 1915-1920 MHz band are technically feasible with a ten megahertz frequency separation between Broadband PCS mobile and base operations. We recognize, as discussed above, that additional technical constraints may need to be placed on AWS to avoid impairing incumbent PCS operations. Although we conclude here that this band will be designated

[58] 47 C.F.R. § 24.232(b).

[59] *See* equipment authorization database at https://gullfoss2.fcc.gov/prod/oet/cf/eas/reports/GenericSearch.cfm.

[60] *See* Sprint/Nokia Labs Test Results, H Block Overload Test Results, Single Tone Desensitization (Overload) and Duplexer Testing Over Temperature, submitted August 31, 2004.

[61] This is a relatively simple calculation. The maximum transmitted power is 23 dBm. The free space loss for 1 meter at 1900 MHz is 38 dB. The transmitter loss due to body absorption, blockage is 3 dB. The receiver antenna gain is -3 dB. Therefore, the RF power at the antenna port equals -21 dBm (*i.e.*, 23 dBm – 38 dB – 3 dB – 3 dB = -21 dBm).

[62] We note that GSM and TDMA handsets typically operate with peak power levels in excess of those used by CDMA handsets. CDMA handsets generally operate with maximum peak power levels of less than 200 mW, and the peak and average power levels for CDMA are approximately the same. For GSM and TDMA handsets, maximum peak power levels tend to approach levels of 1 watt. However, because each handset only operates during one time slot, the average power level is much lower. For example, because GSM is based on 8 time slots, a phone with a peak power of 1 watt would have an average power of 125 mW (10000 mW/8 time slots). Whether to provide any special consideration for GSM or TDMA systems is discussed further in the *AWS 2 GHz Service Rules NPRM*.

for AWS, one goal of the *AWS 2 GHZ Service Rules NPRM* is to adopt technical rules that will protect existing PCS operations from interference.

29. We also conclude that AWS operations can be deployed in the 1995-2000 MHz band. Several parties contend that technical constraints will need to be placed on new AWS operations in the 1995-2000 MHz band in order to avoid interference to adjacent MSS operations in the 2020-2025 MHz band.[63] However, we note that prior to the reallocation of MSS spectrum in the 1990-2000 MHz band to fixed and mobile services, existing Broadband PCS was immediately adjacent to the MSS. Thus, by redesignating the 1995-2000 MHz for AWS, fixed and mobile services will remain adjacent to MSS.[64] Because we previously determined that PCS can exist adjacent to MSS, we likewise find that the 1995-2000 MHz band is suitable for an AWS designation. As with the 1915-1920 MHz band, we will consider specific technical requirements that are necessary for new AWS entrants as part of the *AWS 2 GHZ Service Rules NPRM.*

iii. Redesignation

30. Given our analysis, above, and our intent to develop technical rules that will protect existing PCS operations from interference, we cannot agree with those commenters that claim that the 1915-1920 MHz band is unsuitable for AWS for technical reasons. We note that some commenters that generally support additional AWS spectrum did not recommend redesignation of the 1915-1920 MHz band, basing their conclusions on the belief that unacceptable and unpreventable interference would occur. For example, in Verizon's comments to the *AWS Third NPRM*, it applauds the Commission for continual efforts to identify and make available additional spectrum that will facilitate provision of wireless services,[65] and yet also opposes the reallocation of 1915-1920 MHz due to PCS guard band concerns.[66] We believe that the wealth of commenters that endorse the designation of additional AWS spectrum as a general matter provide additional support for our specific redesignation of the 1915-1920 MHz band for such use.[67]

31. Nevertheless, we note that some commenters offer alternate proposals for use of the band. Rather than redesignate the 1915-1920 MHz band for new and innovative licensed mobile services, some commenters state that the 1910-1920 MHz band should remain unlicensed – generally though expansion and liberalization of the existing isochronous UPCS rules in order to promote additional voice-based applications in the band – or, in the event that we reallocate the 1910-1915 MHz band segment (the effective action we ultimately undertook in the *800 MHz R&O*), that we should retain the 1915-1920 MHz band for UPCS. Proponents of this option claim that isochronous UPCS should be extended because the current asynchronous designation has not resulted in service, continued low power (UPCS) use would reduce potential interference to high power adjacent band Broadband PCS licensees, and

[63] *See, e.g., ex parte* Comments of TerreStar filed on August 31, 2004; *ex parte* Comments of Satellite Industry Association (SIA) filed on August 31, 2004; *see also ex parte* Comments of ICO Global Communications filed on September 2, 2004.

[64] Petitions for reconsideration relating to our decision to allocate spectrum from MSS are addressed *infra.*

[65] Verizon Comments to *AWS Third NPRM* at 2.

[66] Verizon Comments to *AWS Third NPRM* at 5.

[67] *See, e.g., ex parte* Comments of Nextel filed on September 2, 2004; *ex parte* Comments of T-Mobile USA filed on August 20, 2004.

demand exists to expand unlicensed voice applications beyond the existing ten megahertz.[68] Because the 1915-1920 MHz band is currently lying fallow and no commenter has suggested that asynchronous applications for the band will be developed or deployed in the near future, we agree with commenters who believe that we should take some action to put this band to a higher and more efficient use. Allowing expanded isochronous UPCS operations into this band is one option for doing so. Licensing it for high power AWS use is another.

32. Proponents of an isochronous UPCS expansion claim that there is an interest in and need for more spectrum to deploy unlicensed devices. For example, Ascom and Ericsson contend that by modifying the existing isochronous UPCS rules, we would also be able to promote the use of additional devices such as those meeting the IMT-2000 specifications for unlicensed devices.[69] Similarly, Siemens suggests that by extending isochronous UPCS use to the 1915-1920 MHz band and implementing several technical changes to the Rules, the Commission could allow for the introduction of products using DECT technology into the United States.[70] ICO Global Communications (ICO) and Motorola indicate that the growing demand for UPCS devices and need for more isochronous UCPS spectrum support the expansion of the 1920-1930 MHz band rules into the 1910-1920 MHz band.[71]

33. Other commenters that promote expansion of isochronous UPCS applications into the 1915-1920 MHz band, including UTStarcom, JSM, and PHS MoU, recommend that we modify the rules to support community wireless networks – in particular, the wireless local loop/limited mobility systems associated with the Japanese standard RCR-28 and commonly marketed as the "Personal Handyphone System" (PHS).[72] Such use, these commenters claim, would allow small entities the opportunity to provide new services that are different from those currently available in the licensed service bands,[73] and would permit the deployment of existing technology to areas of lower volume use.[74]

34. As mentioned, *supra,* the lack of UPCS devices operating in the 1910-1920 MHz band has prompted the filing of five petitions for waiver from Lucent, UTStarcom & Drew University, Ascom, Alaska Power, and RBM Communications (RBM); and two petitions for rulemaking from WINForum and UTStarcom, which all request certain rule changes to these bands. In general, these pleadings seek to deploy existing isochronous UPCS equipment in the 1910-1920 MHz band in specific areas where

[68] *See, e.g.,* Ascom Comments to *AWS Third NPRM* at 2; Siemens Comments to *AWS Third NPRM* at 2; Verizon Comments to *AWS Third NPRM* at 6; WCA Comments to *AWS Third NRPM* at 17, 20; *See also* Ericsson Comments to *AWS Third NPRM* at 5 (stating that such an expansion is consistent with current use of spectrum); Siemens Comments to *AWS Third NPRM* at 3 (noting that expansion improves spectrum efficiency and reduces levels of interference, thereby enhancing quality of service); Cingular Comments to *AWS Third NPRM* at 2-3 (supporting retention of 1916-1930 MHz for UPCS).

[69] Ericsson Comments to *AWS Third NPRM* at 5; Ascom Comments to the *AWS Third NPRM* at 2.

[70] *See ex parte* Comments of Siemens Corp., *et. al.* filed in ET Docket 00-258 on December 12, 2003. DECT is a digital wireless technology, which originated in Europe and is used in a variety of wireless applications, including cordless telephones and wireless office telecommunications products.

[71] ICO Comments to *AWS Third NPRM* at 5; Motorola Comments to *AWS Third NPRM* at 8-10.

[72] UTStarcom Comments to *AWS Third NPRM*; JSM Electronics, Inc., Comments to *AWS Third NPRM* at 1; PHS MoU Group Comments to *AWS Third NPRM.*

[73] *See, e.g.,* Midstate Communications, Inc., Reply Comments to *AWS Third NPRM* at 2.

[74] UTStarcom Comments to *AWS Third NPRM* at 2.

additional spectrum is needed to provide high capacity indoor wireless communications, or propose to deploy local wireless systems based on the PHS standards. In an earlier proceeding, we dismissed in part the petitions for waivers and petitions for rulemakings made only with respect to the 1910-1915 MHz band.

35. In its petition for waiver, Lucent requests that it be allowed to use the 1910-1920 MHz band for its Definity PBX voice system within the confines of Cook County, Illinois. It claims that several of its customers need high-capacity indoor wireless communications and that the existing ten megahertz of spectrum reserved for voice in the 1920-1930 MHz band is insufficient to meet those needs. Also, UTStarcom & Drew University request permission to use the 1910-1920 MHz band to install the UTStarcom Personal Access System (PAS) on the campus of Drew University in Madison, New Jersey, in order to provide wireless telephone service to the students and staff, as an extension of the university's wired telephone system. It states that the PAS system complies with Japan's PHS Standard RCR-28 but does not meet Part 15 requirements for either isochronous or asynchronous devices and typically operates at higher power levels than mandated by Part 15. It further states that once Broadband PCS Block C licensees are selected in Auction #35 (for the 1895-1910 MHz band paired with the 1975-1990 MHz band) it would be possible to negotiate use of that spectrum on the Drew University campus with the winning licensee. Also, Ascom requests that it be allowed to use the 1910-1920 MHz band for its Freeset DCT 1900 PBX voice system within the confines of Cook County, Illinois; New York City; and San Francisco County, California, because several of its customers, who are boards of trade or stock exchange entities, need high-capacity indoor wireless communications. Ascom submits that the ten megahertz of spectrum reserved for voice in the 1920-1930 MHz band is, again, insufficient to meet such needs. In addition, Alaska Power requests a waiver of Part 15 asynchronous spectrum etiquette to operate a community wireless voice system over the 1910-1920 MHz (data) band, in order to serve small rural areas in Alaska that are currently unserved or underserved by wireless service providers. Finally, in its waiver request, RBM requests permission to operate voice devices in the 1915-1920 MHz band for providing low-power fixed wireless local loop telephone service in Las Vegas, Nevada. More specifically, RBM requests that the Commission waive Sections 15.319 and 15.321 of the Rules to provide their service as an enhancement of its competitive local exchange carrier.

36. In its petition for rulemaking, WINForum asks the Commission to allow isochronous UPCS devices to use the 1910-1920 MHz band and to phase out asynchronous use in this band, thereby providing twenty megahertz of spectrum (1910-1930 MHz) for isochronous devices, and also to modify certain technical requirements for UPCS devices in Part 15. WINForum further requests that the Commission modify the frequency stability requirements for asynchronous UPCS data devices.[75] In its petition, UTStarcom requests that the 1910-1920 MHz band be made available for licensing via competitive bidding to permit the establishment of community wireless network service, using PAS which is based on Japan's RCR-28 PHS standard.[76] Subsequently, UTStarcom modified its requests to seek changes to the Part 15 rules for coordinated unlicensed operation in the 1910-1920 MHz band for its PAS system, with coordination performed by UTAM, using the existing UTAM coordination

[75] *Id.*, at 15-16. Currently, 47 C.F.R. §15.321(e) requires the measurement of the carrier frequency in order to ensure its frequency stability. WINForum believes that for asynchronous data devices that transmit in short bursts, explicit measurement of the carrier frequency as a function of time for a short modulated burst is inherently problematic. WINForum's proposal would allow for a more realistic measurement of the frequency stability of the device.

[76] *See* UTStarcom Petition at 2.

infrastructure.[77]

37. We agree with the commenters and petitioners that an expansion of the isochronous UPCS rules is preferable to the current inefficient use of the 1915-1920 MHz band. However, we cannot conclude that expanded UPCS use is preferable to the types of high powered licensed applications that the band could support by being redesignated for AWS applications. Operations in the existing Broadband PCS bands have been extremely successful and with new data offerings becoming available, carriers expect subscribership to continue to experience substantial growth. Thus, this additional spectrum will help to ensure that providers have sufficient spectrum to accommodate these new services and additional subscribers. The proven public demand for licensed mobile services that are expected to provide the foundation for AWS applications and the need to provide additional spectrum to support their continued deployment will allow us to put this spectrum to a higher use than it can serve as an expansion of UPCS.

38. As part of our proposal to reallocate the 1910-1920 MHz band (or a portion thereof) in the *AWS Third NPRM*, we also proposed options for pairing the 1910-1920 MHz band with the 1990-2000 MHz band for reallocation to AWS, expansion of Broadband PCS, or for the relocation of existing services.[78] The 1915-1920 MHz band is particularly well suited for such use because of its adjacency to and identical frequency separation with the existing Broadband PCS. Pairing 1915-1920 MHz with 1995-2000 MHz would benefit from the design of high power PCS equipment in the adjacent Broadband PCS bands, which in turn would promote the rapid design and deployment of new systems and result in economies of scale. Such a pairing would, as a practical matter, increase the deployment options available to new licensees under an AWS designation. Also, this pairing would maximize the value of the spectrum by achieving greater spectrum efficiency.

39. We also find that due to similar characteristics and proximity to Broadband PCS, the 1915-1920 MHz and 1995-2000 MHz band pairing is comparable to the 1910-1915 MHz and 1990-1995 MHz band pairing we adopted in the *800 MHz R&O*.[79] Accordingly, we conclude that those comments that relate to use of the 1910-1915 MHz and 1990-1995 MHz bands as paired AWS spectrum are also applicable to the 1915-1920 MHz and 1995-2000 MHz paired bands.[80] For instance, pairing the 1915-1920 MHz and 1995-2000 MHz bands would allow for the rapid introduction of terrestrial wireless services. Many potential high-power licensed mobile service providers are designed to operate on distinct base station transmit and mobile receive bands that incorporate adequate frequency separation between the bands. Thus, paired use of these two five megahertz blocks is consistent with many possible technologies, including the IMT-2000 standards that are widely expected to be employed in the provision of AWS.

40. Thus, we find that the 1915-1920 MHz band will allow for the deployment of AWS applications, and is particularly well suited for this purpose when paired with the 1995-2000 MHz band. By contrast, many of the proposals for expanded unlicensed voice applications relate to discrete

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[77] *See* UTStarcom Reply Comments to *AWS Third NPRM* at 3.

[78] *AWS Third NPRM*, 18 FCC Rcd at 2247-2248, ¶¶ 47-49.

[79] The 1910-1915/1990-1995 MHz pairing was adopted and licensed in the *800 MHz R&O*.

[80] Because the 1995-2000 MHz portion of this band pairing is closer to the 2000-2020 MHz MSS band than the 1990-1995 MHz portion of the 1910-1915 MHz/1990-1995 MHz band pairing, we recognize that there are differences in adjacent band interference considerations for the bands. These matters are best addressed in the *AWS 2 GHz Service Rules NPRM*.

geographic regions or are based on an expansion of existing UPCS applications in specific urban markets where parties claim there is robust UPCS use in specialized environments, such as stock and commodity exchanges. We further note that the record indicates that while systems based on the PHS technology can be deployed in the 1915-1920 MHz band, such use would be at the upper end of the spectrum in which they have been designed to operate and would somewhat limit the scope of operation. For example, UTStarcom states that entities using this five megahertz block could offer local loop voice services in smaller communities and in-building wireless loop applications in urban settings, but that to do so it would have to eliminate a two megahertz guard band between PHS and isochronous UPCS spectrum and move the PHS control channels into the band, and that PHS applications would have the effect of reducing the capacity of UPCS operations that are in close proximity to the new PHS systems.[81] The PHS MoU Group indicates that while PHS can operate in the 1915-1920 MHz band, it will be necessary to use additional spectrum in order to provide data applications.[82] Because the *800 MHz R&O* took the 1910-1915 MHz band out of consideration for continued UPCS use, new UPCS applications that are based on an extension and modification of the isochronous UPCS rules – including PHS systems – would be able to use no more than five megahertz of additional spectrum. Taken together, all of these factors serve as limitations on the ultimate utility of the 1915-1920 MHz band as isochronous UPCS spectrum.

41. Based on our determination that additional spectrum is needed for AWS use, and because the characteristics of the 1915-1920 MHz band that make it well suited for such use, we conclude that such a designation will promote efficient use of the spectrum, allow for the rapid introduction of high-value services, and is otherwise preferable to the other option that has been put forth – introduction of isochronous UPCS rules into the band. Based on our discussion above, we find that it is technically feasible to introduce AWS in the band without impairing incumbent PCS with a separation distance between the Broadband PCS mobile and base transmit bands of ten megahertz, and we intend to develop technical rules to ensure that AWS in this band will not interfere with existing PCS operations. Further, we conclude that, given the opportunity, licensees and manufacturers will develop equipment and business plans that put this spectrum to use that will benefit the public. For these reasons, and given the lack of unlicensed use of the 1915-1920 MHz band under the existing rules, we find that the public interest is best served by redesignating five megahertz of spectrum in the 1915-1920 MHz band for AWS on a primary basis to support the types of high powered mobile applications associated with AWS and Broadband PCS expansion and pairing it with the five megahertz of spectrum at 1995-2000 MHz that we previously designated for AWS. Accordingly, we modify the Table of Allocations to reflect the applicable rule parts for these services, and update Part 15 rules to remove the 1915-1920 MHz band from asynchronous UPCS use. Because their pleadings are inconsistent with the AWS designation for the 1915-1920 MHz band we adopt herein, we deny the waiver petitions from Lucent, Ascom, Alaska Power, RBM, and UTStarcom & Drew University.[83] We likewise deny the petitions for rulemaking from

[81] UTStarcom Comments to *AWS Third NPRM* at 3.

[82] PHS MoU Group Comments to *AWS Third NPRM* at 2; *see also* JSM Electronics Inc. Comments to *AWS Third NPRM* at 2 (stating that "we could deploy systems to provide just voice service on 5 MHz but more spectrum is required for a combination of voice and data").

[83] In addition, we note that Auction #35 was completed on January 26, 2001, making the conditions on which the waiver petition from UTStarcom and Drew University was predicated no longer applicable *Public Notice*, DA 01-211 (rel. Jan. 29, 2001). *See also* the Commission's auctions homepage for Auction 35 at http://wireless.fcc.gov/auctions/35/ (listing subsequent events affecting licenses issued in the band). We also note that the unavailability of the 1910-1915 MHz band would appear to preclude use of the PHS system that UTStarcom and Drew University seek to use in their petition.

WINForum and UTStarcom.

42. We discuss in greater depth, below, relocation and reimbursement procedures to accommodate incumbent users in these bands. We also address rule modifications that we can make in the remaining UPCS frequencies – *i.e.* the 1920-1930 MHz band – to promote deployment of the expanded voice-based applications, such as those using DECT technology, that commenters have sought to deploy throughout the UPCS spectrum.

B. 2020-2025 MHz and 2175-2180 MHz Bands

43. *Background.* In the *AWS Third R&O*, the Commission reallocated the 2020-2025 MHz band to Fixed and Mobile services on a primary basis to promote the introduction of new advanced services, but did not specify how services could best be structured in the band.[84] The 2020-2025 MHz band was among the spectrum that had been previously allocated to MSS for uplinks on a primary basis, and is currently used by BAS incumbents who are transitioning to a more spectrally efficient channel plan in the 2025-2110 MHz band. The *AWS Third NPRM* sought comment on the potential uses of the 2020-2025 MHz band, including pairing this five megahertz block with an equal-sized amount of spectrum in the 2155-2180 MHz band.[85] The *AWS Third NPRM* asked for specific band plans, frequency pairings, and technical limitations needed to protect adjacent band operators, including MSS operations (including terrestrial operations by a MSS licensee under its Ancillary Terrestrial Component (ATC) authorization) in the 2000-2020 MHz and 2180-2200 MHz bands.

44. Our proposals generated a wide variety of suggestions, as commenters indicated that this band could be used to promote both new technologies – such as AWS in paired and unpaired configurations – as well as be used as spectrum for displaced services, such as relocated Federal Government licensees or UPCS. CTIA, for example, recommends that the 2020-2025 MHz band should be made available for AWS use, but notes that such use would need to account for potential interference to and from adjacent operations.[86] Motorola notes that the band has 'limited utility' for AWS due to its size, frequency separation from other AWS blocks, and proximity to the MSS uplink band.[87] AT&T Wireless suggests that the block could either be used as unpaired spectrum suitable for TDD technologies, or as relocation spectrum for government operations displaced from the 1710-1755 MHz band.[88] In addition, Ad Hoc states that this band should be used as replacement spectrum for displaced UPCS at 1.9 GHz.[89] Lastly, SBE, among others, claims that PCS-like services (including AWS)

[84] *AWS Third R&O*, 18 FCC Rcd at 2238, ¶ 28.

[85] *Id.*, 18 FCC Rcd at 2255, ¶ 69.

[86] CTIA Comments to *AWS Third NPRM* at 5.

[87] Motorola Comments to *AWS Third NPRM* at 13. The adjacency to MSS uplink spectrum, Motorola claims, makes the band ill suited as an AWS base station transmit band. *Id.*

[88] AT&T Reply Comments to *AWS Third NPRM* at 7. *See also* Cingular Comments to *AWS Third NPRM* at 9; CTIA Comments to *AWS Third NPRM* at 5-6; Motorola Comments to *AWS Third NPRM* at 14; Verizon Comments to *AWS Third NPRM* at 8-9; AT&T Reply Comments to *Third NPRM* at 7; Ericsson Reply Comments to Third NPRM at 3-4 (supporting Verizon proposal for DoD relocation); WCA Reply Comments to *AWS Third NPRM* at 8.

[89] Ad Hoc Comments to *AWS Third NPRM* at 5; Verizon Comments to *AWS Third NPRM* at 9 (considering spectrum suitable for displaced UPCS as alternative solution to Federal Government relocation); WCA Comments to *AWS Third NPRM* at 23; SBE Reply Comments to *AWS Third NPRM* at 3.

operating in the 2020-2025 MHz band would cause interference to and receive interference from adjacent BAS operations in the 2025-2110 MHz band.[90] Ericsson, in its comments to the *AWS Third NPRM*, originally recommended the creation of a paired spectrum block at 2020-2025 MHz and 2175-2180 MHz. Doing so, Ericsson stated, would increase spectrum efficiency by designating bands that are compatible with adjacent services, creating valuable contiguous spectrum.[91] However, in response to the SBE filing, Ericsson concludes that the value of the paired band would be diminished due to the potential for interference to and from adjacent BAS operations, and instead endorses other comments that recommend that the band be used for the relocation of Federal Government operations.[92]

45. *Decision.* As an initial matter, we recognize that many of the comments have been outdated by more recent developments in this proceeding. For example, some of the bands identified by commenters are no longer available to be paired. We also reject those comments that would have us make this band available for Federal Government operations because we have already proposed relocation procedures that would not require Federal Government relocation into the band.[93] Moreover, such a designation would limit use of this spectrum by the public and would require us to re-evaluate our BAS relocation procedures to accommodate the entry of Federal Government users in the band. We also disagree with those commenters that support relocating displaced UPCS to this five megahertz block, given our previous analysis of asynchronous UPCS operations, the conclusion that there are no current operations to be displaced, and our findings that additional AWS spectrum will promote new technologies and services, make efficient use of the spectrum, and use the spectrum to its highest potential.

46. As part of our decision to redesignate the 2020-2025 MHz and 2155-2180 MHz bands in the *AWS Third R&O*, we also proposed options for pairing the 2020-2025 MHz band with spectrum in the 2155-2180 MHz band for new Fixed and Mobile services, including AWS. Because these bands have been redesignated for AWS, we find the 2020-2025 MHz band suitable for pairing with the 2175-2180 MHz band. We also note that AWS entrants may also benefit from the introduction of terrestrial services in the adjacent MSS band under MSS/ATC authority. Pairing 2020-2025 MHz with 2175-2180 MHz could benefit from the design of equipment in the adjacent MSS spectrum – in particular, equipment deployed to provide MSS/ATC service – which in turn could allow for potential economies of scale and generally promote the more rapid deployment of new service offerings.[94]

47. We are cognizant of the technical considerations that the licensees must account for in

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[90]Motorola Comments to *AWS Third NPRM* at 13; WCA Comments to *AWS Third NPRM* at 23; SBE Reply Comments to *AWS Third NPRM* at 1-3.

[91]Ericsson Comments to *AWS Third NPRM* at 7-8.

[92]Ericsson Reply Comments to *AWS Third NPRM* at 3.

[93]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, *Fourth Notice of Proposed Rulemaking*, 18 FCC Rcd 13235 (2003) ("*AWS Fourth NPRM*").

[94]Although MSS licensees may be interested in acquiring this AWS spectrum in order to provide additional terrestrial services that would complement their MSS (and ATC) offerings, we note that such use would be under the terms of the AWS licensing and service rules we ultimately adopt, and that MSS entities would operate as a terrestrial licensee and would have to secure a separate license to operate in the 1915-1920/1995-2000 MHz band pairing.

developing systems in such close proximity to BAS operations in the 2025-2210 MHz band, and note that some commenters raised concerns about the potential for adjacent channel interference to BAS receivers.[95] In recent proceedings, we have addressed similar concerns and found similar spectrum to be suitable for terrestrial use.[96] Moreover, in the companion *AWS 2 GHz Service Rules NPRM*, we seek comment on the specific technical limits necessary to protect adjacent operations while permitting AWS use of the band. As a general matter, however, we continue to believe that the 2020-2025 MHz band is best suited for AWS use, and that potential licensees will ultimately have sufficient flexibility to put this spectrum to its best use.

C. Relocation and Reimbursement

i. Relocation and Reimbursement in the 1915-1920 MHz Band

48. *Background.* In the *AWS Third NPRM*, we proposed that if we were to reallocate all or a portion of the 1910-1920 MHz band, we would implement a reimbursement plan that would repay UTAM a percentage of the expenses it incurred in clearing the UPCS band of microwave links.[97] We sought comment on this proposal and the method by which UTAM should be repaid. Those parties that commented on this issue generally agree with our proposal, and support the adoption of a reimbursement plan that would compensate UTAM for its expenses.[98]

49. UTAM, which supports retention of the entire 1910-1920 MHz band for UPCS, also states that in the event we reallocate spectrum in this band, we must ensure that new licensees fully and fairly compensate UTAM for the relocation of incumbent microwave users. In its comments, UTAM generally concurs that the reimbursement plan we proposed – which is based on the cost-sharing model we previously adopted for the relocation of microwave incumbents to allow for the introduction of licensed PCS – would provide such compensation.

50. In addition, UTAM raises several points as to how we should implement a reimbursement plan for reallocated UPCS spectrum. First, UTAM states that its compensation must be adjusted to include the base *pro rata* percentage of total costs it has incurred. To do this, UTAM notes that certain of its microwave relocation cost-sharing obligations are being paid in installments for links that have been moved by third parties, and asks that it be compensated for the pro-rata share of the present value of

[95] *See, e.g.*, SBE Comments to *AWS Third NPRM* at 2-3. For example, one factor to consider when addressing adjacent channel operations is the that some licensees in this band can operate nationwide even though they are licensed for a specific market. An example of this is CARS mobile licenses issued to C-SPAN.

[96] *See* Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands, IB Docket No. 01-185, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd 1962 (2003) (*"ATC Report and Order"*) at 1973-1999. In that proceeding, to address out-of-band emissions interference, we required ATC mobile terminal emissions above 2025 MHz to be attenuated by at least 70 + 10 log P dB, measured in a one megahertz or greater bandwidth. *See id.* at 2025-26. AWS mobile terminal emissions above 2025 MHz attenuated by the same amount will fall well below the -50.8 dB adjacent channel leakage ratio (ACLR) which SBE contends is necessary to protect BAS receivers for harmful interference. *See* SBE Comments to *AWS Third NPRM* at 4.

[97] *AWS Third NPRM*, 18 FCC Rcd at 2238, ¶¶ 29-30.

[98] UTAM Comments to *AWS Third NPRM* at 6-7; Nextel Comments to *AWS Third NPRM* at 15-16; PCIA Comments to *AWS Third NPRM* at 4-5.

these future costs in one lump sum.[99] Second, UTAM states that new licensees should be required to follow the same cost-sharing rules as existing licensees that are adjacent to the UPCS band. In other words, if UTAM relocates a microwave link that accrues to the benefit of a new licensee, UTAM believes that the new licensee should be responsible for paying the relocation costs proportionate to the number of licenses benefiting from the relocation. This same cost-sharing obligation would apply to UTAM paying for reimbursement if a licensee relocated a link that accrued to the benefit of UTAM's members.[100] Also, UTAM states that a new licensee should, as a precondition to the grant of a license, be required to make its reimbursement payment to UTAM. This precondition, UTAM claims, would be similar to that of the payment of auction funds as a prerequisite to licensing. New licensees would therefore be able to factor the microwave relocation payment into a licensee's bidding strategy, in the event the spectrum is auctioned.[101] Finally, UTAM suggests that we consider allocating reimbursement costs among multiple new licensees entering the band by POPs as an effective, simple, and manageable means of cost recovery.[102] We note that in the companion *AWS 2 GHz Service Rules NPRM* the Commission seeks comment on the licensing scheme in the 1915-1920 MHz band. Therefore, we take no action with respect to UTAM's comments concerning schedule of reimbursement. Rather, UTAM may raise these issues in response to the *AWS 2 GHz Service Rules NPRM.*

51. Nextel agrees with our proposal for reimbursing UTAM's incurred relocation costs. PCIA, which also supports our general relocation proposal, proposes that we establish a band-clearing cost-sharing clearinghouse to manage the relocation compensation in the allocation of UPCS bands to AWS.[103] PCIA states that many AWS licensees would benefit from UTAM relocating incumbent microwave links from the UPCS bands, because AWS licensees licensed in different geographic service areas could cause interference to or receive interference from a single incumbent licensee. PCIA asks that we develop a band-clearing cost-sharing clearinghouse, similar to the cost-sharing procedures for PCS in Part 24 of the Commission's Rules, to provide reimbursement for UTAM and incumbents.[104]

52. We note that in the *800 MHz R&O*, the Commission adopted a reimbursement plan that obligated Nextel to reimburse UTAM twenty-five percent – on a *pro rata* basis – for the costs incurred for relocating microwave incumbents from the 1910-1915 MHz band.[105] Nextel has to pay this amount before it begins operations in the band. After this time, Nextel and UTAM can seek reimbursement - based on actual costs – for costs incurred for clearing incumbents that benefits spectrum whose relocation obligations would otherwise be borne by the party that is responsible for that band. These rules take effect as of the date in which Nextel receives its nationwide license for the 1910-1915 MHz

[99]UTAM Comments to *AWS Third NPRM* at 6.

[100]UTAM Comments to *AWS Third NPRM* at 6.

[101]UTAM Comments to *AWS Third NPRM* at 7.

[102]UTAM Comments to *AWS Third NPRM* at 7. POP is an abbreviated term for population used by the Commission. One pop equals one person. The Commission currently uses the 1990 census as a measure of population.
See http://wtbnt01g.fcc.gov/cgi-bin/web/internetpull/page.pl?url=http://wireless.fcc.gov/auctions/glossary.html.

[103]Cost-sharing procedures for relocation of microwave incumbents are found in § 24.239 through § 24.253 of the Commission's Rules.

[104]PCIA Comments to *AWS Third NPRM* at 4-5.

[105]*800 MHz R&O* at ¶¶ 239-249.

band. Because a reimbursement plan has been established for the 1910-1915 MHz band between Nextel and UTAM in the *800 MHz R&O*, we address the above comments as they pertain to the 1915-1920 MHz band.

53. *Decision.* In conjunction with our redesignation of the 1915-1920 MHz band for AWS, we find that UTAM must be fully and fairly reimbursed for relocating incumbent microwave users in this band. We agree with commenters that UTAM should be made whole for the investments it has made in clearing the UPCS bands. Accordingly, UTAM is entitled to reimbursement of twenty-five percent – on a *pro-rata* basis – of the total costs it has incurred, including its future payment obligations for links it has relocated, as of the date that a new entrant gains access to the 1915-1920 MHz spectrum band. A new AWS licensee in the 1915-1920 MHz band must pay this amount before it begins operations in the band, and under any specific terms or conditions that we adopt in the *AWS 2 GHz Service Rules NPRM.*

54. Our decision to require new entrants in the 1915-1920 MHz band to reimburse UTAM a *pro rata* share of costs, in addition to being consistent with the comments supporting a reimbursement mechanism for UTAM, offers a fair and easy procedure to implement. Because UTAM has already cleared most of the incumbent microwave links deployed across the entire 1910-1930 MHz band, this reimbursement plan represents the most reasonable and easiest approach to address the relocation costs that UTAM has already incurred. We believe that such a course is superior to the difficult and complex prospect of making retroactive calculations for apportionment and represents an equitable and administratively efficient means of compensating UTAM. We note that no party has objected to this approach.

55. We also agree with UTAM that we should apply the same cost-sharing obligations to new entrants that we have imposed on licensees on channels that are adjacent to the UPCS bands with respect to subsequent band clearing expenses.[106] Thus, we will allow a new entrant in the band – whether it is an AWS licensee, UTAM, or Nextel (which was assigned the 1910-1915 MHz band in the *800 MHz R&O*) – to seek reimbursement for the proportion of any additional relocation costs that benefits spectrum whose relocation obligations would otherwise be borne by the party that uses or is otherwise responsible for that spectrum band. For example, if in order to make spectrum in the 1915-1920 MHz band available for use after it has paid its *pro rata* share of UTAM's band clearing expenses, an AWS licensee relocates incumbent microwave links that remain in both the 1915-1920 MHz and the 1920-1930 MHz spectrum, the AWS licensee may seek reimbursement from UTAM for the actual costs associated with the relocation of microwave facilities in the 1920-1930 MHz band.[107] The same reimbursement scheme would apply between the new entrant and Nextel for any microwave links in both the 1910-1915 MHz and 1915-1920 MHz spectrum bands that are relocated prior to the time that Nextel calculates its band clearing expenses pursuant to the band clearing offset process established in the *800 MHz R&O.*[108] Similarly, we will allow UTAM to recover any additional expenses incurred in clearing incumbent fixed

[106]UTAM Comments to *AWS Third NPRM* at 6.

[107]Thus, new entrants' future relocation obligations will not necessarily represent a 25 percent share of any future microwave relocation costs in the 1910-1930 MHz band. If UTAM funds the relocation of a paired microwave link where only one half of the paired link operates in the 1915-1920 MHz band and the relocation costs are evenly divisible between both links, then the new entrant would be liable to reimburse UTAM for one half of the total relocation costs associated with that paired link. This same reimbursement applied to UTAM will also pertain to Nextel if it funds any relocation.

[108]Once Nextel receives credit for any relocation expenses for microwave links in the 1915-1920 MHz band as part of the band clearing offset process established in the *800 MHz R&O*, it will not be entitled to seek reimbursement from new AWS entrants for these previously credited expenses.

microwave systems in the 1920-1930 MHz band that are attributable to clearing the 1915-1920 MHz band. To implement our decision with respect to the 1915-1920 MHz band, we are amending our rules to reflect this reimbursement plan.[109]

56. We find it unnecessary to establish a cost-sharing clearinghouse, as suggested by PCIA, at this time. As an initial matter, we do not agree that the 1915-1920 MHz band will have the same complexities that were present in the Broadband PCS spectrum that led to the adoption of the cost-sharing clearinghouse procedures that PCIA would have us use as a model. Because UTAM has cleared most of the microwave incumbents from the 1910-1930 MHz band, new AWS entrants in the five megahertz of former UPCS spectrum will need to coordinate reimbursement payments with UTAM and – perhaps – a few remaining incumbent microwave licensees in the 1915-1920 MHz band, Nextel, other AWS licensees in the 1915-1920 MHz band, and/or MSS licensees for any residual microwave link relocations not already undertaken by UTAM. By contrast, entrants in the much larger Broadband PCS bands subject to the cost-sharing clearinghouse did not have the benefit of UTAM having already largely cleared the bands of microwave incumbents. In a similar vein, to the extent that AWS licensees in the BAS bands (1995-2000 MHz and 2020-2025 MHz) actually incur relocation obligations, they will join Nextel and MSS licensees in an already established relocation process whose incumbent BAS licensees will be relocated market-by-market. This scenario may be sufficiently different, from the more complex link-by-link relocation that was required for Broadband PCS deployment, to make a cost-sharing clearinghouse unnecessary. We also note that because the companion *AWS 2 GHz Service Rules NPRM* seeks comment on licensing the AWS bands using a geographic area licensing scheme, it would be difficult to set forth a comprehensive cost-sharing clearinghouse plan now. In fact, we can envision scenarios – such as adoption of a single nationwide license for the AWS bands – in which there would be no cognizable role for a clearinghouse administrator.

ii. Relocation and Reimbursement in the 1995-2000 MHz and 2020-2025 MHz Bands

57. The 1990-2110 MHz band (2 GHz BAS band) is currently used extensively by the BAS for mobile TV pickup (TVPU) operations, including electronic newsgathering (ENG) operations to cover events of interest.[110] The original 2 GHz BAS channel plan divided the band into seven channels, each consisting of between 16.5 and 18 megahertz.[111] In the *MSS Second R&O*, the Commission reallocated

[109]See 47 C.F.R. § 24.239 and § 24.247 in Appendix A *infra*. We note that the *AWS 2 GHz Service Rules NPRM* proposes to license the 1915-1920 MHz band under Part 27. If necessary, we will modify our rules to ensure that the reimbursement right we establish for UTAM herein is reflected in the rule part under which we ultimately adopt service rules for the band.

[110]A TVPU station is a land mobile station used for the transmission of TV program material and related communications from scenes of events back to the TV station or studio. *See* 47 C.F.R. § 74.601(a) (listing classes of TV broadcast auxiliary stations). The band is also used by fixed BAS operations such as studio-transmitter link (STL) stations, TV relay stations, and TV translator relay stations, but the majority of those operations are in higher frequency bands allocated to the BAS. *See* 47 C.F.R. §74.601(b). *See generally* 47 C.F.R. §74.600 ("Eligibility for license"). In addition, BAS spectrum in the 2 GHz band is authorized for use by the Cable Television Relay Service (CARS) and the Local Television Transmission Service (LTTS). *See* 47 C.F.R. §§ 74.602, 78.18(a)(6) and 101.801. We will refer to these services collectively as "BAS," and all decisions apply to CARS and LTTS operations in the band, as well as to BAS.

[111]The original 2 GHz BAS channel plan, which is still in use, is as follows: Channel 1 (1990-2008 MHz), Channel 2 (2008-2025 MHz), Channel 3 (2025-2042 MHz), Channel 4 (2042-2059 MHz), Channel 5 (2059-2076 MHz), Channel 6 (2076-2093 MHz), and Channel 7 (2093-2110 MHz).

the 1990-2025 MHz segment to the MSS and established a relocation plan for incumbent BAS.[112] The Commission adopted a two-phase relocation plan with a cutover schedule based on market size in which the BAS would eventually have access to seven 12 megahertz channels in the 2025-2110 MHz band at the end of the transition.[113] The Commission also identified four broad categories of BAS markets – "LA" (Los Angeles television market), "Metro" (remaining top 30 television markets), "Light" (television markets 31-100), and "Rural" (television markets 101 and above).[114] The Commission specified different relocation schedules for BAS facilities based on the size of the market.[115] For example, BAS incumbents in markets 1-30 were to be relocated on an earlier schedule than incumbents in markets 31-100.

58. In the *MSS Third R&O,* the Commission modified the plan that 2 GHz MSS licensees were to follow when relocating incumbent BAS licensees in the 1990-2025 MHz band.[116] The modified plan provides for the relocation of BAS licensees to the 2025-2110 MHz band in a single step, retains the distinction of BAS licensees by market size, and requires the relocation of those licensees within the time periods specified for their respective market categories.[117] The Commission also noted that, subsequent to its establishment of the BAS relocation plan, it had reallocated fifteen megahertz of spectrum in the 1990-2025 MHz band for new AWS entrants.[118] The Commission concluded that it was necessary to give these new AWS entrants a realistic opportunity to seek early use of the band in exchange for the relocation of incumbent users, while minimizing the disruption to BAS incumbents to the extent possible.[119] The Commission found that, given the need to provide for rapid introduction of AWS in the

[112] *See* 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, *Second Report and Order and Second Memorandum Opinion and* Order, 15 FCC Rcd 12315 (2000) ("*MSS Second R&O*").

[113] The Phase I channel plan – an interim channel plan using 102 megahertz of spectrum at 2008-2110 MHz during the transition – consisted of seven channels (six 14.5-megahertz-wide channels and one 15-megahertz-wide channel). The Phase II channel plan consisted of seven channels (six 12.1-megahertz-wide channels and one 12.4-megahertz-wide channel) within the final 85 megahertz of spectrum at 2025-2110 MHz.

[114] *MSS Second R&O*, 15 FCC Rcd at 12323, ¶ 19.

[115] *MSS Second R&O,* 15 FCC Rcd at 12326-27, ¶¶ 29-32.

[116] *MSS Third R&O*, 18 FCC Rcd 23638. In the *MSS Third R&O,* the Commission also modified the plan for relocating incumbent FS microwave licensees in the 2180-2200 MHz band to specify appropriate interference standards and relocation guidelines that new Fixed and Mobile licensees should use when entering the band. Any 2 GHz MSS system that can share spectrum with BAS and/or FS incumbents is exempt from relocation obligations in the band it can share. *Id.* at 23669-80 ¶¶ 62-63, 23671 ¶ 68.

[117] The new BAS channel plan consists of seven 12-megahertz-wide channels and two 500-kilohertz data return link (DRL) channels. *MSS Third R&O*, 18 FCC Rcd at 23666, ¶ 55.

[118] *See* note 16 *supra.*

[119] *MSS Third R&O*, 18 FCC Rcd at 23653-61, ¶¶ 29-44. The Commission noted that, although some time will be required to establish service rules and license new Fixed and Mobile entrants before they can secure entry into the band, the entry of these new AWS licensees may occur relatively quickly. Thus, the Commission expected the band to be used more fully and more quickly by the combination of the remaining MSS licensees and new AWS licensees than was anticipated in the *MSS Second R&O*, when the band was to be exclusively used by MSS licensees whose systems were expected to be deployed and to grow consistent with then distant milestones.

2 GHz BAS band, a two-phase relocation was no longer appropriate.[120]

59. In order to provide early access to the 1990-2025 MHz spectrum for MSS licensees while maintaining the integrity of the BAS system, the Commission set up a negotiation structure that provided for a one-year mandatory negotiation period, consistent with those procedures established in the *Emerging Technologies* proceeding.[121] Under this structure, incumbent BAS licensees in television markets 1-30 were required to negotiate in good faith with the new MSS entrant to facilitate relocation from the band.[122] Upon expiration of the mandatory negotiation period, the new MSS entrant could involuntarily relocate incumbent BAS licensees to the seven narrower channels in the 2025-2110 MHz band that make up the revised BAS channel plan.[123] Once BAS licensees in markets 1-30 and all fixed BAS stations, regardless of market size, had been relocated, MSS licensees could begin their nationwide operations in the 2000-2020 MHz band. On the date the first MSS licensee begins operations, all BAS licensees in markets 31-210 were required to cease operations on existing channels 1 and 2 (1990-2025 MHz) and BAS operations would no longer be permitted in that spectrum.[124] Also on this date, a one-year mandatory negotiation period would begin between MSS licensees and BAS incumbents in markets 31-210. Although MSS licensees may involuntarily relocate BAS incumbents at any time after the expiration of the one-year mandatory negotiation period, BAS incumbents in markets 31-100 must be relocated to the seven narrower channels in the 2025-2110 MHz band that make up the revised BAS channel plan within three years of the date the first MSS licensee begins operations, and BAS incumbents in markets 101-210 must be relocated within five years of this date.[125]

60. *Nextel-BAS Relocation Plan.* Recently, in the *800 MHz R&O*, the Commission addressed

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[120]The Commission determined that the initiation of the Phase I relocation and a subsequent quick transition to Phase II would undercut the principal rationale for a two-phase transition – that the potential to leave substantial amounts of spectrum unused for a long period of time would result in inefficient use of valuable 2 GHz spectrum. *See MSS Second R&O,* 15 FCC Rcd at 12327, ¶ 34 (stating that a phased approach will "assur[e] efficient use of the spectrum."). In addition, the Commission reasoned that if Phase II of the transition was initiated during the time in which Phase I relocations are taking place, BAS operations could be on three different band plans, and some BAS licensees would face the disruption and down time associated with being twice relocated in a short period of time. *MSS Third R&O,* 18 FCC Rcd at 23655, ¶ 33.

[121]*MSS Second R&O,* 15 FCC Rcd at 12328-31, ¶¶ 38-49. *See generally,* 47 C.F.R. § 101.73 (good faith negotiation requirement).

[122]For purposes of the relocation plan, BAS markets consist of Nielsen Designated Market Areas (DMAs) as they existed on June 27, 2000. *See MSS Second R&O,* 15 FCC Rcd at 12331, ¶ 42.

[123]*MSS Second R&O,* 15 FCC Rcd at 12331, ¶ 48. *See generally,* 47 C.F.R. § 101.75. Under involuntary relocation, the new MSS entrant may, at its own expense, make necessary modifications to or replace the incumbent licensee's BAS equipment such that the BAS licensee receives comparable performance from the modifications or replaced equipment. The current mandatory negotiation periods adopted in the *MSS Third R&O* are as follows: MSS licensees and BAS incumbents in markets 1-30 and all BAS fixed stations, regardless of market size, begin a mandatory negotiation period that lasts for one year from December 8, 2003. *See MSS Third R&O,* 18 FCC Rcd at 23659-60, ¶ 42. The Commission also provided for a sunset date, December 8, 2013, after which a new licensee's obligation to relocate an incumbent BAS operator in the 1990-2025 MHz band will end. At that time, BAS operations in the band (if any remain) will operate on a secondary basis. *See MSS Third R&O,* 18 FCC Rcd 23661-62, ¶¶ 45-47.

[124]This requirement was subsequently modified on reconsideration. *800 MHz R&O* at ¶ 260. *See also* ¶ 64 *infra.*

[125]*MSS Third R&O,* 18 FCC Rcd at 23657, ¶ 38.

Nextel's obligations, as a new entrant, to relocate incumbent BAS systems in the 1990-1995 MHz band.[126] Specifically, the Commission, as a condition on Nextel's 1.9 GHz licenses, required Nextel to follow a relocation procedure based on a joint relocation plan submitted by MSTV, NAB, and Nextel and relocate all BAS licensees in the 1990-2025 MHz band to comparable facilities within thirty months after the effective date of the *800 MHz R&O.*[127]

61. The mandatory negotiation periods for Nextel and BAS licensees end on May 31, 2005 for stage-one relocations (stage-one ends eighteen months after the effective date of the *800 MHz R&O*) and on March 31, 2006 for stage-two relocations (stage-two ends thirty months after the effective date of the *800 MHz R&O*).[128] The Commission stated that MSS licensees may voluntarily join in these negotiations in order to relocate BAS operations in markets 31 and above and any fixed BAS operations, regardless of market size. We encouraged MSS licensees to work cooperatively with Nextel in these negotiations because all parties would collectively benefit from the expeditious relocation of BAS incumbents to the new band plan.[129]

62. Under the *800 MHz R&O,* Nextel is entitled to seek *pro rata* reimbursement of eligible clearing costs incurred during the 36-month 800 MHz band reconfiguration period from MSS licensees that enter the band prior to the end of that period.[130] Nextel would pay all upfront costs and receive credit for BAS relocation in the 800 MHz true-up process, less any MSS-reimbursed expenses.[131] Thus, Nextel would no longer be entitled to reimbursement from other entrants to the band after receiving credit for its relocation costs at the 800 MHz true-up.[132] Further, Nextel's right to seek reimbursement from any MSS entrants entering before the end of the 36-month reconfiguration period would be limited to costs Nextel incurred for clearing the top 30 markets and relocating all fixed BAS facilities, regardless of market size, and to an MSS licensee's *pro rata* share of the 1990-2025 MHz spectrum.[133] The Commission believed that limiting the amount of Nextel's reimbursement in this manner struck an

[126] *800 MHz R&O* at ¶¶ 251-263.

[127] *800 MHz R&O* at ¶ 252.

[128] *800 MHz R&O* at ¶ 258.

[129] *800 MHz R&O* at ¶ 258. We also noted that we would entertain requests filed by MSS licensees requesting that their voluntary participation in the negotiations between Nextel and BAS incumbents initiate their mandatory negotiation period. *Id.*

[130] Nextel is required to complete the 800 MHz band configuration process specified in the *800 MHz R&O* within thirty-six months of release of a Public Notice announcing the start date of reconfiguration in the first NPSPAC region. *800 MHz R&O* at ¶ 201.

[131] The Commission determined that Nextel's financial reconciliation ("800 MHz true-up" or "800 MHz true-up process") must occur no later than six months after the conclusion of the thirty-six month 800 MHz band reconfiguration process. *800 MHz R&O* at ¶ 330.

[132] *800 MHz R&O* at ¶¶ 261, 304.

[133] *800 MHz R&O* at ¶ 261. Nextel is also required to inform the Commission and MSS licensees on whether it will or will not be seeking reimbursement from MSS licensees 12 months after the effective date of the *800 MHz R&O. Id.*

appropriate balance that was not unreasonably burdensome on Nextel or MSS licensees.[134]

63. Similarly, Nextel is also obligated to reimburse MSS licensees for Nextel's *pro rata* share of the MSS licensees' relocation expenses, should the MSS licensee trigger involuntary relocation or otherwise participate in the relocation process before Nextel has completed its nationwide clearing of the band. Any reimbursement by Nextel to MSS licensees would have to occur before the 800 MHz true-up period ends, so that these reimbursement expenses can be accounted for at the 800 MHz true-up. Both Nextel and MSS licensees under the MSS plan must clear the entire 1990-2025 band (a total of thirty-five megahertz of spectrum) while only operating in 1990-1995 MHz (a total of five megahertz of spectrum) and in 2000-2020 MHz (a total of twenty megahertz of spectrum), respectively. Therefore, Nextel's *pro rata* share represents the costs to relocate one-seventh of the spectrum.[135]

64. *MSS-BAS Relocation Plan.* In the *800 MHz R&O,* the Commission also decided not to alter the underlying relocation rules that were established for MSS entrants in the *MSS Third R&O* except to modify, on reconsideration, one aspect of the existing MSS plan to relocate BAS incumbents to complement Nextel's plan for entry into the band and to address BAS relocation issues raised in the petitions for reconsideration of the *MSS Third R&O.* On reconsideration, the Commission decided to no longer require BAS licensees in TV markets 31-210 to cease operations on channels 1 and 2 (1990-2008 MHz and 2008-2025 MHz, respectively) until they have been relocated to the new band plan at 2025-2110 MHz. The Commission found that this modification was appropriate to accommodate Nextel's entry into the band under the adopted Nextel-BAS plan, which did not require BAS incumbents in markets 31 and above to cease operations on these two channels without receiving compensation prior to vacating the spectrum.[136]

65. Under the *800 MHz R&O,* MSS licensees would retain the option of accelerating the clearing of those markets so that they could begin operations before Nextel has completed nationwide clearing. We recognized that the parties would have to work cooperatively to ensure a smooth transition for BAS incumbents and to facilitate that process, we required Nextel to file with the Commission and copy the MSS licensees, within thirty days after the effective date of the *800 MHz R&O,* its plan for the relocation of BAS operations in the markets that will be relocated during stage one (*i.e.*, within eighteen months).[137] MSS licensees would have thirty days to review the Nextel plan and identify to Nextel and the Commission which of the top thirty TV markets and fixed BAS operations, if any, they intend to invoke involuntary relocation.[138] If MSS licensees chose not to trigger involuntary relocation, Nextel would proceed under its plan to relocate BAS incumbents. The Commission found that the best way to ensure the continuity of BAS – a critical part of the broadcasting system by which emergency information and entertainment content is provided to the American public – during the transition was to retain the existing

[134]Under the MSS plan, MSS licensees are required to clear the top 30 BAS markets and all fixed BAS stations, regardless of market size, before beginning operations. The accounting among MSS licensees to settle relocation expenditures would not occur until after the end of the MSS relocation process. *MSS Second R&O*, 15 FCC Rcd at 12338 ¶ 68.

[135]*800 MHz R&O* at ¶ 262.

[136]*800 MHz R&O* at ¶ 269.

[137]*800 MHz R&O* at ¶ 257.

[138]The one-year mandatory negotiation period for MSS and BAS licensees in markets 1-30 and all BAS fixed stations, regardless of market size, is already in effect and lasts until December 8, 2004. After this date, any MSS entrant may involuntarily relocate incumbent BAS operations.

MSS relocation rules but also to overlay procedures by which Nextel may relocate BAS incumbents. Therefore, we noted that we expect Nextel and MSS licensees to work together to minimize the disruption BAS licensees will experience in the transition.[139]

66. *Discussion.* In the *MSS Third R&O*, we noted that with the redesignation of the 1990-2000 MHz and 2020-2025 MHz bands in the AWS proceeding, non-MSS licensees that may begin service later will benefit from the band clearing paid for by MSS licensees. We therefore stated that we will provide an equitable mechanism by which MSS licensees can recover some of the relocation costs incurred from other licensees who will benefit from the band clearing of incumbent BAS operations from the 1990-2025 MHz band. However, we deferred setting forth comprehensive procedures that new Fixed and Mobile service providers (including AWS entrants) in these bands must follow to reimburse MSS licensees that will have incurred relocation costs.[140] Now that the existing BAS relocation and cost sharing obligations for Nextel and MSS licensees in the 1990-2025 MHz band have been decided and are summarized above, we discuss how these relocation procedures would apply to new AWS entrants in the 1995-2000 MHz and 2020-2025 MHz bands.

67. As discussed above, under the *800 MHz R&O*, Nextel is obligated to complete the relocation of all BAS incumbents by May 2007.[141] Under the MSS plan, MSS licensees may begin operations once the top thirty BAS markets and all fixed BAS stations, regardless of market size, have been cleared[142] and must certify that their systems are operational by no later than July 2007.[143]

68. We first conclude that AWS licensees that do not begin operations in the 1990-2025 MHz band until after this spectrum has been cleared will not have to participate in the relocation process of incumbent BAS licensees. These AWS licensees will receive unencumbered spectrum, the value of which will be reflected in the auction price. Further, these late-entering AWS licensees will not have any reimbursement obligation to Nextel, if Nextel has received credit for BAS relocation costs in the 800 MHz true-up. These AWS licensees may, under certain circumstances, have reimbursement obligations to MSS entrants, as discussed below; otherwise, these AWS licensees would not have a reimbursement obligation to MSS entrants.[144]

69. We will require an AWS licensee that enters the band prior to the milestones established for Nextel and MSS licensees to participate in the BAS relocation process as discussed below. AWS

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[139] *800 MHz R&O* at ¶ 250.

[140] *MSS Third R&O,* 18 FCC Rcd at 23644 ¶ 10.

[141] As noted earlier, Nextel is required to complete its nationwide relocation of BAS operations within 30 months after the effective date of the *800 MHz R&O. See* ¶ 60 *supra.*

[142] Under the MSS plan, MSS licensees may invoke involuntary relocation of BAS operations in the top 30 TV markets and fixed BAS stations, regardless of market size, after December 8, 2004. As we stated earlier, MSS licensees would have an opportunity to coordinate with Nextel on which top 30 BAS markets and fixed BAS stations the MSS licensees plan to invoke involuntary relocation. *See* ¶ 65 *supra.*

[143] This deadline applies to all 2 GHz MSS licensees except TMI. TMI must certify that its system is fully operational by November 2008. *See* TMI Communications and Company, Limited Partnership and TerreStar Networks, Inc. Application for Review and Request for Stay, *Memorandum Opinion and Order*, 19 FCC Rcd 12603 (2004).

[144] *See* ¶¶ 69-73 *infra. See generally*, section III(C) ("Band Clearance and Reimbursement") in the *AWS 2 GHz Service Rules NPRM*, FCC No. 04-218.

licensees shall generally follow a relocation plan modeled on the policies set forth in our earlier *Emerging Technologies* proceeding and, in particular, follow the requirement that new entrants provide comparable facilities to incumbents that are relocated.[145] Accordingly, AWS licensees must provide comparable facilities to BAS incumbents that are relocated.[146] Further, AWS licensees, Nextel and MSS licensees, each of which individually is authorized to operate on a fraction of the band, will mutually benefit from the clearance of all BAS licensees in the band.[147] An AWS licensee will be responsible, similar to other new entrants, to relocate all BAS operations from 1990-2025 MHz, even if it ultimately does not build its own facilities in some geographic areas. As we determined in the *MSS Third R&O* and affirmed in the *800 MHz R&O*, a one-phase relocation plan avoids the possibility of BAS operations on three different band plans, and eliminates the potential disruption and down time to BAS associated with being relocated under two different phases in a short period of time.[148] We also note that our decision to accommodate AWS entrants into the band does not alter our need to minimize the disruption to incumbent BAS operations during the transition. Therefore, we believe that, in the event BAS relocation has not been completed, including AWS licensees as participants in the relocation of all BAS operations from the 1990-2025 MHz band strikes an appropriate balance that is not unduly burdensome on AWS entrants, while also fair to the BAS incumbents and the other entrants in the band.

70. An AWS licensee, like Nextel, uses a terrestrial network and has a different interference potential between its service and BAS than that of MSS and BAS. Unlike satellites, whose signals can blanket the whole country simultaneously, a terrestrial network is limited to discrete geographic areas served by multiple base stations. Thus, the terrestrial nature of an AWS licensee's service allows for the gradual relocation of incumbents during a geographically-based build-out period. In the *800 MHz R&O*, we allowed Nextel to determine its own schedule for relocating incumbent BAS facilities in a TV market as follows: Nextel must relocate incumbent BAS licensees before beginning operation in a particular BAS market, but Nextel may determine the markets it wishes to serve. Thus, whereas we had established a relocation process based on specific markets (1-30, 31-100, and 101-210) for MSS, Nextel's operations would only affect those markets where it chooses to deploy its service. We therefore required Nextel to relocate incumbent BAS operations in every BAS market it wished to serve, regardless of market size, prior to commencing operations and within a thirty-month timeframe. We concluded that the differences between the terrestrial nature of the Nextel's service and the ubiquitous service that will be provided by MSS warranted these distinctions in the relocation procedures.[149] Similarly, we will now require an AWS licensee to relocate incumbent BAS licensees before beginning operations in every BAS market it wishes to serve.

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[145] *See also 800 MHz R&O* at ¶ 252; *MSS Third R&O*, 18 FCC Rcd 23638.

[146] *See* 47 C.F.R. §§§ 74.690, 78.40, 101.73.

[147] AWS licensees are now authorized to operate in the 1995-2000 MHz and 2020-2025 MHz bands. *See* ¶¶ 41 and 46 *supra*. Nextel is authorized to operate in the 1990-1995 MHz band. *See 800 MHz R&O* ET Docket No. 95-18, released August 6, 2004. Each authorized 2 GHz MSS licensee receives an equal share of the available frequencies in which its primary service operations will take place, to be chosen at the time it has launched one satellite into its intended orbit. Each authorized 2 GHz MSS system may also operate at other frequencies in the 2 GHz MSS band, provided it does not cause harmful interference to other assigned satellite networks or incumbent terrestrial services that have not been relocated. *See* In The Matter Of The Establishment Of Policies And Service Rules For The Mobile Satellite Service In The 2 GHz Band, IB Docket 99-81, *Report and Order*, 15 FCC Rcd 16127, 16138-140 ¶¶ 16-21 (2000).

[148] *MSS Third R&O*, 18 FCC Rcd at 23654-57 ¶¶ 32-35; *800 MHz R&O* at 252.

[149] *800 MHz R&O* at ¶ 255.

71. Further, the integrated nature of BAS operations makes isolated, link-by-link relocation infeasible. Therefore, as a practical matter, we note that it may be necessary for the AWS licensee to relocate more BAS facilities than an interference analysis might indicate as technically necessary in order to meet the comparable facility requirement for relocating BAS operations.[150] We also recognize that the AWS licensee is likely to deploy its service in some locations in a manner that does not correspond to the geography of the BAS market areas, and note that the AWS licensee will be obligated to relocate all incumbent BAS operations in all affected BAS markets, including those markets where the AWS licensee provides partial, minimal, or no service.[151]

72. We also decide to generally follow the cost-sharing principle that the licensees that ultimately benefit from the spectrum cleared by the first entrant shall bear the cost of reimbursing the first entrant for the accrual of that benefit, except as discussed below. Therefore, the first entrant may seek reimbursement from subsequently entering licensees for a proportional share of the first entrant's costs in clearing BAS spectrum, on a *pro rata* basis according to the amount of spectrum each licensee is assigned. Should it choose to, Nextel, as the first entrant, is entitled to seek *pro rata* reimbursement of eligible clearing costs incurred during its 36-month 800 MHz reconfiguration period from AWS licensees that enter the band prior to the end of that period.[152] As we determined in the *800 MHz R&O,* Nextel is not entitled to reimbursement from other entrants – which in this case are AWS entrants – to the band after receiving credit for its relocation costs at the 800 MHz true-up.[153] Further, Nextel's right to seek reimbursement from any AWS entrants entering before the end of the 36-month 800 MHz reconfiguration period will be limited to an AWS licensee's *pro rata* share of the 1990-2025 MHz spectrum.[154] Similarly, an AWS licensee will also be obligated to reimburse MSS licensees for the AWS licensee's *pro rata* share of the MSS licensees' relocation expenses, should the MSS licensee trigger involuntary relocation or otherwise participate in the relocation process before Nextel has completed its nationwide clearing of the band.[155]

73. All entrants must clear the entire 1990-2025 MHz band (a total of thirty-five megahertz of spectrum) while only operating in 1990-1995 MHz (a total of five megahertz of spectrum for Nextel), in 2000-2020 MHz (a total of twenty megahertz of spectrum for MSS), and in 1995-2000 MHz and 2020-2025 MHz (a total of ten megahertz of spectrum for AWS). Therefore, the *pro rata* share for AWS licensees, collectively, represents the costs to relocate two-sevenths of the spectrum (one-seventh for each five megahertz block). In the accompanying *AWS 2 GHz Services Rules NPRM,* we seek comment on issues related to the specific relocation and cost sharing obligations (*e.g.*, the actual apportionment of relocation costs among the various entrants, negotiation periods, etc.) of new AWS licensees entering the 1995-2000 MHz and 2020-2025 MHz bands prior to the completion of the nationwide band clearing by Nextel and/or MSS licensees.

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[150] *See* 47 C.F.R. §§ 74.690(d) and 78.40(d-e). For example, a BAS licensee's operations in an adjacent market may need to be relocated even though an AWS licensee does not initiate operations in that adjacent market.

[151] *See also 800 MHz R&O* at ¶ 256 (requiring Nextel to follow its agreement to relocate BAS licensees across multiple TV markets to avoid inter-market coordination and interference problems).

[152] *See* note 132 *supra.*

[153] *Id.*

[154] *See generally*, section III(C) ("Band Clearance and Reimbursement") in the *AWS 2 GHz Service Rules NPRM,* FCC No. 04-218.

[155] *Id.*

iii. Relocation in the 2175-2180 MHz Band

74. The 2175-2180 MHz sub-band is within the larger 2165-2200 MHz band that was previously allocated in ET Docket No. 95-18 from FS to MSS. As noted above, incumbent operations in this band include legacy Fixed and Mobile services. When the Commission allocated this band for MSS, it decided that the principles of the *Emerging Technologies* proceeding codified in Part 101 of our rules would apply, but in a slightly modified form.[156] For example, the Commission decided that relocation of incumbent FS licensees by new MSS licensees would be subject only to a mandatory negotiation period. Furthermore, in light of various factors that related specifically to MSS roll-out, including MSS milestone considerations and the potential for ATC offerings by MSS, the Commission also decided to shorten the length of the mandatory negotiation period and specify its starting date with the publication of the *MSS Third R&O and Third MO&O* in the Federal Register. As part of the *AWS Further Notice*, the Commission also asked how these relocation principles would apply to new AWS entrants into the portion of the band that had been reallocated from MSS to the Fixed and Mobile services in order to support new AWS applications.[157] Although our recent actions have focused primarily on the complex issues related to the portion of the MSS allocation that is currently occupied by incumbent BAS licensees, we note that the record that has been developed in this proceeding and the rules that are currently in effect support application of the *Emerging Technologies* relocation procedures to the 2175-2180 MHz band.

75. Subsequently, in the *AWS Second R&O*, we addressed the relocation procedures that would apply to new AWS entrants in the 2110-2150 MHz band that sought to relocate the incumbent FS licensees in that band.[158] We concluded that "the modified relocation procedures . . . represent[ed] the best course."[159] We reasoned that "[a] unified approach to our rules and procedures serves the public interest, and can promote the rapid development of AWS, which many commenters support."[160]

76. Given our decision in the *AWS Second R&O* to apply the modified procedures to AWS licensee relocation of FS in the 2110-2150 MHz band, we conclude that it is appropriate to apply the same procedures to the relocation of FS by AWS licensees in the 2175-2180 MHz band. Specifically, sections 101.69 through 101.82 of the rules set forth the provisions governing the transition from FS to ET services, including both the more generic ET relocation procedures for PCS and AWS and the MSS modifications. For example, these rules set forth, among other matters, provisions regarding voluntary and mandatory periods, sunset provisions, involuntary relocation procedures, and the allocation of reimbursement expenses by subsequently entering ET licensees. By making the modified MSS provisions applicable in the 2175-2180 MHz band, new AWS entrants will be governed by the same relocation rules that apply to AWS entrants in the other bands subject to Part 101 relocation. In short, we believe that relocation procedures for AWS in the 2175-2180 MHz band that are consistent with the relocation procedures discussed in this and related proceedings will foster a more efficient roll-out of AWS, will minimize confusion among the parties, and will thereby serve the public interest.

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[156] *See MSS Second R&O.* These procedures were further modified in the *MSS Third R&O. See also* 47 C.F.R. §§ 101.69-101.82.

[157] *AWS Further Notice*, 16 FCC Rcd 16043 at ¶ 34.

[158] *AWS Second R&O*, 17 FCC Rcd at 23214-15, ¶¶ 42-46.

[159] *AWS Second R&O*, 17 FCC Rcd at 23215, ¶ 46.

[160] *Id.*

D. Additional Flexibility in the 1920-1930 MHz Band

77. As noted earlier above, several commenters requested that we modify the 1915-1930 MHz UPCS band. In general, commenters either requested that we extend the isochronous UPCS band from 1920-1930 MHz to include the 1915-1920 MHz band or that we modify the rules for 1920-1930 MHz band to allow additional devices to access the band. As an initial matter, we note that this *Sixth R&O* redesignates the 1915-1920 MHz band for AWS. In doing so, we decline to extend the isochronous UPCS band down to 1915 MHz. However, this action does not preclude the consideration of additional flexibility in the remaining UPCS band at 1920-1930 MHz. Specifically, the DECT Forum requests that we modify the Part 15 rules to remove the specific channels, to expand the maximum channel bandwidth from 1.25 megahertz to 2.5 megahertz, and to remove the requirement to follow a specific algorithm for searching for an open channel (*i.e.*, the packing rule).[161] Ericsson, Siemens, and Inventel also state that the UPCS band would be more useful if certain changes are made to the isochronous UPCS rules.[162]

78. VTech and UTStarcom disagree with requests to change the Part 15 rules to allow for more flexible unlicensed use in the 1920-1930 MHz band. Specifically, VTech contends that changing the Part 15 rules consistent with the request of DECT Forum would negatively impact current unlicensed voice systems by decreasing channel availability.[163]

79. Several factors must be weighed when considering whether to modify the rules for the 1920-1930 MHz UPCS band. We must look at the potential benefits consumers would reap should additional flexibility be granted and we must similarly examine the potential for such flexibility to negatively impact existing systems. In this regard, we note that the existing UPCS rules have been in place since 1993 and in the intervening eleven years there has only been limited use of the UPCS band. In addition, our experience has been that when provided with flexibility manufacturers will innovate and produce products that the market will support. Therefore, we agree with DECT Forum and are modifying the rules for UPCS in the 1920-1930 MHz band to provide additional flexibility for the use of other types of voice based systems. Specifically, we will remove the requirement to use specified channels, allow devices to transmit with a maximum bandwidth of 2.5 megahertz, and we will delete the packing rule. In addition, we will allow asynchronous operation in this band. We believe that these changes will promote the introduction of spectrally efficient equipment that will be widely supported by the public.

80. We recognize that by changing the current rules we may impact existing wireless PBX systems.[164] The use of wider channels by a new system located near an existing system could preclude the use of some channels by a wireless PBX system. Further, the wider channels could partially overlap

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[161] *See ex parte* of DECT Forum filed December 12, 2003. Currently, Section 15.323(a) fixes channels at 1.25 megahertz and Section 15.323(b) requires that emissions with a bandwidth less than 625 kHz shall start searching for an available time and spectrum window three megahertz away from the band edge at 1920 MHz and search upwards from that point, while emissions with a bandwidth greater than 625 kHz shall start searching for an available time and spectrum window three megahertz from the band edge at 1930 MHz and search downward from that point.

[162] Ericsson Comments to *AWS Third NPRM* at 6; Siemens Comments to *AWS Third NPRM* at 4-5; Inventel Reply Comments to AWS Third NPRM at 2-3.

[163] *See ex parte* of VTech Holdings filed April 13, 2004; *see also* UTStarcom Comments to *AWS Third NPRM* at 3 (stating that the UPCS band is not suitable for community wireless systems).

[164] *See, e.g.,* UTStarcom Comments to *AWS Third NPRM* at 3 (noting that community wireless systems may interfere with existing wireless PBX equipment).

existing channels and cause interference. We believe, however, that because these devices all operate at relatively low power, they would need to be in close proximity of each other to cause interference. Therefore, we believe that the probability of interference occurring is low. In addition, we note that wireless PBX systems can also take advantage of the additional flexibility by using wider channels and thus increasing the data rate. The ability to have higher throughputs should ameliorate some of the concerns of the potential for fewer available channels as high order modulation techniques and coding can be used to attain a better than one for one channel replacement (*i.e.*, the throughput on one 2.5 megahertz channel may be greater than the throughput of two separate 1.25 megahertz channels).

81. In sum, we believe that the potential benefits of additional flexibility outweigh the potential consequences that wireless PBX systems may experience. Allowing greater flexibility in the 1920-1930 MHz band will provide an opportunity for unlicensed use to expand and maximize the use of this spectrum. For the reasons provided, we are modifying Part 15 as specified above.[165]

V. THIRD MEMORANDUM OPINION AND ORDER IN ET DOCKET NO. 00-258

A. Petitions for Reconsideration to *AWS Second Report and Order*

82. In the AWS *Second R&O* in ET Docket No. 00-258, the Commission allocated ninety megahertz of spectrum from Federal Government and non-Federal Government operations at 1710-1755 MHz and 2110-2155 MHz to be used to support AWS.[166] In response to this decision, there were four Petitions for Reconsideration filings by Sirius and XM, jointly, Sprint, WCA, and PCIA.[167]

83. On February 24, 2003, Sirius and XM filed a joint petition for reconsideration regarding the reallocation of the 1710-1755 MHz and 2110-2155 MHz bands, in which they claim that the Commission reallocated the bands without addressing their comments regarding potential interference if incumbent Federal Government users were relocated to the 2360-2395 MHz band.[168] They ask us to consider their comments "either on reconsideration of the *Second Report and Order* or in the future proceeding the Commission has stated it will initiate."[169] In the *AWS Fourth NPRM*, adopted June 13, 2003, we made proposals pertaining to the relocation of incumbent Federal Government users in the AWS bands and specifically discussed Sirius and XM's comments.[170] Because we have already satisfied their request, we deny the Sirius/XM Petition.

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[165] *See* Appendix A.

[166] *See AWS Second R&O*, 17 FCC Rcd at 23203-23216.

[167] *See* Sirius Satellite Radio Inc. and XM Radio Inc., Petition for Reconsideration to *AWS Second R&O* (filed August 8, 2002) ("Sirius and XM Petition"); Sprint, Petition for Reconsideration to *AWS Second R&O* (filed February 24, 2003) ("Sprint Petition"); WCA, Petition for Reconsideration to *AWS Second R&O* (filed February 24, 2003) ("WCA Petition"); PCIA, Petition for Reconsideration to *AWS Second R&O* (filed February 24, 2003) ("PCIA Petition").

[168] Joint Petition for Reconsideration of Sirius Satellite Radio, Inc., and XM Radio Inc. ("Sirius/XM Petition") In the their petition, Sirius and XM attach a copy of the comments they filed August 8, 2002, in response to the *2002 NTIA Viability Assessment* (which addressed potential relocation bands for Federal Government incumbent users and to which the Commission sought comment).

[169] Sirius/XM Petition at 4.

[170] *AWS Fourth NPRM*, 18 FCC Rcd at 13259-60, para. 50.

84. Also, Sprint and WCA each filed a petition for reconsideration that challenged the Commission's decision to reallocate the 2150-2162 MHz band from MDS without both identifying comparable replacement spectrum and full compensation for their relocation costs.[171] More specifically, in its comments Sprint states that the Commission did not consider all of the comments, concerns, and proposals submitted before making a decision to reallocate spectrum from MDS to AWS use.[172] Also, WCA states that taking away previously auctioned spectrum without replacement spectrum and reimbursement for relocation costs undermines the auction process.[173]

85. On May 14, 2003 AT&T Wireless and Verizon Wireless filed a joint Opposition to the Petitions for Reconsideration of Sprint and WCA.[174] AT&T and Verizon agree that MDS should be given comparable replacement spectrum and reimbursement for relocation costs, but should avoid decisions that are not in the public interest.[175] It states that the most logical place to relocate MDS is to the 2500-2690 MHz band. Here, displaced MDS licensees can provide traditional wireless cable services, two-way services, expand operations and meet additional spectrum needs easily, and exploit economies of scale in equipment development.[176]

86. Although the Commission did not adopt the MDS Industry Compromise as a mechanism to resolve MDS relocation costs and replacement spectrum, the Commission decided to relocate displaced MDS licensees from the 2150-2162 MHz band to the 2.5 GHz band as part of the *2.5 GHz MDS Restructuring R&O*.[177] Specifically, this item makes available twelve megahertz of comparable spectrum to the displaced 2.1 GHz MDS users, providing full compensation for the amount of spectrum previously designated for AWS use. For these reasons, we deny the Sprint Petition for Reconsideration and the WCA Petition for Reconsideration as moot since the issues raised no longer apply and have been dealt with in a separate proceeding.

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[171] Sprint Petition; WCA Petition. *See also*, Sprint, Reply to Opposition by AT&T and Verizon (filed May 30, 2003) ("Sprint Reply to Opposition"); WCA, Reply to Opposition by AT&T and Verizon (filed May 29, 2003) ("WCA Reply to Opposition") (Sprint and WCA filed similar comments as those found in their Petition for Reconsiderations. In addition to previous comments, Sprint and WCA pointed out that MDS replacement spectrum must be able to accommodate TDD technology.)

[172] Sprint Petition at 3.

[173] WCA Petition at 16-17.

[174] *See* AT&T Wireless and Verizon Wireless, Joint Opposition to Sprint and WCA Petitions for Reconsideration (filed May 14, 2003) ("AT&T and Verizon Opposition").

[175] AT&T and Verizon Opposition at 6.

[176] AT&T and Verizon Opposition at 4-6.

[177] Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, WT Docket No. 03-66, RM-10586, Part 1 of the Commission's Rules – Further Competitive Bidding Procedures, WT Docket No. 03-67, Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and the Instructional Television Fixed Service Amendment of Parts 21 and 74 to Engage in Fixed Two-Way Transmissions, MM Docket No. 97-217, Amendment of Part 21 and 74 of the Commission's Rules With Regard to Licensing in the Multipoint distribution Service in the Instructional Television Fixed Service for the Gulf of Mexico, WT Docket No. 02-68, RM-9718, Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, WT Docket No. 00-230, *Report and Order and Further Notice of Proposed Rulemaking*, (released July 29, 2004) (*"2.5 GHz MDS Restructuring R&O and NPRM"*).

87. PCIA-The Wireless Infrastructure Association, filed a Petition for Partial Reconsideration to the allocation decision we adopted in the *AWS Second R&O* on February 24, 2003, regarding the issue of how new licensees are to share with each other the cost of relocation of incumbent licensees in the 2110-2150 MHz band. It proposed that Section 101.99(a) of the Commission's Rules be modified so as to establish a band-clearing cost-sharing clearinghouse for the 2110-2150 MHz band. PCIA made the same request in comments it filed in response to the Notice of Proposed Rulemaking in WT Docket No. 02-353.[178] We first addressed this issue in conjunction with the service rules we adopted for the 1710-1755 MHz and 2110-2155 MHz bands and now seek comment on the cost sharing matters that are the subject of PCIA's petition in the *AWS 2 GHz Service Rules NPRM*. We therefore dismiss PCIA's petition because we will fully consider these issues in that rulemaking proceeding.

B. Petitions for Reconsideration to *AWS Third Report and Order*

88. In the *AWS Third R&O*, the Commission reallocated the MSS 1990-2000/2020-2025 MHz and 2165-2180 MHz bands for Fixed and Mobile services. In response to this reallocation decision, five Petitions for Reconsideration were filed by Celsat, CTIA, ICO, Satellite Industry Association (SIA), and TMI Communications and Company and TerreStar Networks Inc. (TMI and TerreStar).[179]

89. Several satellite entities filed Petitions for Reconsideration against the reallocation of MSS spectrum for other services. ICO questions the rationale behind the Commission's decision to reallocate thirty megahertz of MSS spectrum, including all but ten megahertz of the globally allocated uplink spectrum. ICO provides several reasons it believes the MSS spectrum, or portions of, should not have been reallocated. First it states that the decision did not consider the public interest nor the short amount of time MSS licensees had access to spectrum to build out networks.[180] Furthermore, ICO believes that the Commission should not have reallocated globally harmonized spectrum, particularly the 1990-2000 MHz segment. ICO notes that this change will cause problems to its MSS operations, having already chosen its Selected Assignment in this band segment for its operations.[181]

90. SIA also disagrees with the decision to reallocate MSS spectrum before MSS is given time to grow and develop, and states that the Commission has no justification for reallocating globally allocated satellite spectrum.[182] Recognizing that there are advantages to harmonized spectrum, SIA states that there are benefits for all communications services by globally harmonizing spectrum: reduction in equipment costs, encouragement of new innovation, and creation of new market opportunities.[183] SIA contends that by reallocating the globally harmonized MSS spectrum, the Commission is not supporting

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[178]PCIA Petition for Partial Reconsideration at 1, n3; Comments of PCIA in WT Docket No. 02-353 (filed Feb. 7, 2003).

[179]*See* Celsat, Petition for Reconsideration (filed April 14, 2003) ("Celsat Petition"); CTIA, Petition for Reconsideration (filed xxx) ("CTIA Petition"); ICO, Petition for Reconsideration (filed April 14, 2003) ("ICO Petition"); SIA, Petition for Reconsideration (filed April 14, 2003) ("SIA Petition"); TMI and TerreStar, Joint Petition for Reconsideration (filed April 14, 2003) ("TMI and TerreStar Petition").

[180]ICO Petition at 3-4.

[181]ICO Petition at 5-8.

[182]SIA Petition at 2.

[183]SIA Petition at 3-5.

its own policy to promote international spectrum allocations.[184] Finally, SIA states that the reasons provided for reallocation, including possible new uses, and concerns about interference to PCS disregard documented technical analysis and the public interest benefit of retaining the globally allocated 2 GHz MSS spectrum.[185]

91. The Petition for Reconsideration filed jointly by TMI and TerreStar raises some of the same issues as ICO and SIA. Similarly, it contends that there was not justification for taking away so much of the MSS spectrum, including the global spectrum, which will affect the development of this industry and the areas which it services.[186] TMI and TerreStar also state that the method in which MSS spectrum is distributed among MSS licensees should consider current authorizations waiting to be restored and should not be distributed until these pending authorizations are complete.[187] Additionally, TMI and TerreStar want to make sure that reallocating MSS spectrum for AWS will not affect the current 2 GHz MSS milestone review policies.[188]

92. In response to the petitions filed by ICO, SIA, and TMI and TerreStar (collectively, the "MSS Petitions"), Boeing and Globalstar supported SIA's petition, while CTIA and WCA, as well as AT&T, Verizon, and Cingular (jointly, the "Carriers"), filed against these three petitions.[189] Boeing and Globalstar generally support all arguments raised by SIA.[190] More specifically, GlobalStar asserts that there is a lack of technical evidence showing that the reason for reallocating global MSS spectrum was to avoid interference with the adjacent PCS band.[191] Filing an opposition to the MSS Petitions, the Carriers and CTIA state that there was more than adequate justification for reducing the amount of MSS spectrum, including licensees not meeting milestone obligations, unassigned spectrum being unused and growing demands for more CMRS spectrum.[192] The Carriers and CTIA also contend that it was shown in various contexts that both a guardband and emission limits were required to prevent interference to PCS operations, which provides sufficient reason to remove a portion of MSS globally harmonized

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[184]SIA Petition at 5-6.

[185]SIA Petition at 8-10.

[186]TMI and TerreStar Petition at 4-6.

[187]TMI and TerreStar Petition at 2.

[188]TMI and TerreStar Petition at 3-4.

[189]*See* Boeing, Comments to SIA Petition for Reconsideration (filed May 14, 2003) ("Boeing Comment"); Globalstar, Reply to Oppositions to Petition for Reconsideration filed by SIA (filed May 29, 2003) ("Globalstar Reply"); AT&T, Verizon, and Cingular, Comment to SIA Petition for Reconsideration (filed May 14, 2003) ("Carriers Comment"); CTIA Opposition to ICO, SIA, and TMI and TerreStar Petitions for Reconsideration (filed May 14, 2003) ("CTIA Opposition"); WCA Opposition to ICO, SIA, and TMI and TerreStar Petitions for Reconsideration (filed May 14, 2003). *See also*, ICO, Reply to Opposition and Comment to Petition for Reconsideration (filed May 27, 2003); SIA Reply to Opposition and Comment to Petition for Reconsideration (filed May 29, 2003).

[190]Boeing Comment at 7-8; Globalstar Reply at 2.

[191]Globalstar Reply at 3-6.

[192]Carriers Comment at 9-11; CTIA Opposition at 2-5.

spectrum.[193]

93. In addition to opposing the Petitions filed by the satellite entities, CTIA filed a Petition for Reconsideration regarding reallocation of all unassigned spectrum, or spectrum from licensees that miss their 2 GHz milestones, to services other than MSS.[194] CTIA states that instead of giving MSS more spectrum than their business plans support, the remaining spectrum, after providing each MSS licensee with seven megahertz of spectrum, should be reallocated. More specifically, CTIA claims that there was no rationale for retaining forty megahertz of spectrum for MSS even with authorization of ATC operations.[195] It states that ATC cannot be an economic driver in the success of MSS and does not provide a public interest reason for an increase in MSS spectrum given that one of the benefits of ATC is that it does not require additional spectrum.[196]

94. AT&T Wireless, Verizon Wireless, and Cingular Wireless (jointly, the "Carriers") filed a joint response that supported CTIA's petition.[197] The Carriers find the decision to grant each MSS licensee more than seven megahertz of spectrum peculiar, given the fact that in the *MSS Service Rules Order* the Commission found that seven megahertz was sufficient for MSS to commence service.[198] The Carriers contend that MSS licensees should be held to meeting their milestones with their current seven megahertz of spectrum before being given additional spectrum for expected long-term growth and needs.[199] Additionally, the Carriers question whether more spectrum is needed provided that ATC was authorized for use in 2 GHz MSS systems in the *MSS ATC R&O*,[200] in which it was stated that ATC improves more efficient use of spectrum by MSS licensees to provide more and better services with the same amount of spectrum.[201]

95. Boeing and ICO each filed an Opposition to CTIA's Petition for Reconsideration refuting the arguments raised regarding insufficient rationale for retaining forty megahertz of 2 GHz MSS spectrum.[202] First, Boeing and ICO state that the Commission considered the public interest when

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[193]Carriers Comment at 12-14; CTIA Opposition at 5-8.

[194]CTIA Petition at 2. See also, CTIA Reply to Oppositions to CTIA Petition (filed May 27, 2003) (provides similar comments as in its Petition for Reconsideration).

[195]CTIA Petition at 3-4.

[196]CTIA Petition at 4.

[197]*See* AT&T, Verizon, and Cingular, Joint Reply to CTIA Petition (filed May 14, 2003) ("Carriers Joint Reply").

[198]Carriers Joint Reply at 2-3. *See also*, Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band, *Report and Order*, 15 FCC Rcd 16127 (2000) (*"MSS Service Rules Order"*).

[199]Carriers Joint Reply at 3-4.

[200]*See* Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6-2.4 GHz Bands, IB Docket No. 01-185, Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6-2.4 GHz Bands, IB Docket No. 02-364, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd 1962 (2003) (*"MSS ATC R&O and NPRM"*).

[201]*MSS ATC R&O*, 18 FCC Rcd at 1973-1974, ¶ 20.

[202]Boeing, Opposition to CTIA Petition for Reconsideration (filed May 14, 2003) ("Boeing Opposition"); ICO, Opposition to CTIA Petition for Reconsideration (filed May 14, 2003) ("ICO Opposition").

making its decisions in the *MSS Service Rules Order* to authorize MSS. More specifically, the Commission participated in various international meetings to encourage globally harmonized spectrum for MSS and the record supported MSS to provide service in rural and underserved areas.[203] Furthermore, Boeing avers that since acquiring MSS spectrum, their need for more spectrum has increased, which has been provided through technical showings.[204] Based upon this requirement and others alike from MSS applicants it states that the decision to authorize a minimum amount of spectrum to MSS licensees and a mechanism in which to grow is fully supported by the record, showings of planned services, and the need to increase service to the public.[205]

96. We find that the Commission provided sufficient evidence and support from the public record to reallocate the 1990-2000 MHz, 2020-2025 MHz, and 2165-2180 MHz bands for AWS. In the *AWS Third Report and Order* of ET Docket 00-258 the Commission reallocated these bands for Fixed and Mobile services on a primary basis because there was a need to make more spectrum available for terrestrial wireless services to promote the introduction of new advanced services. Also, the Commission explained that the reallocation of this spectrum should not impair growth of MSS, especially since the decision was based upon unassigned and abandoned spectrum. The reallocation has not, we note, impaired the MSS milestone review. Further, we do not believe that the reallocation of some global MSS spectrum will impair the ability of the currently-authorized 2 GHz MSS systems to operate successfully. We note, for example, that the amount of globally harmonized spectrum available for the currently-authorized 2 GHz MSS systems should be sufficient, as four of the five currently-authorized 2 GHz MSS licensees plan to deploy geostationary orbit MSS networks providing regional service rather than non-geostationary orbit MSS networks providing global service. Therefore, we deny the petitions for reconsideration filed by CTIA, ICO, SIA, and TMI and TerreStar. We also agree with the MSS licensees that they should be given an opportunity to begin operations with the forty megahertz that remained after the 2 GHz MSS reallocation. The Commission also determined that it was in the public interest to permit the remaining forty megahertz of spectrum to be used by those MSS entities that are proceeding with plans to implement service in the 2 GHz MSS bands.[206] Because of this finding and our contemporaneous decision to permit MSS operators to provide ATC, MSS licensees will be able to introduce new services while using the spectrum more efficiently. We continue to believe that MSS use of this spectrum would serve the public interest.[207] Therefore, we deny CTIA's Petition for Reconsideration.

97. Finally, Celsat's Petition for Reconsideration asks the Commission to revisit the decision made in the *MSS Service Rules Order* to allow licensees to select any available spectrum in the upper and lower MSS bands to make up Selected Assignments. Celsat states that MSS licensees should instead be required to choose spectrum pairs with a uniform separation distance.[208] ICO, in its Opposition, supports the existing Independent Selection model, by which licensees are permitted to choose their own Selected

[203]Boeing Opposition at 2-3; ICO Opposition at 2-4. *See also, MSS ATC R&O*, 18 FCC Rcd at 1978; *MSS Service Rules Order*, 15 FCC Rcd at 31-39.

[204]Boeing Opposition at 4.

[205]Boeing Opposition at 4-5; *see also*, ICO Opposition at 4-6.

[206]*AWS Third R&O* at para. 29.

[207]*See Report and Order and Notice of Proposed Rulemaking*, IB Docket No. 01-185, FCC No. 04-134.

[208]Celsat Petition at 3.

Assignment from within the bands.[209] Because the *AWS Third R&O* took no action with respect to the existing Independent Selection rule that was previously adopted in the *MSS Service Rules Order* and that has become final, we deny Celsat's Petition as untimely.

VI. FIFTH MEMORANDUM OPINION AND ORDER IN ET DOCKET NO. 95-18

98. In the *MSS Third R&O and Third MO&O*, the Commission addressed, among other matters, the relocation of FS incumbents by MSS/ATC licensees in the 2180-2200 MHz band. Specifically, the Commission clarified that TIA TSB 10-F, or its successor, is an appropriate interference standard that may be used for determining interference from MSS/ATC stations to incumbent FS operations in the 2 GHz band; clarified that FS incumbents relocated through the negotiation process are eligible for reimbursement for relocation to leased facilities or alternative media, but declined to extend reimbursement eligibility to FS incumbents that voluntarily self-relocate; declined to establish separate "rolling" negotiation periods for each FS incumbent as they are approached by MSS licensees for relocation negotiation; amended the rules to specify that the time period for calculating the mandatory FS negotiation periods and the ten-year sunset period commence upon publication of this Report and Order in the Federal Register; clarified that an assignment or transfer of control does not disqualify a FS incumbent from relocation eligibility; and declined to require MSS licensees to relocate FS incumbents from which the MSS operation would only receive, but not cause, interference prior to the ten-year sunset date.[210]

99. In response, The American Petroleum Institute and the United Telecom Council (API/UTC) filed a joint petition for clarification and reconsideration concerning four aspects of the decisions pertaining to FS relocation.[211] First, API/UTC urge the Commission to clarify that a two-year mandatory negotiation period will apply with respect to relocation of non-public safety licensees by AWS licensees in the 2110-2150 MHz band. API/UTC further request that the Commission announce the onset of the mandatory negotiation period for AWS licensees in the 2110-2150 MHz band, as well as the onset of the ten-year "sunset" period, by Public Notice following the auction of spectrum in this band and the completion of the licensing process. With respect to the 2180-2200 MHz band, API/UTC request that the Commission reinstate the two-year mandatory negotiation period for non-public safety incumbent licensees in order to ensure that there will be an opportunity for meaningful negotiations. Finally, API/UTC urge the Commission to require relocation of paired FS links in the 2130-2150 MHz band whenever a new MSS licensee relocates incumbent FS operations in the 2180-2200 MHz band.

100. *AWS issues.* API/UTC state that certain amendments to sections 101.69 and 101.73 of our rules that the Commission adopted in the *MSS Third R&O and Third MO&O* result in gaps and uncertainties about the negotiation periods and sunset provisions for FS relocations from the 2110-2150 MHz band by AWS licensees.[212] Petitioners further state that these issues result from the deletion of references to the 2110-2150 MHz band that were codified in the previous versions of these two rule sections.

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[209] ICO Opposition to Celsat Petition at 2 (filed May 14, 2003). ICO also recognizes that the method of choosing frequency spectrum was decided in the *MSS Service Rules Order*, not the *AWS Third R&O*. *See also MSS Service Rules Order*.

[210] *See MSS Third R&O and Third MO&O* at ¶ 2.

[211] *See* Petition for Clarification and Reconsideration (filed January 7, 2004).

[212] *Id.* at 7.

101. Petitioners correctly surmise that references to the 2110-2150 MHz band were inadvertently omitted when the Part 101 rule sections were amended in *MSS Third R&O and Third MO&O*. Those amendments were not intended to modify the provisions established elsewhere in this and related proceedings that govern the relocation of FS incumbents in the 2110-2150 MHz band under circumstances where such relocation is triggered in the first instance by AWS licensees. Therefore, we amend the relevant sections in Part 101 to restore the previous references to the 2110-2150 MHz band and clarify that the modified FS relocation provisions (including the negotiation and sunset periods) adopted in the *MSS Third R&O and Third MO&O* apply to MSS/ATC licensees that initially trigger relocation of FS incumbents in the 2180-2200 MHz band. We also make other minor editorial changes in these sections to conform the range of frequencies specified to those recently allocated in this and other proceedings for the transition from FS to emerging technology, PCS, AWS, MSS/ATC and other related services.

102. We decline to adopt the API/UTC suggestion that the Commission should – in like manner to the MSS/ATC provisions adopted in the *MSS Third R&O and Third MO&O* – specify a date certain or, alternatively, announce by public notice the start of the mandatory negotiation and sunset periods for AWS-triggered FS relocations in the 2110-2150 MHz band. For FS relocation by AWS licensees under the current rules, mandatory negotiations will commence when the AWS licensee informs the fixed microwave licensee in writing of its desire to negotiate.[213] Petitioners argue that a date certain approach or, alternatively, a public notice approach, would provide greater certainty for all interested parties. We note, however, that this issue is beyond the scope of the *MSS Third R&O and Third MO&O* which addressed issues solely related to FS and BAS relocation by MSS/ATC licensees – but not by AWS licensees. Consequently, it is procedurally inappropriate for petitioners to raise this AWS-related issue here in a petition for reconsideration of the *MSS Third R&O and Third MO&O*. Beyond this procedural infirmity, we note that special circumstances, including the amount of time that has elapsed since adoption of the *MSS Second Report and Order*, as well as MSS milestone considerations, warranted the modifications to the MSS/ATC relocation/negotiation procedures, including the adoption of the date certain start of the FS/MSS negotiation periods, that were adopted in the *MSS Third R&O and Third MO&O*. As petitioners recognize, those special circumstances are not applicable to relocations by AWS licensees. While we do not disregard the beneficial intent stated by petitioners, we also do not believe that changes to the status quo are supported either by notice or by substantive comment in the current record.

103. *MSS/ATC issues*. API/UTC argue that the Commission should reconsider its decision to shorten the mandatory negotiation period between FS and MSS/ATC licensees in the 2180-2200 MHz band. Petitioners argue, in support, that the earliest milestone to launch a MSS satellite will not occur until January 2005 and that most MSS licensees need not launch until July 2006.[214] Petitioners further argue that MSS licensees need not choose the exact five megahertz of spectrum in which they will operate in the 2180-2200 MHz band until that time. By then, petitioners argue, the mandatory negotiation period will have expired. Consequently, it is contended, relocation will occur - if at all - through the involuntary negotiation process. At the same time, as noted above, petitioners acknowledge that special circumstances prevailed concerning the roll-out of MSS/ATC upon which the Commission relied in modifying the MSS/ATC negotiation periods in the 2180-2200 MHz band.[215]

[213] *See* 47 C.F.R. §101.73(d)

[214] *See* Petition for Clarification and Reconsideration (filed January 7, 2004) at 11.

[215] *Id.* at 9.

104. We decline to adopt two-year, and three-year, mandatory negotiation periods, respectively, for non-public safety and public safety FS licensees, that would commence with the December 8, 2003, publication of the *MSS Third R&O and Third MO&O* in the Federal Register as sought by petitioners. API/UTC has presented no new information that was not previously considered that would warrant revisiting the matter. In light of all the factors that were fully discussed in the *MSS Third R&O and Third MO&O*, including those acknowledged by petitioner, we believe that the rationale and circumstances that supported the decision to shorten the mandatory negotiation period remain essentially unchanged. Therefore, we continue to believe that the modified MSS/ATC negotiation periods of one-year, and two-years, for non-public safety and public safety FS licensees, respectively, reflect a proper balance of equities between FS and MSS/ATC licensees that will serve the public interest.

105. Finally API/UTC urges us to *require* relocation of both paths in a paired FS link whenever an MSS/ATC licensee relocates an FS link in the 2180-2200 MHz band. We decline to adopt this request. As an initial matter, we agree with petitioners that technical and economic considerations will generally make it more feasible to relocate both paired links in a two-way FS system at the same time. However, we are not persuaded by petitioners' concern that leaving the decision about relocating both links to the negotiation process would require incumbents to "prove over and again -- perhaps with costly and time-consuming engineering studies -- what is already known and apparent."[216] Indeed, petitioners recognize that situations may exist where neither party believes that relocating both links is necessary or practical. Petitioners also recognize, and we concur, that it should be readily apparent in most instances whether relocation of both paired links is the more appropriate course of action. In this light, we believe that the "good faith" requirement that prevails over all mandatory negotiations is sufficient to avoid unfairness to, or abuse by, any party. Furthermore, as noted throughout this proceeding, MSS/ATC licensees are likely to shoulder substantial financial burdens due to FS relocation. This burden could be somewhat mitigated in situations where relocation of only the 2180-2200 MHz path of a paired link might be appropriate. Therefore, we continue to believe that refraining from explicitly requiring relocation of both paired FS links and, thereby, leaving the matter to the good faith negotiation process, is a reasonable balance of equities that will serve the public interest.

VII. CONCLUSION

106. In the *Sixth R&O*, we have redesignated the 1915-1920 MHz band and 1995-2000 MHz bands for AWS use after finding that a separation distance of ten megahertz between PCS base and mobile transmit bands is sufficient to avoid interference with the adoption of appropriate technical limits; likewise redesignated the 2020-2025 MHz and 2175-2180 MHz bands for AWS use; adopted a UTAM reimbursement plan for the 1915-1920 MHz band and addressed reimbursement and relocation procedures for incumbent licensees in the 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz bands; denied the petitions for waiver and petitions for rulemaking related to the 1910-1920 MHz band; and provided additional flexibility for UPCS operations in the 1920-1930 MHz band. In the *Third MO&O* we addressed the petitions for reconsideration that were filed addressing actions in the *Second R&O* and *Third R&O* in the ET Docket 00-258 proceeding. Finally, in the *Fifth MO&O*, in ET Docket No. 95-18, we clarified the rules governing relocation of FS licensees by MSS and AWS licensees in the 2110-2150 MHz and 2180-2200 MHz bands. We find that the actions taken herein will serve the public interest, promote growth of new and innovative services, and will make the most efficient use of this spectrum.

VIII. PROCEDURAL MATTERS

[216] *Id.*

A. Final Regulatory Flexibility Analysis for Sixth Report and Order

107. Consistent with the Regulatory Flexibility Act, *see* 5 U.S.C. § 604, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) of the possible significant economic impact on small entities of the rules amended in this document. The FRFA is set forth in Appendix B.

B. Final Paperwork Reduction Act of 1995 Analysis

108. This Report and Order does not contain an information collection subject to the Paperwork Reduction act of 1995 (PRA), Public Law 104-13.

C. Contact Persons

109. For additional information concerning this Sixth Report and Order, Fifth MO&O, and Third MO&O, contact Shameeka Hunt or Priya Shrinivasan at (202) 418-2062 or via the Internet at Shameeka.Hunt@fcc.gov, or Priya.Shrinivasan@fcc.gov, respectively.

IX. ORDERING CLAUSES

110. Accordingly, IT IS ORDERED that pursuant to Sections 1, 4(i), 303(f) and (r), 309, 316, 332 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 151, 154(i), 303(f) and (r), 309, 316, and 332, the Report and Order and the rules specified in Appendix A ARE ADOPTED.

111. IT IS FURTHER ORDERED that the rules set forth in Appendix A WILL BECOME EFFECTIVE 30 days after publication in the Federal Register.

112. IT IS FURTHER ORDERED that the Petitions for Rulemaking filed by the Wireless Information Networks Forum and UTStarcom Inc., and the Petitions for Waiver filed by Lucent Technologies Inc., UTStarcom Inc. and Drew University, Ascom Wireless Solutions Inc., Alaska Power & Telephone Company Inc., and RBM Communications ARE DENIED.

113. IT IS FURTHER ORDERED that pursuant to sections 4(i), 302, 303(e) 303(f), 303(g), 303(r) and 405 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(e), 303(f), 303(g) and 405, the joint petition for clarification and reconsideration filed by the American Petroleum Institute and the United Telecom Council (API/UTC), in ET Docket No. 95-18, IS GRANTED IN PART to the extent discussed herein, and otherwise IS DENIED.

114. IT IS FURTHER ORDERED that the Petitions for Reconsideration filed by Sirius and XM, Sprint, and WCA ARE DENIED.

115. IT IS FURTHER ORDERED that the Petition for Partial Reconsideration filed by PCIA-The Wireless Infrastructure Association IS DISMISSED.

116. IT IS FURTHER ORDERED that the Petitions for Reconsideration filed by Celsat, CTIA, ICO, SIA, and TMI and TerreStar ARE DENIED.

117. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch,
Secretary

APPENDIX A: FINAL RULES

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR Parts 15, 74, 78, and 101 as follows:

PART 15 – RADIO FREQUENCY DEVICES

1. The authority citation for Part 15 continues to read as follows:

Authority: 47 U.S.C. 154, 302, 303, 304, 307, 336, and 544A.

2. Section 15.301 is amended to read as follows:

§ 15.301 Scope.

This subpart sets out the regulations for unlicensed personal communications services (PCS) devices operating in the 1920-1930 MHz and 2390-2400 MHz frequency bands.

3. Section 15.303 is amended by modifying paragraph (g) to read as follows:

§ 15.303 Definitions.

* * * * *

(g) *Personal Communications Services (PCS) Devices [Unlicensed].* International radiators operating in the frequency bands 1920-1930 MHz and 2390-2400 MHz that provide a wide array of mobile and ancillary fixed communication services to individuals and businesses.

* * * * *

4. Section 15.311 is amended by modifying the title and text to read as follows:

§ 15.311 Labeling requirements.

In addition to the labeling requirements of §15.19(a)(3), all devices operating in the frequency band 1920-1930 MHz authorized under this subpart must bear a prominently located label with the following statement: * * *

5. Section 15.319 is amended by modifying paragraph (a) to read as follows:

§ 15.319 General technical requirements.

(a) The 2390-2400 MHz band is limited to use by asynchronous devices under the requirements of § 15.321. * * *

* * * * *

6. Section 15.321 is amended by modifying the title and paragraphs (a) and (b) to read as follows:

§ 15.321 Specific requirements for asynchronous devices operating in the 2390-2400 MHz band.

(a) Operation shall be contained within the 2390-2400 MHz band. * * *

(b) All systems of less than 2.5 MHz emission bandwidth shall start searching for an available spectrum window within 3 MHz of the band edge at 2390 or 2400 MHz while systems of more than 2.5 MHz emission bandwidth will first occupy the center half of the band. * * *

* * * * *

7. Section 15.323 is amended by revising title, removing and reserving paragraph (b), and modifying paragraphs (a), (c), (c)(5), (c)(11), and (d) to read as follows:

§ 15.323 Specific requirements for devices operating in the 1920-1930 MHz sub-band.

(a) Operation shall be contained within the 1920-1930 MHz band. The emission bandwidth shall be less then 2.5 MHz. The power level shall be as specified in § 15.319(c), but in no event shall the emission bandwidth be less than 50 kHz.

(b) [removed and reserved]

(c) Devices must incorporate a mechanism for monitoring the time and spectrum windows that its transmission is intended to occupy. * * *

(5) If access to spectrum is not available as determined by the above, and a minimum of 40 duplex system access channels are defined for the system, the time and spectrum windows with the lowest power level below a monitoring threshold of 50 dB above the thermal noise power determined for the emission bandwidth may be accessed. A device utilizing the provisions of this paragraph must have monitored all access channels defined for its system within the last 10 seconds and must verify, within the 20 milliseconds (40 milliseconds for devices designed to use a 20 milliseconds frame period) immediately preceding actual channel access that the detected power of the selected time and spectrum windows is no higher than the previously detected value. The power measurement resolution for this comparison must be accurate to within 6 dB. No device or group of co-operating devices located within 1 meter of each other shall during any frame period occupy more than 6 MHz of aggregate bandwidth, or alternatively, more than one third of the time and spectrum windows defined by the system.

* * *

(11) An initiating device that is prevented from monitoring during its intended transmit window due to monitoring system blocking from the transmissions of a co-located (within one meter) transmitter of the same system, may monitor the portions of the time and spectrum windows in which they intend to receive over a period of at least 10 milliseconds. The monitored time and spectrum window must total at least 50 percent of the 10 millisecond frame interval and the monitored spectrum must be within 1.25 MHz of the center frequency of channel(s) already occupied by that device or co-located co-operating devices. If the access criteria is met for the intended receive time and spectrum window under the above conditions, then transmission in the intended transmit window by the initiating device may commence.

* * *

(d) Emissions outside the sub-band shall be attenuated below a reference power of 112 milliwatts as follows: 30 dB between the sub-band and 1.25 MHz above or below the sub-band; 50 dB between 1.25 and 2.5 MHz above or below the sub-band; and 60 dB at 2.5 MHz or greater above or below the sub-band. Emissions inside the sub-band must comply with the following emission mask: In the bands

between 1B and 2B measured from the center of the emission bandwidth the total power emitted by the device shall be at least 30 dB below the transmit power permitted for that device; in the bands between 2B and 3B measured from the center of the emission bandwidth the total power emitted by an intentional radiator shall be at least 50 dB below the transmit power permitted for that radiator; in the bands between 3B and the sub-band edge the total power emitted by an intentional radiator in the measurement bandwidth shall be at least 60 dB below the transmit power permitted for that radiator. "B" is defined as the emission bandwidth of the device in hertz. Compliance with the emission limits is based on the use of measurement instrumentation employing peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

* * * * *

PART 74 – EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCASTING AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

The authority citation for Part 74 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303, 307, 336(f), 336(h) and 554.

8. Section 74.690 is revised to amend sections (a) to read as follows:

§ 74.690 Transition of the 1990-2025 MHz band from the Broadcast Auxiliary Service to emerging technologies.

(a) New Entrants are collectively defined as those licensees proposing to use emerging technologies to implement Mobile Satellite Services in the 2000-2020 MHz band (MSS licensees), those licensees authorized after July 1, 2004 to implement new Fixed and Mobile services in the 1990-1995 MHz band, and those licensees authorized after September 9, 2004 in the 1995-2000 MHz and 2020-2025 MHz bands. New entrants may negotiate with Broadcast Auxiliary Service licensees operating on a primary basis and fixed service licensees operating on a primary basis in the 1990-2025 MHz band (Existing Licensees) for the purpose of agreeing to terms under which the Existing Licensees would relocate their operations to the 2025-2110 MHz band, to other authorized bands, or to other media; or, alternatively, would discontinue use of the 1990-2025 MHz band. New licensees in the 1995-2000 MHz and 2020-2025 MHz bands are subject to the specific relocation procedures adopted in WT Docket 04-356.

* * * * *

PART 78 – CABLE TELEVISION RELAY SERVICE

9. The authority citation for Part 78 continues to read as follows:

AUTHORITY: Secs. 2, 3, 4, 301, 303, 307, 308, 309, 48 Stat., as amended, 1064, 1065, 1066, 1081, 1082, 1083, 1084, 1085; 47 U.S.C. 152, 153, 154, 301, 303, 307, 308, 309.

10. Section 78.40 is revised to amend sections (a) to read as follows:

§ 78.40 Transition of the 1990-2025 MHz band from the Cable Television Relay Service to

emerging technologies.

(a) New Entrants are collectively defined as those licensees proposing to use emerging technologies to implement Mobile Satellite Services in the 2000-2020 MHz band (MSS licensees), those licensees authorized after July 1, 2004 to implement new Fixed and Mobile services in the 1990-1995 MHz band, and those licensees authorized after September 9, 2004 in the 1995-2000 MHz and 2020-2025 MHz bands. New entrants may negotiate with Cable Television Relay Service licensees operating on a primary basis and fixed service licensees operating on a primary basis in the 1990-2025 MHz band (Existing Licensees) for the purpose of agreeing to terms under which the Existing Licensees would relocate their operations to the 2025-2110 MHz band, to other authorized bands, or to other media; or, alternatively, would accept a sharing arrangement with the New Entrants that may result in an otherwise impermissible level of interference to the Existing Licensee's operations. New licensees in the 1995-2000 MHz and 2020-2025 MHz bands are subject to the specific relocation procedures adopted in WT Docket 04-356.

* * * * *

PART 101 – FIXED MICROWAVE SERVICES

11. The authority citation for Part 101 continues to read as follows:

Authority: 47 U.S.C. 154, 303.

12. Section 101.69 is amended by revising text, paragraphs (b) and (d) and adding a new paragraphs (e) and (f) to read as follows:

§ 101.69 Transition of the 1850-1990 MHz, 2110-2150 MHz, and 2160-2200 MHz bands from the fixed microwave services to personal communications services, emerging technologies, and other related services.

Fixed Microwave Services (FMS) in the 1850-1990 MHz, 2110-2150 MHz, and 2160-2200 MHz bands have been allocated for use by emerging technology (ET) services, including Personal Communications Services (PCS), Advanced Wireless Services (AWS), and Mobile Satellite Services (MSS). The rules in this section provide for a transition period during which ET licensees may relocate existing FMS licensees using these frequencies to other media or other fixed channels, including those in other microwave bands.

* * * * *

(b) Except as provided in paragraph (c) and (f) of this section, FMS operations in the 1850-1990 MHz, 2110-2150 MHz, and 2160-2200 MHz bands, with the exception of public safety facilities defined in § 101.77, will continue to be co-primary with other users of this spectrum until two years after the FCC commences acceptance of applications for ET service (voluntary negotiation period), and until one year after an ET licensee initiates negotiations for relocation of the fixed microwave licensee's operations (mandatory negotiation period). In the 1920-1930 MHz band allocated for unlicensed PCS, FMS operations will continue to be co-primary until one year after UTAM, Inc. initiates negotiations for relocation of the fixed microwave licensee's operations. * * *

* * * * *

(d) Relocation of FMS licensees in the 2110-2150 and 2160-2200 MHz band will be subject to

mandatory negotiations only. Except as provided in paragraph (e) of this section, mandatory negotiation periods are defined as follows:

(1) Non-public safety incumbents will have a two-year mandatory negotiation period; and

(2) Public safety incumbents will have a three-year mandatory negotiation period.

(e) Relocation of FMS licensees by Mobile-Satellite Service (MSS) licensees, including MSS licensees providing Ancillary Terrestrial Component (ATC) service, will be subject to mandatory negotiations only. Mandatory negotiation periods that are triggered in the first instance by MSS/ATC licensees are defined as follows:

(1) The mandatory negotiation period for non-public safety incumbents will end December 8, 2004.

(2) The mandatory negotiation period for public safety incumbents will end December 8, 2005.

(f) AWS licensees operating in the 1910-1920 MHz and 2175-2180 MHz bands will follow the requirements and procedures set forth in ET Docket No. 00-258 and WT Docket No. 04-356.

13. Section 101.73 is amended by revising paragraphs (a) and (d) to read as follows:

§ 101.73 Mandatory Negotiations.

(a) If a relocation agreement is not reached during the voluntary period, the ET licensee may initiate a mandatory negotiation period. This mandatory period is triggered at the option of the ET licensee, but ET licensees may not invoke their right to mandatory negotiation until the voluntary negotiation period has expired. Relocation of FMS licensees by Mobile-Satellite Service (MSS) licensees, including MSS licensees providing Ancillary Terrestrial Component (ATC) service, will be subject to mandatory negotiations only.

* * * * *

(d) Provisions for Relocation of Fixed Microwave Licensees in the 2110-2150 and 2160-2200 MHz bands. Except as otherwise provided in §101.69 (e) pertaining to FMS relocations by MSS/ATC licensees, mandatory negotiations will commence when the ET licensee informs the fixed microwave licensee in writing of its desire to negotiate. Mandatory negotiations will be conducted with the goal of providing the fixed microwave licensee with comparable facilities, defined as facilities possessing the following characteristics:

* * * * *

14. Section 101.79 is amended by revising the title to read as follows:

§ 101.79 Sunset provision for licensees in the 1850-1990 MHz, 2110-2150 MHz, and 2160-2200 MHz bands.

* * * * *

APPENDIX B: FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act (RFA)[1] an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Third Notice of Proposed Rulemaking* (*Third NPRM*).[2] The Commission sought written public comments on the proposals in the *Third NPRM*, including comment on the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[3]

Need for, and Objectives of, the Sixth Report and Order

The *Sixth Report and Order* (*Sixth R&O*) continues our efforts to allocate spectrum that can be used for the provision of advanced wireless services (AWS) to the public, which in turn supports our obligations under Section 706 of the 1996 Telecommunications Act[4] and, more generally, serves the public interest by promoting rapid and efficient radio communications facilities.

The *Sixth R&O* discusses the need for spectrum allocations to allow for the provision of AWS. Specifically, it:

- Refutes argument that Broadband PCS mobile and base transmit bands must have separation of fifteen megahertz, and found that a ten megahertz separation is suitable without causing interference between services in these bands.
- Redesignated the 1915-1920 MHz and 2020-2025 MHz bands for AWS use.
- Redesignated the 2020-2025 MHz and 2175-2180 MHz bands for AWS use.
- Paired the 1915-1920 and 1995-2000 MHz bands and 2020-2025 and 2175-2180 MHz bands for the provision of AWS use.
- Adopts the UTAM reimbursement plan for the 1915-1920 MHz band, allowing relocation efforts of microwave links to continue in the 1910-1930 MHz band without disruption, while making the band available for other spectrum efficient services.
- Denies all petitions for rulemaking and petitions for waivers filed in this proceeding regarding the 1910-1920 MHz band.
- Provided additional flexibility for UPCS operations in the 1920-1930 MHz band.

Summary of Significant Issues Raised by Public Comments in Response to the IRFA

There were no comments filed that specifically addressed the rules and policies proposed in the

[1] *See* 5 U.S.C. § 603. The RFA (codified at 5 U.S.C. §§ 601-612) has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[2] 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, IB Docket No. 99-81, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2223 (2003).

[3] *See* 5 U.S.C. § 604.

[4] Section 706 of the Communications Act of 1934, as amended, codified at 47 U.S.C. § 157.

IRFA.

Description and Estimate of the Number of Small Entities to Which the Rules Will Apply

The RFA directs agencies to provide a description of, and, where feasible, an estimate of, the number of small entities that may be affected by the rules adopted herein.[5] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[6] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[7] Nationwide, there are a total of 22.4 million small businesses, according to SBA data.[8] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[9]A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[10] Nationwide, there are approximately 1.6 million small organizations.[11] The term "small governmental jurisdiction" is defined as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[12] As of 1997, there were approximately 87,453 governmental jurisdictions in the United States.[13] This number includes 39,044 county governments, municipalities, and townships, of which 37,546 (approximately 96.2%) have populations of fewer than 50,000, and of which 1,498 have populations of 50,000 or more. Thus, we estimate the number of small governmental jurisdictions overall to be 84,098 or fewer.

Broadcast Auxiliary Service (BAS). BAS involves a variety of transmitters, generally used to relay broadcast programming to the public (through translator and booster stations) or within the program distribution chain (from a remote news gathering unit back to the stations). The Commission has not developed a definition of small entities specific to broadcast auxiliary licensees. The U.S. Small Business Administration (SBA) has developed small business size standards, as follows: 1) For TV BAS, we will use the size standard for Television Broadcasting, which consists of all such companies having annual receipts of no more than $12.0 million;[14] 2) For Aural BAS, we will use the size standard for Radio Stations, which consists of all such companies having annual receipts of no more than $6

[5] 5 U.S.C. § 604(a)(3).

[6] 5 U.S.C. § 601(6).

[7] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[8] *See* SBA, Programs and Services, SBA Pamphlet No. CO-0028, at page 40 (July 2002).

[9] 15 U.S.C. § 632.

[10] 5 U.S.C. § 601(4).

[11] Independent Sector, The New Nonprofit Almanac & Desk Reference (2002).

[12] 5 U.S.C. § 601(5).

[13] U.S. Census Bureau, Statistical Abstract of the United States: 2000, Section 9, pages 299-300, Tables 490 and 492.
[14] 13 C.F.R. § 121.201, NAICS code 515120.

million;[15] 3) For Remote Pickup BAS we will use the small business size standard for Television Broadcasting when used by a TV station and that for Radio Stations when used by such a station.

According to Commission staff review of BIA Publications, Inc. Master Access Television Analyzer Database as of May 16, 2003, about 814 of the 1,220 commercial television stations in the United States had revenues of $12 million or less. We note, however, that, in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations[16] must be included.[17] Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. There are also 2,127 low power television stations (LPTV).[18] Given the nature of this service, we will presume that all LPTV licensees qualify as small entities under the SBA size standard. According to Commission staff review of BIA Publications, Inc., Master Access Radio Analyzer Database, as of May 16, 2003, about 10,427 of the 10,945 commercial radio stations in the United States had revenue of $6 million or less. We note, however, that many radio stations are affiliated with much larger corporations with much higher revenue, and, that in assessing whether a business concern qualifies as small under the above definition, such business (control) affiliations[19] are included.[20] Our estimate, therefore, likely overstates the number of small businesses that might be affected by our action.

Cable Antenna Relay Service (CARS). CARS includes transmitters generally used to relay cable programming within cable television system distribution systems. The SBA has developed a small business size standard for Cable and other Program Distribution, which consists of all such companies having annual receipts of no more than $12.5 million. According to Census Bureau data for 1997, there were 1,311 firms within the industry category Cable and Other Program Distribution, total, that operated for the entire year.[21] Of this total, 1,180 firms had annual receipts of under $10 million, and an additional fifty-two firms had receipts of $10 million to $24,999,999.00.[22] Thus, under this standard, the majority of firms can be considered small.

Fixed Microwave Services. Microwave services include common carrier,[23] private-operational

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[15] *Id.* NAICS code 515112.

[16] "Concerns are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both." 13 C.F.R. § 121.103(a)(1).

[17] "SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic concern's size." 13 C.F.R. § 121.103(a)(4).

[18] FCC News Release, "Broadcast Station Totals as of September 30, 2002" (Nov. 6, 2002).

[19] "Concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both." 13 C.F.R. § 121.103(a)(1).

[20] "SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size." 13 C.F.R. § 121.103(a)(4).

[21] 13 C.F.R. § 121.201, NAICS code 517510 (changed from 513220 in October 2002).

[22] *Id.*

[23] 47 CFR Part 101 *et seq.* (formerly, part 21 of the Commission's Rules).

fixed,[24] and broadcast auxiliary radio services.[25] At present, there are approximately 36,708 common carrier fixed licensees and 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. The Commission has not yet defined a small business with respect to microwave services. For purposes of the FRFA, we will use the SBA's definition applicable to wireless and other telecommunications companies—*i.e.*, an entity with no more than 1,500 persons.[26] According to Census Bureau data for 1997, there were 977 firms in this category, total, that operated for the entire year.[27] Of this total, 965 firms had employment of 999 or fewer employees, and an additional twelve firms had employment of 1,000 employees or more.[28] Thus, under this size standard, majority of firms can be considered small.

We note that the number of firms does not necessarily track the number of licensees. We estimate that all of the Fixed Microwave licensees (excluding broadcast auxiliary licensees) would qualify as small entities under the SBA definition. Of these licenses, approximately fourteen are issued for frequencies in the Emerging Technology bands affected by this proceeding. This, assuming that these entities also qualify as small businesses, as many as fourteen small business licensees could be affected by the rules we adopt. We note that these entities have been subject to relocation by UTAM under rules originally adopted in the Commission's *Emerging Technologies* proceeding. UTAM is the Commission's frequency coordinator for UPCS devices in the 1910-1930 MHz band. The *Sixth Report and Order* anticipates that these general relocation rules will continue to apply to FS microwave licensees and does not propose to modify the class of licensees that are subject to these relocation provisions.

Mobile Satellite Service. Neither the Commission nor the U.S. Small Business Administration has developed a small business size standard specifically for mobile satellite service licensees. The appropriate size standard is therefore the SBA standard for Satellite Telecommunications, which provides that such entities are small if they have $12.5 million or less in annual revenues.[29] Currently, nearly a dozen entities are authorized to provide voice MSS in the United States. We have ascertained from published data that four of those companies are not small entities according to the SBA's definition,[30] but we do not have sufficient information to determine which, if any, of the others are small

[24]Persons eligible under Parts 80 and 90 of the Commission's rules can use Private-Operational Fixed Microwave services. *See* 47 CFR parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station, and only for communications related to the licensee's commercial, industrial, or safety operations.

[25]Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. *See* 47 CFR Part 74 *et seq*. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

[26]13 C.F.R. § 121.201, NAICS code 517212 (formerly 213322).

[27]U.S. Census Bureau, 1997 Economic Census, Subject Series: Information, "Employment Size of Firms Subject to Federal Income Tax: 1997," Table 5, NAICS code 217212 (issues Oct. 2000).

[28]*Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is "Firms with 1,000 employees or more."

[29]13 C.F.R. § 121.201, North American Industry Classification System ("NAICS") code 51740, formerly NAICS code 513340.

[30]Comsat Corporation, Globalstar USA, Honeywell International, Inc., and Mobile Satellite Ventures Subsidiary (continued....)

entities. We anticipate issuing several licenses for 2 GHz mobile earth stations that would be subject to the requirements we are adopting here. We do not know how many of those licenses will be held by small entities, however, as we do not yet know exactly how many 2 GHz mobile-earth-station licenses will be issued or who will receive them.[31] The Commission notes that small businesses are not likely to have the financial ability to become MSS system operators because of high implementation costs, including construction of satellite space stations and rocket launch, associated with satellite systems and services.

Unlicensed Personal Communications Services. As its name indicates, UPCS is not a licensed service. UPCS consists of intentional radiators operating in the frequency bands 1920-1930 MHz and 2390-2400 MHz, that provide a wide array of mobile and ancillary fixed communication services to individuals and businesses. The *Sixth Report and Order* affects UPCS operations in the 1920-1930 MHz band; operations in those frequencies are given flexibility to deploy both voice and data-based services. There is no accurate source for the number of operators in the UPCS. The Commission has not developed a definition of small entities applicable to UPCS equipment manufacturers. However, the SBA has developed a small business size standard, Cellular and Other Wireless Carriers, which consists of all such companies having 1500 or fewer employees.[32] According to the Census Bureau data for 1997, there were 977 firms in this category, total, that operated for the entire year.[33] Of this total, 965 firms had employment of 999 or fewer employees, and an additional 12 firms had employment of 1,000 employees or more.[34] Thus, under this size standard, the great majority of firms can be considered small.

Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

The *Sixth R&O* addresses the possible use of the bands 1915-1920 MHz and 1995-2000 MHz to support the introduction of new AWS, but does not propose service rules. Thus, the item contains no new reporting requirements. The *Sixth R&O* modifies the procedures by which incumbent licensees in the 1915-1920 MHz and 1995-2000 MHz band are to be relocated by new entrants. The relocation

(Continued from previous page)
LLC ("MSVS") each holds one of the current licenses for 1.6 GHz mobile satellite stations. Comsat Corporation reported annual revenue of $618 million in its most recent annual report to the U.S. Securities and Exchange Commission ("SEC"). Globalstar USA (formerly AirTouch Satellite Services) is a indirectly majority-owned by Thermo Satellite LP, a Colorado limited partnership. (See International Authorizations Granted, Public Notice, 19 FCC Rcd 4079 (2004)). In another annual report filed with the SEC, Honeywell International Inc. reported receiving sales revenue of $23.7 billion in 2001. MSVS is wholly owned by a limited partnership that is 48.1% owned by Motient Corporation and 39.9% owned by a limited partnership controlled by a wholly-owned subsidiary of BCE, Inc. In an annual report filed with the SEC, Motient reported revenue of $93.3 billion for calendar year 2001. BCE, Inc. reports in its corporate website, http://www.bce.ca/en/investors/reports/annual/bce/2002annual/bce_ar02_04_e.html, that it received $19.8 billion of revenue in 2002.

[31]There are currently four space-station authorizations for Mobile Satellite Service systems that would operate with 2 GHz mobile earth stations. Although we know the number and identity of the space-station operators, neither the number nor the identity of future 2 GHz mobile-earth-station licensees can be determined from that data.

[32]13 C.F.R. § 121.201, North American Industry Classification System (NAICS) code 517212.

[33]U.S. Census Bureau, 1997 Economic Census, Subject Series: Information, "Employment Size of Firms Subject to Federal Income Tax: 1997," Table 5, NAICS code 517212 (issued Oct. 2000).

[34]*Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is "Firms with 1,000 employees or more."

procedures set forth in the *Sixth R&O* are based on relocation procedures that had been previously adopted for larger blocks of spectrum that include the bands 1915-1920 MHz and 1995-2000 MHz, but that did not account for new AWS entrants in these bands. For example, the *Sixth R&O* determines that the principle that new licensees must reimburse UTAM, Inc., for a proportional share of the band-clearing costs UTAM has incurred in relocating the 1910-1930 MHz band should apply to new AWS entrants in the 1915-1920 MHz band. The *Sixth R&O* modifies previously established recordkeeping and other compliance requirements but does not substantively add to those requirements. Licensees that were previously subject to relocation requirements will still be subject to relocation requirements, but now may be involved in relocation discussions with additional entities – *i.e.* AWS licensees. Similarly, new entrants that were required to share relocation costs now may share those costs with new AWS licensees.

Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in developing its approach, which may include the following four alternatives (among others): "(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities."[35]

The Commission considered and rejected proposals to not redesignate the 1915-1920 MHz band for AWS. One alternative proposed by Ascom, Siemens, Verizon and others would have had us retain this band for unlicensed PCS use and modify the pre-existing UPCS rules to allow for a greater variety of applications in the band. To the extent that small entities are UPCS users, and users of unlicensed bands are typically exempt from the reporting requirements that are necessary to secure, maintain, and renew a license that is a necessary requirement for operation under our licensed service rules, the retention of the 1915-1920 MHz band for UPCS might have minimized the economic impact on small entities. We rejected this approach because we concluded that it is feasible to introduce high powered licensed services into the band, there is a need for additional spectrum for AWS applications, and there are no current users of the 1915-1920 MHz band. Even if we were to modify the rules to allow greater UPCS use of the band, the types of applications that could be deployed under the UPCS rules would not provide the public benefits associated with AWS applications.

Report to Congress

The Commission will send a copy of the Sixth Report and Order including FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.[36] In addition, the Commission will send a copy of the Fourth Report and Order, including FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of the Fifth Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register.[37]

[35] 5 U.S.C. § 603(c)(1)-(c)(4).

[36] *See* 5 U.S.C. § 801(a)(1)(A).

[37] See 5 U.S.C. § 604(b).

APPENDIX C: LIST OF COMMENTING PARTIES
Commenters to the *Third Notice of Proposed Rulemaking*

Comments (due April 14, 2003)

Ad Hoc MDS Alliance (Ad Hoc)
ArrayComm
Ascom Tateco AB, Sweden (Ascom)
Cingular Wireless (Cingular)
Cellular Telecommunications and Internet Association (CTIA)
DCT Los Angeles (DCT)
Ericsson
ICO Global Communications (ICO)
JSM Electronics (JSM)
Motorola
Nextel Communications (Nextel)
Nucentrix Broadband Networks (Nucentrix)
PCIA, The Wireless Infrastructure Association (PCIA)
PHS MoU Group (PHS)
Siemens
Society of Broadcast engineers (SBE)
Stellar Holdings (Stellar)
UTAM
UTStarcom
Verizon Wireless (Verizon)
Wireless Communications Association International (WCA)

Reply Comments (due April 28, 2003)

Ad Hoc
AT&T Wireless Services (AT&T)
Ericsson
ICO
Inventel
Lucent Technologies (Lucent)
Midstate Communications (Midstate)
Motorola
Nextel
Peñasco Valley Telephone Cooperative (Peñasco)
Philips Business Communications (PBC)
SBE
Sprint Corporation (Sprint)
UTStarcom
Verizon
WCA

Petition for Reconsiderations to the *Second Report and Order*

PCIA
Sprint
WCA

Opposition and Reply to Petition for Reconsideration to the *Second Report and Order*

AT&T and Verizon
Sprint
WCA

Petition for Reconsiderations to the *Third Report and Order*

Celsat America, Inc. (Celsat)
CTIA
ICO
Satellite Industry Association (SIA)
TMI Communications (TMI) and TerreStar Networks Inc. (TerreStar)

Opposition, Comments, and Reply to Petition for Reconsideration to the *Third Report and Order*

AT&T, Cingular, Verizon
Boeing
CTIA
Globalstar
ICO
SIA
WCA

STATEMENT OF CHAIRMAN MICHAEL K. POWELL

Re: Service Rules for Advanced Wireless Services in the1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz, and 2175-2180 MHz Bands, Notice of Proposed Rulemaking; (WT Docket No. 04-356); and Sixth Report and Order, Third Memorandum Opinion and Order (ET Docket No. 00-258), and Fifth Memorandum Opinion and Order (ET Docket No. 95-18)

One of our core mandates is to promote the efficient use of spectrum. Today we further that mandate by making available 20 MHz of spectrum suitable for the provision of new advanced wireless services and technology.

The 20 MHz of licensed spectrum we make available, in addition to the 90 MHz of spectrum previously made available, will help expedite the delivery of licensed broadband Internet wireless service to all consumers across the nation. As is evident from today's Ninth Competition Report, wireless providers are increasingly utilizing their licensed spectrum holdings to build infrastructure to support Internet applications. This additional spectrum will enable providers to employ more bandwidth-intensive applications and services and expedite the delivery of true broadband access.

Overall, our allocation and proposed service rules seek to maximize the flexibility of licensees to choose the types and characteristics of the services that they will offer in their licensed spectrum and define spectrum users' rights and responsibilities clearly. We also address an appropriate relocation and reimbursement policy to compensate entities for expenses incurred in relocating incumbents.

There have been interference concerns raised in the record about proceeding with the designation of the 1915-1920 MHz band for advanced wireless services. I particularly note and appreciate the efforts of Sprint and Nokia to produce, under very short time frames, real world test results for our analysis. I believe that today's designation decision combined with the initiation of a service rules proceeding will afford the Commission latitude to address comprehensively the existing and future test results about the most viable and valuable uses of this band. In the end, my colleagues and I unanimously felt that we could proceed responsibly now and produce services rules responsive to a full record on these issues.

In sum, we strike the right balance by promoting the efficient use and availability of spectrum while at the same time seeking comments on a number of licensing, technical, and operational rules to govern the use of the 20 megahertz of spectrum designated for AWS. I know that these rules are of great interest and I welcome industry input and independent testing on these issues.

Lastly, I applaud the collaborative efforts of the Wireless Telecommunication Bureau and the Office of Engineering and Technology in helping to bring these important items before the Commission.

STATEMENT OF COMMISSIONER MICHAEL J. COPPS

Re: *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); Petition for Rulemaking of the Wireless Information Networks Forum Concerning the Unlicensed Personal Communications Service (RM-9498); Petition for Rulemaking of UTStarcom, Inc., Concerning the Unlicensed Personal Communications Service (RM-10024); and 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).*

Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz, and 2175-2180 MHz (WT Docket No. 04-356).

I support both the allocation order and the service rules NPRM with the hope that this band will bring new service to American consumers in the near future. This can be a real boon for advanced telecommunications. At the same time, we have our work cut out to make it a reality. Importantly, the Commission must ensure that the use of this band does not cause unacceptable interference to consumers who currently use proximate bands. Because of the importance of the surrounding bands, and because of the allegations made by terrestrial mobile and satellite license holders, I support deferring interference findings until more information can be collected as part of the NPRM process. Once we have this information, I hope that we will integrate it into our final decision as quickly as possible. We also have some standards matters to resolve with our friends in Canada and Mexico. I look forward to accomplishing all this work and to bringing an advanced generation of new services to America's consumers.

STATEMENT OF COMMISSIONER JONATHAN S. ADELSTEIN

Re: 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); Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands; (WT Docket No. 04-356)

It's always exciting to consider new spectrum opportunities. I very much appreciate the efforts of the Office of Engineering and Technology and the Wireless Telecommunications Bureau to explore new ways to improve the use of spectrum. I have talked before about one of my goals to maximize the services and information that flow over our nation's airwaves. And the items before us can really help to further that goal.

At the same time, there clearly are some challenges in looking at new services for the so-called "H" block. I am pleased that we are moving forward a little cautiously on some of the technical issues presented by possible use of this band. In promoting new services, we always need to make sure that we are adequately protecting any existing service. In this case, we must ensure that our rules shield the significant base of existing PCS customers from harmful interference. Consistent with a framework for innovation, the Commission has a responsibility to establish ground rules for ensuring that harmful interference does not occur – while still striving to promote new technologies and services.

I think we are on the right track here. We have teed up a lot of good discussion in the NPRM on the interference issue. I look forward to hearing the result of industry tests over the next several months and to following the healthy debate that is sure to follow. I am pleased with the outcome today, and think we have struck just the right balance in addressing these valuable pieces of spectrum.