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

In the Matter of	)	
	)	
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 Parts 21 and 74 of the Commission's Rules With Regard to Licensing in the Multipoint Distribution Service and 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
	)	
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
	)	
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

ORDER ON RECONSIDERATION AND FIFTH MEMORANDUM OPINION AND ORDER AND THIRD MEMORANDUM OPINION AND ORDER AND SECOND REPORT AND ORDER

Adopted: April 12, 2006 **Released:** April 27, 2006

By the Commission: Chairman Martin and Commissioner Tate issuing a joint statement; Commissioner Copps concurring and issuing a separate statement, Commissioner Adelstein concurring in part and issuing a separate statement.

TABLE OF CONTENTS

Heading — Paragraph #

I. INTRODUCTION 1
II. EXECUTIVE SUMMARY 3
III. BACKGROUND 6
A. Big LEO Order on Reconsideration and AWS 5th MO&O 6
B. BRS/EBS 3rd MO&O and 2nd R&O 9
IV. DISCUSSION 20
A. Big LEO Order on Reconsideration and AWS 5th MO&O 20
1. Relocation Policy and BRS Operators 21
2. MSS and BRS Operations in the 2496-2500 MHz Band 27
3. Grandfathered BAS Operations 35
4. Grandfathered Part 90 and Part 101 Operations 43
5. Industrial, Science, and Medical Operations 48
6. Procedural issues 57
B. BRS/EBS 3rd MO&O 59
1. Transition 59
a. Transition areas 61
(i) Size 61
(ii) Overlapping GSAs 66
b. MVPD opt-out 68
(i) General discussion 68
(ii) WATCH TV Waiver Request to "Opt-Out" 75
c. Proponents 85
(i) Eligibility to be a proponent 86
(ii) Determining single and multiple proponents 88
d. Initiation Phase 96
(i) Pre-Transition Data Requests 96
(ii) Initiation Plans 103
e. Transition Planning Phase 107
(i) Safe Harbors 108
(ii) Eligibility restrictions/channel swapping 120
(iii) Financial penalties in dispute resolution process 123
(iv) Relocation of BRS Channels No. 1 and 2 127
f. Self-transitions 133
(i) Authority to self-transition 133
(ii) Implementation of self-transitions 136
g. Transition Completion Phase 144
(i) Replacement Downconverters 145
(ii) Transition deadline 148
(iii) Post-transition Notification 151
h. Transition Costs 153

(i) Proponent-driven transitions 153
(ii) Cost of EBS self-transitions 173
i. Dispute resolution 177
j. Bureau Reports 179
2. Technical issues 181
a. Interference Protection Rules 181
(i) Receive sites 181
(ii) Adjacent channel 184
b. Signal Strength Limits 187
c. Emission Limits 191
(i) Documented Interference Complaint Requirement 191
(ii) Who can file a complaint 194
(iii) Deadline for interference complaints 196
(iv) User stations 198
d. 2495-2496 MHz Guard Band 202
e. Geographic Service Areas 205
f. Modifications to Geographic Area Licensing 209
g. Unlicensed Operations 215
h. Minimum Performance Requirements for EBS receive sites 219
i. Miscellaneous Corrections to Sections 27.5 and 27.1221 221
3. Minimum usage requirements 223
4. Cable/ILEC Cross Ownership 229
5. Mutually exclusive applications 233
6. Leasing Issues 240
a. License Purchase Rights 244
b. Filing of Excess Capacity Leases 249
c. Limitation on Length of EBS Leases 254
d. Other Leasing Issues 271
C. *BRS/EBS Second Report and Order* 274
1. Performance Requirements 274
a. Use of Substantial Service 274
b. Safe Harbors 281
c. Additional Safe Harbors for EBS Licensees 291
d. Service to Rural Areas 293
e. Demonstration of Substantial Service – Per License vs. Per Channel Group v. System wide 295
f. Deadline for Demonstrating Substantial Service 299
g. Credit for Discontinued Service 305
h. Provisioning of Service to Customers and Students 308
2. Licensing Unassigned and Untransitioned Spectrum in the Band 311
a. How to Assign Available Spectrum – 311
b. Eligibility to Apply for New Licenses. 314
c. When to Assign New Licenses 316
d. Additional New License Issues. 325
e. Alternative Transitions to the New Band Plan and New Licenses. 327
3. Grandfathered E and F Channel EBS Stations 333
4. Four channel rule 355
5. Wireless Cable Exception 360
6. Regulatory Fees 367

7. Gulf of Mexico Proceeding 377
V. PROCEDURAL MATTERS 384
A. Final Regulatory Flexibility Analysis of *BRS/EBS 3rd MO&O and 2nd R&O* 384
B. Final Regulatory Flexibility Act Certification of *Big LEO Order on Reconsideration* 385
C. Paperwork Reduction Analysis 388
D. Further Information 390
VI. ORDERING CLAUSES 391
APPENDIX A: FINAL RULES
APPENDIX B: FINAL REGULATORY FLEXIBILITY ANALYSIS
APPENDIX C: LIST OF FILERS TO *BIG LEO ORDER ON RECONSIDERATION AND AWS 5th MO&O*
APPENDIX D: LIST OF PETITIONERS TO *BRS/EBS R&O*
APPENDIX E: LIST OF COMMENTERS TO *BRS/EBS FNPRM*

I. INTRODUCTION

1. In the attached *Order on Reconsideration and Fifth Memorandum Opinion and Order* (*Big LEO Order on Reconsideration and AWS 5th MO&O*), we affirm the Commission's decision in the *Big LEO Spectrum Sharing Order*[1] to establish a plan for sharing between the fixed and mobile (except aeronautical mobile) services and Code Division Multiple Access (CDMA) Mobile-Satellite Service (MSS) operators in the 2495-2500 MHz band. This decision, along with those in this *Third Memorandum Opinion and Order and Second Report and Order (BRS/EBS 3rd MO&O and 2nd R&O)*, continue our efforts to transform our rules and policies governing the licensing of the Educational Broadband Service (EBS) and the Broadband Radio Service (BRS) (collectively, the Services) in the 2495-2690 MHz band.[2] Among other modifications to our rules, we require that new BRS/EBS band plan transitions take place in Basic Trading Areas (BTAs) instead of Major Economic Areas (MEAs), and we allow licensees the option to self-transition after 30 months after the effective date of the amended rules in markets where a proponent has not come forward. In addition, we adopt substantial service requirements and safe harbors for BRS and EBS licensees and we establish new rules for grandfathered EBS stations operating on the E and F channel groups.

2. Our actions in this proceeding are designed to provide both incumbent licensees and potential new entrants in the 2495-2690 MHz band with greatly enhanced flexibility to encourage the

[1] Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands; Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Service to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems, IB Docket No. 02-364, ET Docket No. 00-258, *Report and Order, Fourth Report and Order and Further Notice of Proposed Rulemaking*, FCC 04-134, 19 FCC Rcd 13386 (2004) (*Big LEO Spectrum Sharing Order*).

[2] The two services in the 2500-2690 MHz band, the Instructional Television Fixed Service (ITFS) and the Multichannel Multipoint Distribution Service (MMDS), and the Multipoint Distribution Service (MDS) in the 2150-2162 MHz band were renamed by the Commission in 2004. The ITFS service became the Educational Broadband Service (EBS) and the MMDS and MDS services became the Broadband Radio Service (BRS). *See* 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, *Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 03-66, 19 FCC Rcd 14165, 14169 ¶ 6 (2004) (*BRS/EBS R&O* and *FNPRM* as appropriate).

efficient and effective use of spectrum domestically and internationally, and the growth and rapid deployment of innovative and efficient communications technologies and services.[3] Specifically, we provide the opportunity for operators using different technologies and/or services to have access to the same spectrum. Moreover, we facilitate the development of wireless broadband systems in this band that could offer consumers another choice for broadband access -- competing in price and features with existing landline offerings, reaching areas not currently served by landline networks, and offering consumers portability or mobility. In addition, we facilitate use of this band by educational institutions, thereby improving the ability of educators to serve America's students through wireless technology. Accordingly, through these actions, we make further progress towards our goal of providing all Americans with universal, affordable access to broadband technology.[4]

II. EXECUTIVE SUMMARY

3. In the *Big LEO Order on Reconsideration and AWS 5th MO&O*,[5] we take the following actions with respect to petitions for reconsideration filed in response to the *Big LEO Spectrum Sharing Order*:

- Affirm the Commission's decision to allocate the 2495-2500 MHz band for fixed and mobile (except aeronautical mobile) services on a primary basis, shared with the MSS on an unprotected basis.
- Conclude that BRS/EBS and MSS operators have compatible characteristics that enable them to share certain portions of the 2495-2500 MHz band through engineering solutions, without causing harmful interference.
- Adopt specific power flux density (PFD) limits for CDMA MSS downlink operations in the band to further ensure that harmful interference does not occur to BRS operations.
- Decline to modify Part 18 of the Commission's rules to restrict the emissions of industrial, science, and medical (ISM) devices in that band.
- Decline to relocate grandfathered broadcast auxiliary service (BAS) and Part 90 and 101 fixed service licensees.

4. In the *BRS/EBS Third Memorandum Opinion and Order*,[6] we take the following actions with respect to petitions for reconsideration filed in response to the *BRS/EBS R&O*:

- Grant petitions filed by various parties to implement a transition by Basic Trading Areas

[3] *See* Federal Communications Commission, Strategic Plan 2006-2011 at 3 (2005) (*Strategic Plan*).

[4] *Id.*

[5] The *Big LEO Order on Reconsideration* is part of the Big LEO proceeding in IB Docket No. 02-364. The *AWS 5th MO&O* is part of the Advanced Wireless Services proceeding in ET Docket No. 00-258. A list of petitioners is available in Appendix C. Unless otherwise noted references to petitions, oppositions, replies, and *ex parte* letters in n. 39-153 *infra* are contained in IB Docket No. 02-364.

[6] Unless otherwise noted references to petitions, oppositions, replies, comments, reply comments, and *ex parte* letters in n. 154-1018 *infra* are contained in WTB Docket No. 03-66.

(BTAs), rather than by Major Economic Areas (MEAs).

- Grant a petition and adopt a "first-in-time" rule for determining which entity will be a proponent.
- Make minor changes to our rules relating to Pre-Transition Data Requests in order to clarify the responsibilities of the parties and improve the administration of the transition process.
- In response to a petition, adopt two additional "safe harbors" that will be presumed to be reasonable offers for the transition from proponents.
- Grant petitions to allow licensees to self-transition after 30 months after the effective date of the amended rules in markets where a proponent does not come forward.
- Deny petitions asking the Commission to reverse its decision to require certain Multichannel Video Programming Distributors (MVPD) to obtain a waiver before opting out of the transition process.
- Grant WATCH TV's Waiver Request to permanently opt-out of the transition to the new band plan.
- Grant, in part, petitions asking that all commercial licensees, in a proponent-driven transition, reimburse the proponent a pro rata share of the cost of transitioning a BTA to the new band plan.
- On our own motion, require all licensees, except for EBS licensees, to pay their own costs if they self-transition.
- Adopt procedures for self-transitioning EBS licensees to recover costs from BRS licensees and lessees, commercial EBS licensees, and entities that lease EBS spectrum for a commercial purpose.
- Deny most petitions for reconsideration of the technical rules adopted in the *BRS/EBS R&O*, but make minor changes in response to a petition.
- Affirm our decision to allow Part 15 unlicensed operations to operate in the 2655-2690 MHz band and deny petitions asking that the Commission prohibit unlicensed operations in that band.
- Deny petitions and affirm our decision to allow two-way service prior to transition.
- Reject a petition that we clarify the educational use requirements applicable to EBS spectrum.
- Deny petitions and affirm our decision that cable television operators and ILECs may hold or lease spectrum in this band to the extent consistent with the Communications Act.
- With one exception, affirm the dismissal of applications for new EBS stations identified as mutually exclusive in the *BRS/EBS R&O*.

- Permit EBS licensees to enter into a lease with a maximum term of thirty years, subject to conditions designed to ensure that EBS licensees have a fair opportunity to re-evaluate their educational needs.

- Clarify that BRS BTA authorization holders maintain their right to apply for unassigned EBS spectrum.

5. In the *BRS/EBS Second Report and Order*, we take the following actions:

- Adopt substantial service standards for BRS and EBS licensees, and establish safe harbors similar to those used in other services.

- On our own motion, require all licensees to establish substantial service as of May 1, 2011.

- Defer accepting applications for any remaining EBS white space spectrum until the completion of incumbent-organized transitions to the new band plan.

- On our own motion, defer accepting applications for BRS spectrum recovered from MDS BTA overlay licensees until the completion of incumbent-organized transitions to the new band plan in order to consider the effects of the self-transition process advocated by commenters.

- Consistent with the majority of the comments filed in this proceeding: (1) establish a geographic service area for grandfathered E and F channel EBS licensees, and allow such licensees to modify or assign their licenses; (2) eliminate overlaps of 50 percent or less between a grandfathered EBS licensee and a BRS site-based incumbent by "splitting the football;"[7] and (3) for overlaps of more than 50%, establish a ninety-day mandatory negotiation period, followed by "splitting the football" if no agreement is reached at the end of the period.

- Consistent with the majority of the commenters, eliminate the rule that limits EBS licensees to four channels in a given geographic area.

- Accept comments supporting the elimination of the wireless cable exception to the EBS eligibility rules.

- On our own motion, alter, where possible, the regulatory fee structure for the BRS services to establish a tiered regulatory fee structure based on market size/MHz.

[7] "Splitting the football" occurs when the geographic service areas (GSAs) of two or more licensees overlap. The MDS and ITFS industry developed an informal method for handling this problem by drawing a boundary line through a "football"-shaped area where the GSAs intersect, with each licensee agreeing to limit the interference it generates across the boundary.

III. BACKGROUND

A. Big LEO Order on Reconsideration and AWS 5th MO&O

6. *Big LEO Spectrum Sharing Order*. In the *Big LEO Spectrum Sharing Order*, the Commission established a primary fixed and mobile (except aeronautical mobile) allocation in the upper five megahertz of Big LEO MSS S-band spectrum at 2495-2500 MHz.[8] The Commission stated that the resulting services would operate in those frequencies with CDMA MSS downlink operations.[9] The Commission further stated that the CDMA MSS providers would provide their services in that spectrum on an unprotected basis.[10] The Commission determined that this allocation was appropriate because the Commission was reviewing proposals to restructure the adjacent 2500-2690 MHz band, also allocated as a primary fixed and mobile (except aeronautical mobile) band.[11] The result would be the new BRS/EBS band plan at 2495-2690 MHz.[12] The Commission also stated that those bands combined could serve as suitable relocation spectrum for BRS licensees currently operating in the 2150-2160/62 MHz band.[13]

7. The Commission concluded that CDMA MSS operators could use the same spectrum as fixed and mobile operators, specifically BRS, without harmful interference because BRS operations would be more likely to occur in urban, suburban and less developed areas, whereas MSS operators would more likely serve customers in rural and underdeveloped areas.[14] To address interference concerns for CDMA MSS, the Commission stated that the BRS would be a low power service at 2496-2500 MHz.[15] The Commission also noted that MSS operators would have access to a newly-established

---

[8] *See generally Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13387-13388 ¶¶ 69-71. Big LEO satellite systems provide voice and data communication to users with handheld mobile terminals via non-geostationary satellites in Low Earth Orbit (LEO), *i.e.*, at orbital altitudes below the Van Allen Radiation Belt. The term "Big LEO" was coined to distinguish such systems, operating in frequency bands above 1 GHz, from the so-called "Little LEO" systems that provide data communications via non-geostationary satellites in frequency bands below 1 GHz. The Big LEO S-band spectrum spans the 2483.5-2500 MHz band. The *Big LEO Spectrum Sharing Order* also addresses issues in the Big LEO MSS L-band spectrum at 1610-1626.5 MHz. Reconsideration of the L-band issues is not a part of this Order and will be addressed separately at a later date. For additional background about MSS in the Big LEO bands, see Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, CC Docket No. 92-166, *Report and Order*, FCC 94-261, 9 FCC Rcd 5936 (1994) (*Big LEO Order*), *on reconsideration*, *Memorandum Opinion and Order*, FCC 96-54, 11 FCC Rcd 12861 (1996).

[9] *Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13387-13388 ¶¶ 69-71. With regard to the Big LEO systems, CDMA MSS uplinks operate in the 1610-1621.35 MHz band and CDMA MSS downlinks operate in the 2483.5-2500 MHz band. TDMA MSS uplinks and downlinks operate in the 1618.25-1626.5 MHz band.

[10] *Id.*

[11] *Id.* at 13387 ¶ 69.

[12] *See generally BRS/EBS R&O*, 19 FCC Rcd 14165.

[13] *Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13388 ¶ 71.

[14] *Id.* at 13388 ¶ 72.

[15] *Id.* at 13389 ¶ 72. The Commission also stated that strict out-of-band emissions limits would be imposed on the BRS operators at and above 2496 MHz. *Id.* at 13389 ¶ 74.

1 megahertz guard band at 2495-2496 MHz, but MSS would not receive protection in the 2495-2500 MHz band.[16] To address interference concerns for BRS, the Commission stated that the ITU-established PFD values for MSS downlinks operations in this band should sufficiently protect the BRS from harmful interference.[17] The Commission also shifted MSS ancillary terrestrial component (ATC) operations down five megahertz, from 2492.5-2498 MHz to 2487.5-2493 MHz, to ensure adequate separation between MSS ATC and BRS operations at and above 2496 MHz.[18]

8. With respect to incumbent terrestrial radio operators in the 2483.5-2500 MHz band, the Commission declined to relocate ISM devices, reasoning that BRS could operate with ISM operations present.[19] The Commission stated, however, that it would consider a relocation plan for BAS and private radio services grandfathered in that band, if necessary, after addressing the then-remaining issues concerning the relocation associated with the introduction of Advanced Wireless Services (AWS) in ET Docket No. 00-258.[20]

B. BRS/EBS 3rd MO&O and 2nd R&O

9. A full discussion of the background and history involving this band is contained in the *BRS/EBS R&O & FNPRM*.[21] Briefly, in 1963, the Commission established ITFS in the 2500-2690 MHz band,[22] envisioning that it would be used for transmission of instructional material to accredited public and private schools, colleges, and universities for the formal education of students.[23] In 1974, the Commission established MDS as a new common carrier service and allotted the 2150-2160 MHz band

---

[16] *Id. See also* 47 C.F.R. § 2.106 US391.

[17] *Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13389 ¶ 73.

[18] *Id.* at 13385-86 ¶ 66. ATC allows MSS operators to utilize their satellite spectrum terrestrially in urban areas and in buildings, where the satellite signal is weak. Big LEO Spectrum Sharing Order, 19 FCC Rcd at 13367, ¶ 24; *see generally* 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*, FCC 03-15, 18 FCC Rcd 1962 (2003) (*ATC Report and Order* and *Big LEO Spectrum Sharing Notice* as appropriate), *modified sua sponte, Order on Reconsideration*, FCC 03-162, 18 FCC Rcd 13590 (2003), *on reconsideration, Memorandum Opinion and Order and Second Order on Reconsideration*, FCC 05-30, 20 FCC Rcd 4616 (2005) (*ATC MO&O*), *further recon pending*. ATC operations are limited to specific portions of the Big LEO bands. In the L-band, ATC is allowed at 1610-1615.5 MHz and 1621.35-1626.5 MHz. *See* 47 C.F.R. § 25.149(a)(2)(iii).

[19] *Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13386 ¶ 67.

[20] *Id.*

[21] *BRS/EBS R&O* and *FNPRM*, 19 FCC Rcd at 14171-14176 ¶¶ 9-20.

[22] *See* Educational Television, Docket No. 14744, *Report and Order*, 39 FCC 846 (1963) (*MDS R&O*), *recon. denied*, 39 FCC 873 (1964) (*ETV Decision*).

[23] *See* Amendment of the Commission's Rules With Regard to the Instructional Television Fixed Service, the Multipoint Distribution Service, and the Private Operational Fixed Microwave Service; and Applications for an Experimental Station and Establishment of Multi-Channel Systems, *Report and Order*, 48 Fed. Reg. 33873, 33875 ¶ 9 (1983) (*1983 R&O*) *citing ETV Decision*, 39 FCC 846, 853 ¶ 25.

for such use.[24] The Commission anticipated that the MDS spectrum would be used for wireless cable, a common carrier service for distribution of television programming from a central location to fixed points selected by the common carrier's subscribers.[25] The Commission allotted two 6 megahertz channels (2150-2162 MHz) in fifty of the largest metropolitan areas (referred to as MDS Channel Nos. 1 and 2).[26] In the rest of the country, only 10 megahertz of spectrum was allotted to MDS in this band —namely, Channel No. 1 (2150-2156 MHz) and Channel No. 2A (2156-2160 MHz).[27]

10. In 1983, in response to the demand for additional spectrum for delivery of video entertainment programming to subscribers, the Commission re-allotted eight ITFS channels (the E and F channel blocks) and associated response channels for use by MDS.[28] At the same time, in an effort to encourage more intensive use of the spectrum and to help ITFS licensees generate needed revenue, the Commission began to relax use restrictions on ITFS licensees so that they could lease excess capacity on their facilities to commercial entities.[29] In 1991, in an effort to provide more spectrum for multichannel video operations, the Commission re-allotted three additional channels in the 2500-2690 MHz band (the H channel block) from the Private Operational-Fixed Microwave Service[30] (OFS) to MDS.[31]

---

[24] Amendment of Parts 1, 2, 21, and 43 of the Commission's Rules and Regulations to Provide for Licensing and Regulation of Common Carrier Radio Stations in the Multipoint Distribution Service, *Report and Order*, Docket No. 19493, 45 FCC 2d 616 (1974), *recon. denied*, 57 FCC 2d 301 (1975) (*1974 R&O). See also 1983 R&O,* 48 Fed. Reg. at 33873 ¶ 5. Amendment of Parts 2 and 74 of the Commission's Rules to Establish a New Class of Educational Television Service for the Transmission of Instructional and Cultural Material to Multiple Receiving Locations on Channel in the 2500-2690 MHz Frequency Band, Docket No. 14744, *Second Report and Order*, 30 FCC 2d 197 ¶ 8 (1971) (*1971 R&O).*

[25] *Id.*

[26] Amendment of Part 21.703(g), and (h) of the Commission's Rules, *Memorandum Opinion and Order*, 47 FCC 2d 957 (1970).

[27] *Id.*

[28] Amendment of Parts 2, 21, 74 and 94 of the Commission's Rules and Regulations in regard to frequency allocation to the Instructional Television Fixed Service, the Multipoint Distribution Service, and the Private Operational Fixed Microwave Service, Gen Docket No. 80-112 and CC Docket No. 80-116, *Report and Order*, 94 FCC 2d 1203 (1983) (*First Leasing Decision*). The terms MDS and MMDS are often used interchangeably.

[29] *First Leasing Decision*, 94 FCC 2d at 1203.

[30] Prior to its allocation to ITFS, the 2500-2690 MHz band was allocated to shared use by Private Operational Fixed Microwave Service (OFS) stations and international control stations. The traditional Fixed Service use of this band was primarily private microwave communications uses such as multichannel voice and data circuits. *See 1983 R&O,* 48 Fed. Reg. at 33873 ¶ 8.

[31] *1991 R&O,* 6 FCC Rcd at 6792. In the first *R&O* in this proceeding, the Commission made MDS operators eligible to use microwave frequencies in the Cable Television Relay Service (CARS). Amendment of Parts 21, 43, 74, 78 and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multi-Channel Multipoint Distribution Service, Instructional-Television Fixed Service, and Cable Television Relay Service, *Report and Order*, 5 FCC Rcd 6411, 6423 (1990) (*1990 R&O*). CARS is primarily a service for carrying video. Amendment of Eligibility Requirement in Part 78 Regarding 12 GHz Cable Television Relay Service, *Report and Order*, 17 FCC Rcd 9930, 9945-6 (2002) (*CARS R&O*). ITFS operators are currently not eligible for CARS licenses, except in very limited circumstances. 47 C.F.R. § 78.13(e).

11. The Commission subsequently took a number of steps to increase the technical flexibility afforded to both ITFS and MDS licensees in the 2500-2690 MHz band. In 1993, the Commission granted ITFS licensees flexibility to use channel loading to shift their required educational programming onto a subset of their authorized number of channels.[32] In 1996, the Commission permitted MDS and ITFS licensees to employ digital technologies,[33] and in 1998, it expanded the existing allocation for one-way video service to allow MDS and ITFS licensees to construct digital two-way systems capable of providing high-speed, high-capacity broadband service, including two-way Internet service via cellularized communication systems.[34] Finally, in 2001, the Commission added a mobile allocation to the 2500-2690 MHz band (excluding aeronautical mobile) to make it potentially available for advanced mobile wireless services, including IMT-2000 and future generations of wireless systems.[35]

12. On October 7, 2002, the Coalition, consisting of the Wireless Communications Association, International (WCA), the Catholic Television Network (CTN), and the National ITFS Association (NIA), submitted a paper entitled "A Proposal for Revising the MDS and ITFS Regulatory Regime" ("Coalition Proposal" or "White Paper"), which recommended fundamentally changing the rules governing the 2500-2690 MHz band.[36] On April 2, 2003, the Commission released the *Notice of Proposed Rule Making* (*NPRM*) in this proceeding, seeking comment on the Coalition Proposal as well as other potential alternatives for restructuring the 2500-2690 MHz band.[37] In addition to the Coalition's

[32] For example, an ITFS licensee could move all of its ITFS programming on to one of its four channels and lease the remaining three channels on a twenty-four-hour basis to a wireless cable operator. Amendment of Part 74 of the Commission's Rules Governing Use of the Frequencies in the Instructional Television Fixed Service, MM Docket 93-106, *Report and Order*, 9 FCC Rcd 3360 ¶ 2 (1994) (*1994 R&O*). *See also* 47 C.F.R. § 74.931(e)(9).

[33] *See* Use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations, *Declaratory Ruling and Order*, 11 FCC Rcd 18839 (1996) (*Digital Modulation Declaratory Ruling and Order*).

[34] Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions, MM Docket No. 97-217, *Report and Order on Further Reconsideration and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 14566 (2000) (*Two-Way FNPRM*).

[35] *See* Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems, ET Docket No. 00-258, *First Report and Order and Memorandum Opinion and Order*, 16 FCC Rcd 17222 (2001) (*3G R&O*).

[36] *See generally* A Proposal for Revising the MDS and ITFS Regulatory Regime, submitted by the Wireless Communications Association International, Inc. (WCA), the National ITFS Association (NIA) and the Catholic Television Network (CTN), RM-10586 (filed Oct. 7, 2002) (Coalition Proposal or White Paper). WCA is the trade association of the wireless broadband industry. NIA is a non-profit, professional organization of ITFS licensees, applicants and others interested in the ITFS. CTN is an association of Roman Catholic archdioceses and dioceses that operate many of the largest parochial school systems in the United States. These entities represent that the proposals contained in the paper reflect a consensus among the organizations concerning rule changes for the 2500-2690 MHz band.

[37] *See* 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; Part 1 of the Commission's Rules - Further Competitive Bidding Procedures; 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; Amendment of Parts 21 and 74 of the Commission's Rules With (continued....)

proposal, the Commission also sought comment on ownership and eligibility issues, transition timetables, and additional engineering issues as well.

13. On July 29, 2004, the Commission released the *BRS/EBS R&O & FNPRM*. In the *BRS/EBS R&O*, the Commission adopted a band plan that restructured the 2500-2690 MHz band into upper and lower-band segments for low-power operations (UBS and LBS, respectively), and a mid-band segment (MBS) for high-power operations, in order to reduce the likelihood of interference caused by incompatible uses. The Commission also designated the 2495-2500 MHz band for use in connection with the 2500-2690 MHz band.[38] Through the adoption of the new band plan, the Commission provided incentives for the development of low-power cellularized broadband use and, accordingly, renamed MDS and ITFS as the "Broadband Radio Service" and "Educational Broadband Service," respectively, to more accurately describe the kinds of the services anticipated in this band.

14. In order to facilitate the transition to the new band plan, the *BRS/EBS R&O* adopted a market-oriented, transition mechanism that enables incumbent licensees to develop regional plans for moving to new spectrum assignments in the restructured band plan. Under this mechanism, licensees have a three-year period during which they can initiate the transition process in their regional area and negotiate a transition plan with other regional licensees. Transition plans must conform to certain safeguards to ensure a smooth transition and equitable treatment of incumbents.

15. The *BRS/EBS R&O* also adopted service rules that give licensees increased flexibility, reduce administrative burdens on both licensees and the Commission, and promote regulatory parity. Specifically, the Commission implemented geographic area licensing for all licensees in the band, consolidated licensing and service rules for EBS and BRS in Part 27, allowed spectrum leasing for BRS and EBS under our secondary markets spectrum leasing policies and procedures, and provided licensees with the flexibility to employ the technologies of their choice in the band. In addition, the Commission applied the Part 1 Wireless Telecommunications Bureau rules to the BRS/EBS spectrum, dismissed pending mutually exclusive applications for new ITFS stations, and took other actions to streamline the rules and eliminate unnecessary regulatory burdens.

16. With respect to eligibility to hold licenses in 2495-2690 MHz band, the Commission retained restrictions on the use of EBS licenses in continued furtherance of the educational objectives that led to the establishment of ITFS. Also, the Commission removed all non-statutory eligibility restrictions applicable to cable and digital subscriber line (DSL) operators for the BRS and thus permitted these operators to provide non-video services like broadband internet access.

17. In addition, the *BRS/EBS R&O* resolved certain technical issues as follows: set the signal strength limits for the low-power bands at the boundaries of the geographic service areas to 47 dBμV/m; restricted the transmitter output power of response stations to 2.0 watts; modified emission limits for stations that would operate on the LBS and UBS channels; and refrained from allowing high-power unlicensed operations in the 2500-2690 MHz band, but allowed unlicensed operation under our existing Part 15 rules in the 2655-2690 MHz band.

(Continued from previous page)
Regard to Licensing in the Multipoint Distribution Service and in the Instructional Television Fixed Service for the Gulf of Mexico; WT Docket Nos. 03-66, 03-67, 02-68, MM Docket No. 97-217, *Notice of Proposed Rulemaking and Memorandum Opinion and Order*, 18 FCC Rcd 6722 (2003) (*NPRM*).

[38] *See supra* ¶ 7 (citing *Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13387-13388 ¶¶ 69-71).

18. In the *BRS/EBS Further Notice of Proposed Rulemaking* (*FNPRM*), the Commission sought comment on alternative methods to transition licensees to the extent that licensee-negotiated transitions do not occur within the three-year transition period. Among other methods, we sought comment on a process whereby the Commission would offer incumbent licensees modified non-renewable licenses that would become secondary to new licenses to be assigned pursuant to the new band plan. Under this process, the Commission also would offer incumbent licensees tradable bidding offset credits that could be used to obtain new licenses, and that would provide spectrum access valued comparably to that provided by the incumbent's existing license. In addition to alternate transition methods, we also sought further comment on the following issues: the Gulf of Mexico service area; performance requirements for licensees in the band; grandfathered ITFS stations on the E and F channel groups; limitations on the holdings of ITFS stations; the "wireless cable" exception to the ITFS eligibility rules; regulatory fees; methods of streamlining our review of transactions involving these services; and continuing our review of rules relating to these services.

19. Petitions for reconsideration and comments were due on January 10, 2005. We received 33 petitions for reconsideration of the *BRS/EBS R&O* and 30 comments in response to the *FNPRM*. Reply comments were due on February 8, 2005 and we received 27 reply comments.

IV. DISCUSSION

A. Big LEO Order on Reconsideration and AWS 5th MO&O

20. In this Section, we address issues related to the BRS, MSS, BAS, ISM and Part 90 and Part 101 operators sharing spectrum in the 2495-2500 MHz band.

1. Relocation Policy and BRS Operators

21. *Background.* In the *AWS* proceeding (ET Docket No. 00-258), the Commission decided to relocate BRS operators from the 2150-2160/62 MHz band so that AWS entrants could move into that spectrum. While the Commission determined that it would apply the *Emerging Technologies* relocation policy of requiring comparable facilities to BRS operators in this band, it also sought comment generally on the issues surrounding the relocation of the BRS operators.[39] The Commission noted, however, that its "relocation policies do not dictate that systems be relocated to spectrum-based facilities or even to the same amount of spectrum as they currently use, only that comparable facilities be provided."[40] In the *Big LEO Spectrum Sharing Order,* the Commission determined that the 2495-2500 MHz band, combined with the restructuring of BRS/EBS spectrum in the 2500-2690 MHz band, would serve as suitable

[39] *See* Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems, ET Docket No. 00-258, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, FCC 03-16, 18 FCC Rcd 2223, 2256, ¶ 71 (2003) (*AWS Third Report and Order*). We note that the Commission has sought comment on the specific relocation procedures applicable to BRS operations in the 2150-2160/62 MHz band in a pending rulemaking proceeding in the *AWS* docket. *See* Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems, ET Docket No. 00-258, *Eighth Report and Order and Fifth Notice of Proposed Rule Making,* FCC 05-172, 20 FCC Rcd 15866 (2005) (*AWS 8th R&O and 5th NPRM*).

[40] *AWS Third Report and Order*, 18 FCC Rcd at 2256, ¶ 72.

replacement spectrum for BRS providers that currently operate at 2150-2160/62 MHz.[41]

22. *Petitions.* WCA, Nextel, Sprint, BellSouth, and the BRS Advocacy Group claim that the Commission's choice of the 2495-2500 MHz band as replacement spectrum for BRS licensees that currently operate in the 2150-2160/62 MHz band contravenes its established relocation policy that incumbent licensees who are relocated to replacement spectrum are "no worse off" after relocation.[42] WCA claims that BRS operators would be "worse off" after relocation because BRS licensees do not currently share their spectrum with MSS, BAS, ISM and Part 90 and Part 101 operators and are thus "free of the sorts of interference risks" they would face when sharing their replacement spectrum with these users.[43] Nextel and Sprint contend that requiring BRS operators, who obtained licenses at auction "with rights and expectations as to their future use and value,"[44] to share their replacement spectrum with other services that may cause interference to BRS operations, violates the "well-established principle" that licensees "are entitled to receive comparable replacement spectrum when the Commission relocates them."[45] BellSouth and the BRS Advocacy Group argue that adopting Globalstar's proposals to remedy interference concerns by, among other things, limiting BRS operations to the top 35 metropolitan statistical areas (MSAs) "would also contravene Commission policies designed to ensure that incumbent licensees forced to relocate to replacement spectrum are no worse off than they were before."[46]

23. *Discussion.* In the *Emerging Technologies* proceeding,[47] the Commission recognized

---

[41] *Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13387-13388, ¶¶ 69-71. The *BRS/EBS R&O* further discusses the benefits of restructuring the 2500-2690 MHz band into a new 2495-2690 MHz BRS/EBS band. *See generally BRS/EBS R&O*, 19 FCC Rcd 14165.

[42] *See, e.g.*, Nextel Petition at 3, n.7; Sprint Petition at 3; WCA Petition at 4-5; BellSouth Opposition at 5-7; BRS Advocacy Group Opposition at 6-8; Nextel Opposition at 5; Sprint Opposition at 6, n.15; WCA Opposition at 2, 5-7; Nextel Reply at 7; Sprint Reply at 5, n.12; WCA Reply at n.15.

[43] *See* WCA Petition at 4-5.

[44] *See* Sprint Petition at 3; *see also* Nextel Petition at 3, n.7.

[45] *See* Nextel Petition at 3, n.7. Nextel also claims that "revoking rights previously granted to licensees is fundamentally unfair to the dislocated BRS auction winners and subsequent purchasers for value of those rights because it ignores the licensees' reliance interest in the Commission's representations about the spectrum sold." *Id.* We note that the case cited by Nextel for support of this contention addresses a challenge, which the court ultimately rejected, of changes made by the Commission to the financial terms applicable to companies that had purchased licenses at auction and is therefore irrelevant to the case at hand. Nextel further claims that "denying the dislocated licensees comparable replacement spectrum violates the licensee's constitutional protections against uncompensated government takings as either a permanent physical occupation of their property, or a regulatory taking, or both." *Id.* We disagree. The Commission has provided relocating BRS licensees with replacement spectrum that is suitable for the provision of comparable facilities.

[46] *See* BellSouth Opposition at 5-6; BRS Advocacy Group Opposition at 7-8. Globalstar's proposed limitations on BRS operations are discussed in detail *infra* ¶ 28.

[47] *See* Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, *ET Docket No. 92-9, Notice of Proposed Rulemaking,* FCC 92-20, 7 FCC Rcd 1542 (1992) (*Emerging Technologies Notice*); First Report and Order and Third Notice of Proposed Rulemaking, FCC 92-437, 7 FCC Rcd 6886 (1992); Second Report and Order, FCC 93-350, 8 FCC Rcd 6495 (1993); *Third Report and Order and Memorandum Opinion and Order*, FCC 93-351, 8 FCC Rcd 6589 (1993) (*Emerging Technologies Third R&O*); Memorandum (continued....)

that the establishment of emerging technologies bands may necessitate the relocation of significant numbers of existing users and outlined several factors to consider when determining whether replacement spectrum was suitable.[48] These factors include: (1) the cost of equipment – the spectrum chosen should be able to accommodate available state-of-the-art equipment; (2) the amount of spectrum – the spectrum should be sufficient to allow substantial development and economies of scale; (3) the feasibility of relocation – existing licensees must be able to relocate with minimal cost and disruption of service to consumers; (4) a preference for non-government spectrum; and (5) compatibility with international spectrum developments.[49] Although the Commission has identified replacement spectrum that is suited for the services to be relocated on several occasions, licensees may be relocated to any band appropriate for its use, taking into account the allocation and designated uses of the band. The Commission also established a relocation policy in which incumbent service providers with primary status would receive comparable facilities if they are involuntarily relocated to new spectrum.[50] Under this policy, incumbents must be provided with replacement facilities that allow them to maintain the same service in terms of: (1) throughput – the amount of information transferred within the system in a given amount of time; (2) reliability – the degree to which information is transferred accurately and dependably within the system; and (3) operating costs – the cost to operate and maintain the system.[51] Thus, the Commission crafted the comparable facilities requirement to ensure that incumbents are "no worse off" than they would be if relocation were not required – not to guarantee incumbents superior systems at the expense of new entrants or unencumbered replacement spectrum. Indeed, the Commission's policy recognizes that in some cases comparable facilities may be satisfied with a non-spectrum solution for relocating a licensee.[52]

24. We disagree with the various petitioners' claims that our choice of replacement spectrum would make BRS incumbents "worse off" than before relocation. Based on the factors described above, the Commission has chosen non-government replacement spectrum that is compatible with international

(Continued from previous page)
Opinion and Order, FCC 94-60, 9 FCC Rcd 1943 (1994); *Second Memorandum Opinion and Order*, FCC 94-303, 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"). *See also Teledesic, LLC v. FCC*, 275 F.3d 75 (D.C. Cir. 2001) (affirming modified relocation scheme for new satellite entrants to the 17.7 – 19.7 GHz band). *See also* Amendment to the Commission's Rules Regarding a Plan for Sharing the Costs of Microwave Relocation, WT Docket No. 95-157, *First Report and Order and Further Notice of Proposed Rulemaking*, FCC 96-196, 11 FCC Rcd 8825 (1996) (*Microwave Cost Sharing First R&O and FNPRM*); *Second Report and Order*, FCC 97-48, 12 FCC Rcd 2705 (1997) (collectively, "*Microwave Cost Sharing* proceeding").

[48] *Emerging Technologies Notice*, 7 FCC Rcd at 1543 ¶ 9.

[49] *Id.* at 1543 ¶ 10. The Commission's staff conducted a study to examine the possibility of creating emerging technologies bands with these considerations in mind. *See Creating New Technology Bands for Emerging Telecommunications Technology*, OET/TS 92-1 (January 1992).

[50] *Emerging Technologies Third R&O*, 8 FCC Rcd at 6591, 6603 ¶¶ 5, 36.

[51] *See Microwave Cost Sharing First R&O and FNPRM*, 11 FCC Rcd at 8840-8844 ¶¶ 27-34. *See also* 47 C.F.R. §§ 101.73, 101.75, 101.91.

[52] *See, e.g., Microwave Cost Sharing First R&O and FNPRM*, 11 FCC Rcd at 8843 ¶ 33; *Emerging Technologies First R&O and Third NPRM*, 7 FCC Rcd at 6889 ¶ 19 (recognizing, in the context of relocation of 2 GHz fixed microwave incumbents by PCS licensees, that fiber optics and satellites could, in some cases, allow for the provision of comparable facilities).

spectrum developments, and would accommodate available state-of-the-art equipment. This spectrum is also sufficient to allow substantial development and economies of scale. As the Commission noted in the *BRS/EBS R&O*, the optimal location for relocated BRS licensees currently operating in the 2150-2160/62 MHz band is in the 2.5 GHz BRS band (2495-2500 MHz band combined with the restructured 2500-2690 MHz band) because these licensees would be integrated into contiguous spectrum for other BRS operations.[53] Further, the new licensing rules adopted by the Commission for the BRS spectrum in the 2.5 GHz band provide BRS licensees with additional flexibility (*e.g.*, the transition to geographic area licensing and the ability to pair BRS Channels 1 and 2 in an FDD system).[54] With respect to the remaining factor, the Commission has decided that relocation of existing users from the 2495-2500 MHz band is not necessary because, as discussed in the sections below, it finds that spectrum sharing between BRS and MSS operations, as well as the existing users in the band, is feasible.

25. We also disagree with WCA's contention that relocating incumbents are "worse off" because they are required to share their replacement spectrum with other users. As noted above, the Commission's relocation policies require that relocating incumbents receive replacement spectrum that is suitable for comparable facilities to maintain service to customers, not that they receive equivalent or unencumbered replacement spectrum. With respect to Nextel and Sprint's arguments that the Commission is altering the rights and expectations of BRS operators that obtained their licenses at auction, we note that the Commission is not precluded from regulating or reclaiming spectrum licenses that were auctioned.[55] Finally, our denial of Globalstar's proposal to limit BRS operations to the top 35 MSAs, as discussed below, addresses the concerns raised by BellSouth and the BRS Advocacy group.

26. Accordingly, we continue to believe that the 2495-2500 MHz band, combined with the restructured 2500-2690 MHz band, is suitable replacement spectrum for the provision of comparable facilities to accommodate BRS operations that currently operate in the 2150-2160/62 MHz band and, therefore, deny the petitions requesting reconsideration of this issue.

2. MSS and BRS Operations in the 2496-2500 MHz Band

27. *BRS Petitioners.* Petitioners WCA, Nextel and Sprint, (collectively referred to as BRS Petitioners) request the Commission to remove the co-primary allocation for Big LEO MSS in the 2496-2500 MHz band, claiming that the two services cannot operate on a co-channel, co-coverage basis without harmful interference occurring.[56] Although the BRS Petitioners acknowledge the Commission's

[53] *BRS/EBS R&O*, 19 FCC Rcd at 14179 ¶ 27.

[54] *See generally BRS/EBS R&O*, 19 FCC Rcd 14165. Frequency Division Duplex (FDD) provides simultaneous communications between two devices through the use of two different bands. The forward band refers to the spectrum used by base stations and the reverse band refers to the spectrum used by the subscriber. In FDD systems, frequency separation between the forward band and the reverse band remains constant among each subscriber-base station communication. *BRS/EBS R&O,* 19 FCC Rcd at 14190 n.71.

[55] 47 U.S.C. § 309(j)(6)(C). Section 309(j)(6)(C) of the Communications Act provides that "[n]othing in this subsection or in the use of competitive bidding shall diminish the authority of the Commission under other provisions of this Act to regulate or reclaim spectrum licenses."

[56] Nextel Petition at 13; Sprint Petition at 1; WCA Petition at 5-11; Nextel Opposition at 10, 11; Sprint Opposition at 6. *See also* BellSouth Opposition at 5; BRS Rural Advocacy Group Opposition at 2; *Ex Parte* Letter from Paul Sinderbrand, Counsel for WCA, to Marlene H. Dortch, Federal Communications Commission (dated October 19, 2005); *Ex Parte* Letter from Paul Sinderbrand, Counsel for WCA, to Marlene H. Dortch, Federal Communications Commission (dated October 6, 2005); *Ex Parte* Letter from Paul Sinderbrand, Counsel for WCA, to Marlene H. (continued....)

decision not to require BRS to protect MSS operations in this band, they allege that the Commission fails to protect BRS from MSS operations. In particular, the BRS Petitioners allege that the Commission incorrectly concluded that BRS could rely on the MSS PFD limits for interference protection because the PFD limits are not hard limits, but merely criteria triggering coordination, and thus are not required limits for MSS systems;[57] the PFD limits are designed to protect only analog fixed, not mobile or digital, operations; and the Commission previously rejected sharing between MSS and BRS in the adjacent 2.5 GHz band.[58] WCA claims that Globalstar, the sole MSS operator in that spectrum, cannot object to WCA's proposal because it would only lose four megahertz of spectrum (as compared to potentially 11 megahertz as proposed in the *Big LEO Spectrum Sharing Notice*).[59]

28. *Globalstar Petition.* In its Petition, Globalstar claims that the Commission must impose additional restrictions on BRS in order for Globalstar to use the 2496-2500 MHz band in rural areas while BRS licensees use that band in urban areas.[60] In particular, Globalstar argues that the Commission should restrict: (1) BRS operations to the top 35 metropolitan statistical areas (MSAs);[61] (2) BRS base station power to an effective isotropic radiated power (EIRP) of 600 watts; and (3) out-of-band emissions to a total of -209 dBW/Hz or less, 99 percent of the time, outside the boundaries of the 35 MSAs.[62] In addition, Globalstar claims that the Commission incorrectly concluded that BRS operations are more likely to occur in urban areas, noting that BRS-1 operators are licensed on a nationwide basis.[63] Globalstar further argues that the EIRP limits adopted in the *Big LEO Spectrum Sharing Order*, 2000 watts for base stations and 2 watts for mobile terminals, would "wipe out MSS downlink operations,

(Continued from previous page)
Dortch, Federal Communications Commission (dated September 26, 2005) (arguing that the Commission should eliminate the co-primary allocation for MSS).

[57] BRS Petitioners refer to the PFD limits set forth in Annex 2.1.2.3.1 of Resolution 46 (WRC-97) of the ITU Radio Regulations. *See* Sprint Petition at 4; WCA Petition at 7-8. The provisions of Resolution 46 (WRC-97) are now specified in the ITU Radio Regulations at Appendix 5, Annex 1 (ITU-RR App. 5, Annex 1).

[58] *See* Nextel Petition at 5-8; WCA Petition at 10. WCA also asserts that an ITU-R Study Group 8 report (ITU-R M.2041) concluded that co-frequency sharing between MSS and IMT-2000 terrestrial services is not feasible in the same geographic area. *See* WCA Petition at 11. BRS Petitioners argue that the Commission has found spectrum sharing between satellite and terrestrial services not to be feasible in other cases, for example when it allowed MSS operators to provide ATC service. *See* Nextel Petition at 5-8; WCA Petition at 10-11.

[59] WCA Petition at 12-13; WCA Opposition at 5-6. *See also* BellSouth Opposition at 7-8; Sprint Petition at 5 (claiming that "[s]uch action . . . would not prejudice any MSS party"). WCA claims that its proposal is consistent with the 1.4 to 1 ratio of spectrum needed to ensure efficient spectrum use by Globalstar and questions Globalstar's need for even 11.5 megahertz of spectrum in the S-band. WCA Petition at 13, n.24; *accord* Sprint Opposition at 7.

[60] Globalstar Petition at 12.

[61] According to Globalstar, a BRS user terminal needs to be restricted by geographic location because, to otherwise avoid interference to MSS, a BRS user terminal operating within 1 kilometer of a Globalstar customer would need to be limited to 0.18 mw of power, and no technology is capable of operating at this low power level. Globalstar Petition, Technical Appendix.

[62] Globalstar Petition at 12.

[63] Globalstar Petition at 11. *See also* BRS Rural Advocacy Group Opposition at 6 (noting Globalstar's comments and arguing that the Commission failed to realize the extent to which BRS-1 licensees operate in rural areas).

either satellite or ATC, for a radius of 30 kilometers."[64]

29. *Discussion.* We affirm our decision in the *Big LEO Spectrum Sharing Order* that both MSS and BRS operators can operate in the 2496-2500 MHz band on a co-primary basis, and that MSS shall not receive protection from fixed and mobile (except aeronautical mobile) services in the 2495-2500 MHz band.[65] As a result, we reject the BRS petitioners' request that we remove the co-primary allocation for Big LEO MSS in the 2496-2500 MHz band and Globalstar's request that we restrict BRS operations in this band to certain markets. We conclude that the *Big LEO Spectrum Sharing Order* struck a more appropriate balance between the two services. Under the decision in the *Big LEO Spectrum Sharing Order,* MSS and BRS both will be able to operate in the band. The MSS-BRS sharing obligations, however, are complementary, not identical. For example, we established a 1-megahertz guard band at 2495-2496 MHz to separate BRS operations from MSS, and imposed strict out-of-band emission limits on BRS to protect MSS operations below 2495 MHz.[66] As we noted in the *Big LEO Spectrum Sharing Order*, Globalstar operations below 2495 MHz will be protected from interference as a consequence of these decisions. Further, although MSS retains co-primary status as a direct entry in the Table of Allocations in the 2495-2500 MHz band, MSS must accept interference from BRS pursuant to footnote US391. As a consequence, most MSS operations will likely occur below 2495 MHz where they are entitled to protection. In addition, MSS operators will have more success utilizing the 2495-2500 MHz band without receiving harmful interference in areas with little or no BRS deployment. On the other hand, BRS deployment nationwide will not be hindered by a need to protect MSS operations above 2495 MHz, and BRS operations will be protected from MSS interference by PFD limits, as we discuss below.[67] Thus, we do not see the need to modify the MSS allocation in the band as the BRS Petitioners request.[68] We also reject Globalstar's proposal to significantly limit the number of BRS service areas nationwide, because it is inconsistent with the Commission's decision to relocate BRS operations from the 2.1 GHz band to the 2496-2502 MHz band.

30. We note that it may be as long as five years before BRS operations are relocated to this band,[69] and so MSS may operate as it always has during that time. Once BRS operations commence, MSS will have notice of the discrete geographic areas of BRS operation, because Section 27.1235

---

[64] Globalstar Petition at 12.

[65] *See* 47 C.F.R. § 2.106 US391.

[66] *See Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13388-13389 ¶¶ 72, 74.

[67] As a related matter, we disagree with those petitioners claiming that the Commission incorrectly concluded that BRS would more likely operate in urban areas. *See* Globalstar Petition at 11. *See also* BRS Rural Advocacy Group Opposition at 6 (noting Globalstar's comments and arguing that the Commission failed to realize the extent to which BRS Channel No. 1 licensees operate in rural areas). The Commission did not preclude the possibility of BRS operations in rural areas, as some commenters seem to suggest, nor did it imply that BRS licensees may not operate nationwide. The Commission took into account BRS operations that would be operating near Globalstar (*i.e.*, in rural or less developed areas) when it explained that the MSS PFD limits should sufficiently protect BRS operations. *See Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13388 ¶ 73.

[68] WCA expresses concern about the lack of procedures for resolving harmful interference if it occurs. WCA Petition at 6. To address this concern, we encourage each party to have an available point of contact so that any interference complaints could be handled expeditiously.

[69] *See AWS 8th R&O and 5th NPRM*, 20 FCC Rcd at 15879-15880 ¶ 24.

requires BRS operators to file a notice identifying the licensees that have transitioned to the band and the specific frequencies that they are using.[70] We anticipate that, once those BRS operation areas are identified, MSS will utilize primarily the spectrum below 2495 MHz, where it is entitled to interference protection, in delivering service to those areas, and use the 2495-2500 MHz band to deliver service to areas where BRS is not yet operating. Once BRS becomes ubiquitous in the 2496-2502 MHz band, we expect MSS to limit their PFD, as described below, in accessing the 2496-2500 MHz band.

31. When BRS and MSS are both operating in the same geographic area, sharing spectrum, through engineering solutions, should be feasible. In particular, we adopt PFD limits for MSS systems operating in the 2496-2500 MHz band, consistent with the PFD coordination threshold values set forth in ITU Radio Regulations, Appendix 5, Annex 1 (ITU-RR App. 5, Annex 1). ITU-RR App. 5, Annex 1 includes coordination threshold values of PFD for non-geostationary satellite orbit (NGSO) space stations and degradation of performance values for terrestrial systems and addresses both analog and digital fixed use in the 2496-2500 MHz band.[71] Globalstar has the capability to control its PFD in the 2496-2500 MHz band by limiting the number of users on a particular channel in a given geographical region.[72] At the same time, BRS operators could design their networks to accept interference-to-noise ratios higher than they might find in a non-shared environment, which should compensate for the effect of low-level, external noise sources, thereby yielding systems with the same throughput, availability and operating costs as currently exists in the 2150-2156 MHz band. Although we recognize, as the BRS Petitioners note, that the PFD coordination threshold values in ITU-RR App. 5, Annex 1 do not address all potential interference cases between MSS and BRS, such as mobile terrestrial use, the lower gains of antennas associated with mobile handheld units make them less vulnerable to the emissions of the satellite systems than antennas of fixed systems, and thus, the ITU-RR App. 5, Annex 1 PFD coordination threshold values should protect mobile terrestrial uses as well. If MSS operators intend to operate at power levels that exceed the newly-adopted PFD limits, or if actual operations routinely exceed the newly-adopted PFD limits, we require them to receive approval from each operational BRS system in the region in which the PFD limits are exceeded. Furthermore, we emphasize that, if the MSS footprint overlaps multiple BRS areas, later arriving BRS operators are not obligated to accept higher

[70] *See* 47 C.F.R. § 27.1235.

[71] Specifically, ITU-RR App. 5, Annex 1, NOTE 7, states:

> The pfd values specified for the band 2483.5-2500 MHz provide full protection for analogue radio-relay systems using the sharing criteria established by Recommendation ITU-R SF.357, for operation with multiple non-GSO MSS systems employing code division multiple access techniques. The pfd values specified will not provide full protection for existing digital fixed systems in all cases. However, these pfd values are considered to provide adequate protection for digital fixed systems designed to operate in this band, where high-power industrial, scientific and medical equipment and possible low-power applications are expected to produce a relatively high interference environment.

[72] According to Globalstar, the power-density transmitted from each of the satellite's downlink antennas is dependent on the number of CDMA MSS users operating in the geographical region served by that antenna beam. *See generally* Application of L/Q Licensee, Inc. for Modification to Order and Authorization for Globalstar, File Nos. 88-SAT-WAIV-96 and 90-SAT-ML-96 (March 7, 1996). Therefore, as Globalstar stated in the ATC proceeding, the PFD in selected regions of the country may be dynamically controlled by the Globalstar operations center. *See Ex Parte* Letter in IB Docket No. 01-185 from William Wallace, Counsel for Globalstar L.P., to Marlene H. Dortch, Federal Communications Commission (dated July 1, 2002), Attachment at 18, 22-23.

PFD limits previously approved by an adjacent BRS operator.[73]

32. We are not persuaded by WCA's study which purports to demonstrate that the PFD coordination threshold values for CDMA MSS in the downlink band would not sufficiently protect the BRS operators in all cases.[74] WCA's technical analysis does not reflect the actual operating conditions of Globalstar's satellite system.[75] WCA's analysis assumes that MSS satellite downlinks are transmitting at the maximum PFD level at all times, at all possible elevation angles. However, Globalstar's satellites, typical of most NGSO satellite systems, can not meet the theoretically maximum PFD coordination threshold values at all possible angles of elevation. WCA's analysis also assumes that the downlink transmissions are unmoving and fixed in space. Given the mobile nature of NGSO satellites, however, the position of the satellite will change continuously as will the satellite antenna gains towards the terrestrial receivers and the terrestrial antenna gain towards the satellites. A more persuasive analysis would have accounted for the relative motion of the satellites with respect to the terrestrial systems and would have been based on the percent of time that the interference to noise ratio or signal to noise plus interference ratio varies at the terrestrial receiver. Further, once such information is known, the BRS licensees could determine the percentage of time, if any, that the satellite PFD would exceed a level that could be tolerated by BRS receivers without causing operational degradations. In addition, as discussed above, manufacturers can design BRS equipment such that BRS can reliably operate under the known PFD levels. WCA's analysis is also inconsistent with the analysis used by the international community.[76] In analyzing the impact of MSS PFD levels on terrestrial facilities, the ITU adopted an in-depth statistical evaluation that utilized a "degradation of performance" statistical analysis, which takes the factors discussed above into account when analyzing the interaction of an NGSO satellite constellation with FS receivers. This statistical analysis resulted in ITU-RR App. 5, Annex 1.[77]

---

[73] *See* 47 C.F.R. §§ 25.208(v); 25.213(b) in Appendix A.

[74] *See* WCA Petition, Attachment A.

[75] We also note that some of the "antennas" analyzed by WCA are not physically realizable, and that other WCA analyses have, in fact, used different definitions of interference than used in the current Reconsideration Petition. *Compare Ex Parte* Letter from Andrew Kreig, President of WCA, to Marlene H. Dortch, Federal Communications Commission (dated July 28, 2003), Attachment at 3 (using an increase in receiver noise of 1 dB, which is equivalent to an interference-to-noise ratio of -5.9 dB) *with* WCA Petition, Attachment A, Declaration of Harry W. Perlow (using an interference-to-noise ratio of -10 dB). WCA fails to consider the constantly changing polarization of Globalstar's system, which accordingly corresponds to a lower time-average signal at the output terminals of any BRS antenna than exists in WCA's model. In effect, WCA's model of co-planar polarization between MSS and BRS systems reflects a technically impossible scenario in which BRS antennas would have to constantly rotate while tilting in synchronization with the movement of an MSS satellite.

[76] *See supra* ¶ 31 (citing ITU RR App. 5, Annex 1).

[77] We note that an ITU Working Party 8F Report, which analyzes geostationary satellite orbit satellites interacting with IMT2000 terrestrial components, has been submitted as part of an *ex parte* letter filed on behalf of Sprint Nextel. *See Ex Parte* Letter from Trey Hanbury, Counsel for Sprint Nextel, to Marlene H. Dortch, Federal Communications Commission (dated September 15, 2005). In modeling the satellite/base station interaction in that report, the satellite is assumed to be continuously visible at a 10 degree elevation to the base station. Because Globalstar satellites are NGSO, their satellites will be seen at continuously varying elevation angles. Due to the dynamic nature of NGSO satellites, we find the analysis in this report does not apply to the current situation and, therefore, the results of the study are not directly applicable to the Globalstar/BRS sharing situation. Further, we note that the PFD limits that we have adopted are based upon the WRC-approved International Radio Regulations (continued....)

33. We disagree with the BRS Petitioners contention that, because the Commission has declined to designate the same spectrum for both MSS and terrestrial services in prior decisions, the Commission's overall spectrum policy is that MSS and terrestrial services cannot utilize the same spectrum.[78] The Commission determines whether two services may operate in the same spectrum on a case-by-case basis.[79] We acknowledge that the Commission previously denied a request to add a co-primary allocation for MSS in the 2500-2520 MHz (space-to-Earth) and 2670-2690 MHz (Earth-to-space) bands where BRS currently operates because, at that time, we determined that such sharing would present technical challenges and "that MSS has sufficient spectrum without those band segments."[80] With respect to the 2496-2500 MHz band, for which the Commission has adopted a sharing plan to address the technical challenges associated with such use, we note that MSS must accept interference from the fixed and mobile services that the BRS is anticipated to deploy in the band and will likely take this into account when determining how to most efficiently deploy its services. Thus, the Commission's decision for this band is sufficiently different from the allocation sought previously for the 2.5 GHz band. As for the BRS Petitioners' claims that the MSS ATC decision provides further evidence that MSS and terrestrial services cannot share spectrum, we disagree that the Commission's decision in that proceeding should govern our decision here. In the MSS ATC proceeding, MSS licensees wanted to dynamically reassign spectrum for use on either satellite or ATC systems as needed and, in this context, the Commission concluded that sharing between separately-licensed MSS and terrestrial networks was not practical.[81] In this proceeding, we have crafted rules that allow MSS and terrestrial licensees to operate networks that are separate and distinct from each other.

34. Finally, we reject Globalstar's proposals to reduce BRS power limits and out-of-band emissions so that MSS can use the 2496-2500 MHz band without suffering harmful interference. Globalstar's proposed limitations would significantly restrict BRS operations. For example, Globalstar's proposal to limit BRS base station power to 600 watts would reduce their power to 5 dB below the designated Commission 2,000 watt power limit. In addition, although that proposal also would reduce the area in which Globalstar's MSS customers could receive interference, the proposal could also significantly reduce the BRS' coverage area. We also note that Globalstar's proposal to establish an emission limit of -209 dBW/Hz at the boundary of the MSA is 13.5 dB lower than the Commission-imposed co-channel limit of 47 dBμV/m.[82] In essence, the effect of Globalstar's proposals would be to negate footnote US391, which states that MSS does not receive protection from fixed and mobile

(Continued from previous page)
which have a higher level of authority than a report written by an ITU Working Party.

[78] *See, e.g.*, Nextel Petition at 5-8 (citing, *inter alia*, *ATC Report and Order*, 18 FCC Rcd 1962); Sprint Petition at 5; WCA Petition at 9-11 (citing 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*, FCC 01-256, 16 FCC Rcd 17222 (2001) (*AWS Report and Order*)).

[79] *See, e.g.*, Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Band and 14.0-14.5 GHz/11.7-12.2 GHz Bands, IB Docket No. 02-10, FCC 04-286, *Report and Order*, 20 FCC Rcd 674 (2005) (adopting rules that allow satellite providers to operate in the same spectrum as incumbent terrestrial operators).

[80] *AWS Report and Order*, 16 FCC Rcd at 17241 ¶¶ 35, 36.

[81] *See generally ATC Report and Order*, 18 FCC Rcd 1962.

[82] *See* 47 C.F.R. § 27.55(4).

services in the 2495-2500 MHz band.[83]

3. Grandfathered BAS Operations

35. *Background.* As of July 25, 1985, the Commission ceased accepting applications for new or modified BAS and Part 101 microwave stations in the 2483.5-2500 MHz band.[84] Existing stations are grandfathered and operate on a co-primary basis with the MSS and BRS. These operations include fixed point-to-point TV Relay stations[85] (Intercity Relays (ICR) and TV Translator Relays (TTR)), mobile TV pickup (TVPU) stations licensed under Part 74 of our rules, and Local Television Transmission Service (LTTS) stations, licensed under Part 101 of our rules. As indicated by our licensing records, this band is lightly used by these services – only 11 TV Relay stations (10 ICR and one TTR), 77 TVPU stations,[86] and one LTTS station[87] currently operate in the band.

36. *Petitions.* The BRS Petitioners contend that the BRS operators cannot share spectrum with the grandfathered licensees and that the Commission must relocate BAS and LTTS licensees in the 2496-2500 MHz band.[88] To bolster this claim, WCA provides a report completed by Kessler and Gehman Associates, Inc. (KGA) that concludes that a BRS receiver operating in the new Channel 1 spectrum will experience interference even if it is located several miles away from a BAS mobile unit.[89]

---

[83] *See* 47 C.F.R. § 2.106 US391.

[84] For the purpose of this discussion, BAS operations will be defined to include Part 101 LTTS.

[85] TV Relay stations use fixed point-to-point facilities primarily to transmit or relay TV program material and related communications for use by TV broadcast stations.

[86] TVPU stations are used to perform electronic newsgathering (ENG) at the scene of a breaking event and to cover scheduled events, such as sport matches. TVPU stations may transmit from an ENG truck directly to a fixed receiver at the station or through a relay link at a remote fixed receiver location. They may also originate or relay transmission through aeronautical TVPU platforms, such as blimps, to a fixed receive point or to a mobile satellite uplink truck, or other facilities, to reach the ultimate receive point, typically a studio. TVPUs also transmit from "window ledge" or mobile camera locations to on-site production facilities or to a TVPU truck for relay to a fixed point. The majority of the 77 grandfathered TVPU stations are licensed with a circular geographic area designated by a radius (in kilometers) around a set of coordinates (latitude/longitude). The rest (27) are licensed for city-wide coverage and one for county-wide coverage.

[87] LTTS typically is used to provide temporary service to broadcasters and the community antenna relay service (CARS), and is coordinated on a case-by-case basis, such that the LTTS licensee is responsible for determining the presence of other systems in order to protect its own receivers from interference. The one grandfathered LTTS station is licensed on a nationwide basis over several bands from 1.9 to 31.3 GHz.

[88] Sprint Petition at 7-8; WCA Petition at 16-23. *See also* Nextel Petition at 11-12, n.32 (citing filings by WCA in support of its contention that the "Commission departs from the record evidence concerning interference between BRS and grandfathered licenses . . .").

[89] WCA Petition at 16-17. According to WCA, interference can occur at distances ranging from 11-39 miles based on moderate antenna height assumptions and even greater distances if antennas reach farther above ground. *Id.* at 17. WCA also claims that the inability of BAS and BRS to share spectrum has been set forth in previous Commission proceedings. *Id.* at 17. For example, WCA states that, in response to a proposal to relocate BRS channels 1 and 2 to the 2490-2500 MHz band, WCA, in its reply comments, discussed the adjacent channel interference that could result from analog BAS operations at 2467-2483.5 MHz. *Id.* at 17.

Similarly, SBE argues that the Commission mistakenly concluded that by utilizing proper frequency coordination techniques, MSS ATC base stations operating in the 2487.5-2493 MHz band could co-exist with operations on grandfathered TV BAS Channel A10 operating in the 2483.5-2500 MHz band. SBE further argues that BRS operations at 2496-2502 MHz, which would involve "intensive, cellular-like use with base stations and thousands of customer premises equipment (CPE) devices, would create a similar problem for TV BAS operations."[90]

37. SBE proposes to resolve its interference concerns by converting the 2.5 GHz TV BAS band into three 12-megahertz-wide digital channels and moving these operations to the 2450-2486 MHz band.[91] SBE states that this proposal could be implemented concurrently with Nextel's transition of BAS operations at 1990-2025 MHz to the 2 GHz TV BAS band.[92] SBE further notes that there would be an additional cost to convert fixed link 2.5 GHz TV BAS from analog to digital, but that MSS ATC and BRS-1 operators – and not Nextel – should be required to pay this cost.[93] SBE claims its proposal will terminate the existing co-channel relationships of MSS and BRS with TV BAS, reduce out-of-band emissions from TV BAS operations as digital operations need to meet a more stringent emission mask, and make digitally modulated TV BAS operations less susceptible to interference from co-channel ISM devices and co-channel Part 15 spread spectrum devices at 2400-2483.5 MHz.[94] WCA supports SBE's proposal to revise the BAS channel plan, but concludes that the beneficiaries of BAS relocation – Globalstar and the 1.7/2.1 GHz AWS auction winners – should bear the costs of relocating BAS.[95]

38. *Discussion.* We conclude that spectrum sharing between BAS and BRS in this band will be possible, and thus we deny the parties' request to relocate incumbent BAS operations. First, as noted above, there are relatively few BAS facilities operating in the band and this number will not increase.[96] In many geographic areas where BRS will be operating there may not be any BAS operations. Moreover, in areas where BRS and BAS operations may coexist, licensees can implement measures to reduce the potential for interference. For example, because the majority of BAS stations are authorized to use channels outside the 2496-2500 MHz band, these licensees may be able to use other BAS channels in the 2 GHz band and thus facilitate the coordination of BRS and BAS operations in the 2496-2500 MHz band.

---

[90] SBE Petition at 1-4. SBE claims that frequency coordination cannot make operations of ATC and BAS on a co-channel basis possible. SBE Petition at 2.

[91] SBE Petition at 4, 5. These channels would be designated as Channel A8d at 2450-2462 MHz; Channel A9d at 2462-2472 MHz, and Channel A10d at 2472-2486 MHz. SBE states that, as a result of its proposal, a 1.5-megahertz guard band would separate TV BAS Channel A10d and the MSS ATC band. *Id.* at 4. *See also* WCA Opposition at 12 (endorsing SBE's proposal).

[92] *See* SBE Petition at 5-6. SBE claims that such action could reduce Nextel's costs because equipment costs could decrease if analog operations are no longer needed to support 2.5 GHz TV BAS operations. *Id.*

[93] *Id.* at 6-7.

[94] *Id.* at 4-7.

[95] WCA Petition at 19. *See also* Nextel Petition at 12-13; Sprint Petition at 8 (stating that the beneficiaries of the BAS relocation should pay the costs, which would include the AWS auction winners). WCA recognizes the efforts of Nextel to assist in the cost savings of the relocation, but still sticks to its argument that the beneficiaries, Globalstar and the AWS auction winners, should bear those costs. *See* WCA Reply at 3.

[96] *See supra* ¶ 35.

For fixed stations, coordination procedures between stations are well established and although formal coordination may not be required, those procedures can be used by licensees to avoid situations that may cause harmful interference.[97] For mobile operations, we note that BAS licensees generally have access to multiple receive sites. In some cases, BAS licensees, knowing the location of BRS operations, can select a receive site that avoids causing interference to those operations. BAS licensees are accustomed to operating in this manner in order to permit multiple licensees to provide service in a limited amount of spectrum.[98] Similarly, BRS licensees can design their operations (or coordinate) using information on BAS operations from our ULS database. For some limited information, such as BAS receive only sites used for mobile BAS operations, which currently are not listed in the database, we encourage BAS licensees to provide this information to BRS licensees (both are co-primary in the band) and coordinate their operations.[99]

39. Regarding the study submitted by WCA claiming that there will be interference between BRS and BAS systems, we note that the study only assumes worst-case situations which are unlikely to exist in an actual deployment. The study assumes, for example, a direct line-of-site transmission path between BAS and BRS transmitting and receiving antennas, perfect antenna coupling, and no losses due to antenna angular and polarization discrimination. Because all of these factors are unlikely to exist at any given time, the separation distances claimed by the study may, in fact, be substantially shorter than those claimed.

40. We recognize however, that in a few cases successful sharing between BRS and BAS in this band may be difficult to achieve. Nonetheless, we do not agree with SBE's suggestion that all BAS operations in the 2.5 GHz band need to be relocated to resolve a few difficult sharing cases that may occur. Individual parties, however, may agree to relocate some BAS operations out of this band in order to relocate BRS operations into this band. We note, for example, that the Commission has proposed procedures for AWS licensees in the 2.1 GHz band to relocate BRS licensees into this band and provide BRS licensees with comparable facilities.[100] The parties could agree that the AWS licensee relocate, as necessary, only those BAS operations in the 2496-2500 MHz band that impede their ability to provide

[97] *See* 47 C.F.R. §§ 74.638, 101.103, 101.105.

[98] Such a situation occurs at the site of a major news event.

[99] The availability of such data would facilitate sharing between BAS and BRS operations. We note, for example, that SBE suggests that the availability of receiver data in the ULS would facilitate BRS/BAS sharing in the lower adjacent band. *See* SBE July 11, 2005, Response to Reply of Globalstar to the Informal Objection of the Society of Broadcast Engineers, Inc., filed regarding Globalstar applications for Mobile Satellite Service (MSS) Ancillary Terrestrial Component base stations, File Nos. SAT-MOD-20050301-00054 and SAT-MOD-20050301-00261. We also note that, after the Commission modified the coordination rules for the BAS bands above 2 GHz, it provided a mechanism for BAS licensees to add their receive-only sites for fixed BAS operations to the database to facilitate the coordination process and avoid interference. *See* Revisions to Broadcast Auxiliary Service Rules in Part 74 and Conforming Technical Rules for Broadcast Auxiliary Service, Cable Television Relay Service and Fixed Services in Parts 74, 78 and 101 of the Commission's Rules, ET Docket No. 01-75, *Report and Order*, 17 FCC Rcd 22979, 23001-23005 ¶¶ 53-65 (2002).

[100] Comparable facilities would maintain the BRS operations' throughput, reliability, and operating costs. *See generally AWS 8th R&O and 5th NPRM*, 20 FCC Rcd 15866.

comparable facilities to the BRS licensee in this band.[101]

41. Also, we note that in the *ATC Report and Order*, the Commission recognized the potential for mutual interference between ATC operations and the grandfathered incumbent operations in the band, but we ultimately determined that these services would be able to share spectrum and that any potential interference concerns could be mitigated through coordination.[102] Similarly, in the *ATC MO&O*, we upheld our decision concerning ATC licensees' coordinated use of the 2483.5-2500 MHz band with BAS licensees, but did not require that ATC licensees relocate BAS operations.[103] In addition, in the *Big LEO Spectrum Sharing Order*, we concluded that coordinated sharing of the 2483.5-2500 MHz band by ATC and BAS operators was still possible, and declined to relocate BAS operations when ATC operations in this band were moved down 5 MHz to 2487.5-2493 MHz.[104] In this case, coordinated sharing of the 2496-2500 MHz band by BAS and BRS operators is no different.

42. Finally, we note that SBE claims the relocation of BAS operations would improve spectrum sharing between BAS and MSS as well as with Part 15 unlicensed devices and Part 18 ISM equipment. However, the issue of sharing between those services is not a matter addressed in this docket. To the extent that SBE's plan to re-channel the entire 2450-2500 MHz band (BAS channels 8, 9, and 10) would address these sharing issues, it is beyond the scope of the proceeding. Those matters have already been settled in prior Commission decisions and therefore will not be addressed herein.[105]

4. Grandfathered Part 90 and Part 101 Operations

43. *Petitions.* The BRS Petitioners contend that the Commission must relocate grandfathered Part 90 and Part 101 licensees in the 2496-2500 MHz band because BRS operators cannot share spectrum with these licensees.[106] WCA points to Commission findings that ATC could suffer from and cause interference to these licensees and draws parallels between ATC and planned BRS operations

---

[101] Converting BAS channel 10 to digital transmission should eliminate the four megahertz sharing between BAS and BRS.

[102] *See ATC Report and Order,* 18 FCC Rcd at 2060-2063 ¶¶ 201-206. ATC operators, prior to construction and operation of ATC base stations, must consult local coordination committees for information on the frequencies used and the geographic locations of the BAS systems that may receive interference, and must take the steps necessary to avoid causing harmful interference to these previously licensed facilities. *See id.* at 2061-2062 ¶ 203.

[103] *See ATC MO&O*, 20 FCC Rcd at 4650-4651 ¶¶ 93-94.

[104] *See Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13389-13390 ¶ 75. Subsequently, the International Bureau granted Globalstar the authority to operate ATC in the 2487.5-2493 MHz band under this ATC-BAS coordinated sharing approach, despite WCA's and SBE's specific objections. *See* Globalstar LLC, *Order and Authorization*, 21 FCC Rcd 398, 408-409 ¶¶ 27-31 (Int'l Bur. 2006). Neither Globalstar, WCA nor SBE has requested review or reconsideration of that decision.

[105] *See ATC MO&O,* 20 FCC Rcd at 4650-51, ¶¶ 93-94 (declining SBE's request to mandate a relocation scheme for BAS Channels A8, A9, and A10). *See also ATC Report and Order,* 18 FCC Rcd at 2060-63 ¶¶ 201-206.

[106] Sprint Petition at 7-8; WCA Petition at 16-23. *See also* Nextel Petition at 11-12, n.32 (citing filings by WCA in support of its contention that the "Commission departs from the record evidence concerning interference between BRS and grandfathered licenses . . .").

in the band.[107] In particular, WCA argues that because ATC facilities and some BRS operations have similar technical and operating characteristics, BRS operations will also suffer from and cause interference to the grandfathered Part 90 and Part 101 operations, but that, unlike ATC operators, BRS licensees are not required to protect the Part 90 and Part 101 licensees or accept interference caused by these licensees.[108] WCA concludes that the beneficiaries of relocating the Part 90 and Part 101 licensees, the AWS auction winners and, possibly, Big LEO ATC operators, should bear the relocation costs.[109] SBE also recommends that the Commission transition Part 90 public safety operations in the 2450-2500 MHz band to the 2450-2486 MHz band, using 12-megahertz wide digital channels.[110] SBE argues that public safety providers utilizing analog modulation in the 2487.5-2500 MHz band may experience increasing interference in the future unless the Commission adopts SBE's recommendation.[111]

44. *Discussion.* The 2496-2500 MHz band, which is part of the larger 2483.5-2500 MHz band, was originally licensed for conventional public safety operations as well as to fixed terrestrial stations, including temporary fixed (transportable) stations, operating as links in microwave relay systems serving petroleum companies. Since 1985, however, the Commission has prohibited any further terrestrial licensing in this band but has permitted existing stations whose initial applications were filed on or before July 25, 1985 to be "grandfathered" in the 2483.5-2500 MHz band subject only to license renewal.[112] A database search shows that the 2496-2500 MHz band currently includes 11 point-to-point microwave, private-industrial business licenses ("Part 101 grandfathered licenses") and 4 point-to-point public safety licenses ("Part 90 grandfathered licenses") that are grandfathered on a primary basis.

45. In the *BRS/EBS Order*, the Commission noted that new BRS licensees in the 2495-2500 MHz band could successfully share this spectrum through coordination efforts, given the limited number of grandfathered licensees involved, but deferred consideration of the possible relocation of these operations to a future proceeding.[113] In the *Big LEO Spectrum Sharing Order*, the Commission also did not establish a specific relocation plan for these remaining grandfathered incumbents at 2495-2500 MHz but noted that it would provide a relocation plan, if needed, in addressing AWS relocation issues in ET Docket No. 00-258.[114] For the reasons discussed below, we do not believe that it is necessary to require the relocation of the grandfathered Part 90 and Part 101 licensees in the 2496-2500 MHz band.

46. First, we disagree with the BRS Petitioners' assertions that BRS operations cannot co-exist with the grandfathered Part 90 and Part 101 operations in the 2496-2500 MHz band. The BRS

---

[107] WCA Petition at 20. *See also* Sprint Petition at 8.

[108] WCA Petition at 20-21. *See also* Sprint Petition at 8.

[109] WCA Petition at 21. *See also* Nextel Petition at 12-13; Sprint Petition at 8 (stating that the beneficiaries of the Part 90 and Part 101 relocation should pay the costs, which would include the AWS auction winners).

[110] SBE Petition at 8. *See supra* ¶ 37 (SBE making similar proposal for the 2.5 GHz TV BAS band).

[111] SBE Petition at 8.

[112] The grandfathered status of the incumbents in this band is set forth in Parts 2, 90, and 101 of the Commission's Rules. *See* 47 C.F.R. §§ 2.106 NG147, 90.20(d)(73), 90.35(c)(74), 101.147(f)(2).

[113] *See BRS/EBS R&O*, 19 FCC Rcd at 14179-80 ¶ 28.

[114] *See Big LEO Spectrum Sharing Order*, 19 FCC Rcd at 13386 ¶ 67.