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

In the Matter of	)	
	)	
XM Radio Inc.	)	
	)	
Application for Minor Modification to Relocate Satellite Digital Audio Radio Service (SDARS) Satellite from 85° W to 115° W	)	File Nos.: SAT-MOD-20040212-00017; 72-SAT-AMEND-97; 10/11-DSS-P-9312/15/92; 26/27-DSS-LA-931/15/93; 83/84-SAT-AMEND-953/10/95; (Call Signs: S2118 (XM-Roll) and S2119 (XM-Rock))
	)	
Application for Authority to Launch and Operate Replacement SDARS Satellite at 85° W	)	File No. SAT-RPL-20040212-00018 (Call Sign: S2616 (XM-3))
	)	
Application for Authority to Launch and Operate Replacement SDARS Satellite at 115° W	)	File No. SAT-RPL-20040212-00019 (Call Sign: S2617 (XM-4))
	)	

ORDER AND AUTHORIZATION

Adopted: January 26, 2005 **Released: January 26, 2005**

By the Chief, Satellite Division, International Bureau:

I. INTRODUCTION

1. By this Order, we authorize XM Radio Inc. (XM Radio) to launch and operate two replacement satellites, XM-3, Call Sign S2616, at the 85° W.L. orbital location and XM-4, Call Sign S2617, at the 115° W.L. orbital location. These satellites will replace existing in-orbit satellites at these locations that are experiencing technical difficulties that will reduce their expected useful life. In addition, we grant XM Radio's request to relocate its existing in-orbit satellite at 85° W.L., "XM-Roll," Call Sign S2118, to 115° W.L. and to operate it at the 115° W.L. orbital location with another existing satellite, "XM-Rock," Call Sign S2119. Upon the successful launch and operation of XM-4, we grant authority to XM Radio to operate XM-Rock and XM-Roll as in-orbit spares at 115° W.L. for the remainder of the satellites' existing license terms. These authorizations will allow XM Radio to continue to provide Satellite Digital Audio Radio Service (SDARS) to U.S. consumers despite unanticipated technical difficulties experienced by XM Radio's existing in-orbit satellites.

II. BACKGROUND

2. In 1997, the International Bureau authorized XM Radio to launch and operate a satellite system in the geostationary-satellite orbit (GSO) in order to provide SDARS in the 2332.5-2345 MHz

frequency band from the 85° W.L. and 115° W.L. orbital locations.[1] This authorization afforded XM Radio the opportunity to provide U.S. consumers with continuous, nationwide radio programming with compact disc quality sound. The Bureau found that this new service had the potential to increase the variety of programming available to the listening public, and to offer niche programming to listeners with special interests.[2] In addition, the Bureau found that SDARS had the technological potential to provide a wide range of audio programming options to rural and mountainous sections of the country that have historically been underserved by terrestrial radio.[3] In March 2001, the Satellite Division modified XM Radio's authorization to increase the power of XM Radio's satellites, to revise the downlink frequency plan, and to increase the transmission rate of each of its satellite carriers.[4]

3. In March 2001, XM Radio successfully launched its first satellite, called "XM Rock," to the 115° W.L. orbital location.[5] Two months later, it successfully launched its second satellite, called "XM Roll," to the 85° W.L. orbital location.[6] XM Radio initiated commercial service to the public in September 2001.[7] Currently, there are more than 3.1 million subscribers to XM Radio.[8]

4. In February 2004, XM Radio filed three applications to modify its existing space station authorization and to launch and operate replacement satellites.[9] In its applications, XM Radio reports that the solar arrays of the XM Rock and XM Roll satellites have progressively degraded, which is expected to lead to an earlier-than-anticipated decline in the performance of the satellites and to a reduction in the expected useful life of the satellites.[10] In order to ensure uninterrupted service to subscribers, XM Radio requests authority to launch and operate a replacement satellite, XM-3, that will replace the XM-Roll

[1] American Mobile Radio Corp., *Order and Authorization*, 13 FCC Rcd 8829 (Int'l Bur. 1997) (*1997 Authorization Order*). American Mobile Radio Corp. changed its name in 1998 to XM Satellite Radio Inc.

[2] *Id.* at 8829 (para. 2).

[3] *Id.*

[4] XM Radio Inc., *Order and Authorization*, 16 FCC Rcd 5603 (Int'l Bur., Sat. & Rad. Div. 2001) (*2001 Modification Order*). Specifically, the *2001 Modification Order* authorized XM Radio (1) to increase the maximum Equivalent Isotropically Radiated Power (EIRP) of each of its DARS satellites from 62 dBW to 68.5 dBW; (2) to revise its downlink channelization plan by increasing the number of channels from five to six, including four carrier frequencies (two per satellite) of 1.84 MHz each and two frequencies for terrestrial repeaters of 2.53 MHz each; and (3) to increase the transmission rate of each of its satellite carriers to 3.28 Mbits/s.

[5] *See* XM Radio Press Release, "'XM Rock' Satellite Hits Critical In-Orbit Milestones; 'XM Roll' Launch Slated for May 7", dated April 9, 2001, available on-line at: http://www.xmradio.com/newsroom/screen/press_release_2001_04_09a.html.

[6] *See* XM Radio Press Release, "XM Radio Successfully Launches Second Satellite", dated May 8, 2001, available on-line at: http://www.xmradio.com/newsroom/screen/press_release_2001_05_08.html.

[7] XM Radio also received Special Temporary Authority (STA) to operate in-band terrestrial repeaters for commercial service in certain markets to fill gaps in satellite coverage. *See* XM Radio, Inc., *Order and Authorization*, 16 FCC Rcd 16781 (Int'l Bur. 2001), *as modified by* 16 FCC Rcd 18484, *pet. for recon. pending*.

[8] *See* XM Radio Press Release, "XM Radio Tops 3.1 Million Subscribers Ahead of Year-End Goal", dated December 27, 2004, available on-line at: http://www.xmradio.com/newsroom/screen/pr_2004_12_27.html.

[9] XM Radio Inc., Application for Minor Modification to Relocate Satellite Digital Audio Radio Service (SDARS) Satellite (Call Sign S2118) from 85°W to 115°W, File No. SAT-MOD-20040212-00017; XM Radio Inc., Application for Authority to Launch and Operate Replacement SDARS Satellite at 85°W, File No. SAT-RPL-20040212-00018; XM Radio Inc., Application for Authority to Launch and Operate Replacement SDARS Satellite at 115°W, File No. SAT-RPL-20040212-00019 (collectively, "XM Radio Modification Application").

[10] XM Radio Modification Application at 3-4.

satellite at 85° W.L.[11] XM Radio also seeks authority to relocate the XM-Roll satellite to the 115° W.L. orbital location, where it will be temporarily co-located with XM-Rock, with each satellite transmitting at half of its original capacity.[12] Finally, XM Radio requests authority to launch and operate a replacement satellite, XM-4, to the 115° W.L. orbital location by 2007 and to operate XM-Rock and XM-Roll at the 115° W.L. orbital location as non-transmitting (except for telemetry transmissions) in-orbit spares upon successful operation of XM-4 at 115° W.L.[13]

5. According to XM Radio, the replacement satellites will use S-band frequencies (2332.5-2345 MHz) for space-to-Earth service links and X-band frequencies (7025-7075 MHz) for Earth-to-space feeder links and tracking and control functions.[14] On-station and transfer orbit telemetry will be transmitted within the 2332.5-2345.0 MHz frequency band.[15] XM Radio's licensed earth station feeder uplink is located in Washington, DC.[16] Telemetry, tracking, and control will be conducted from stations located in Canada and the United States, with U.S. earth stations having the ability to override the Canada TT&C earth stations, at least on a short term basis.[17] XM Radio will operate its replacement satellites on a non-broadcast, non-common-carrier basis.[18]

6. The XM Radio Modification Application was placed on public notice.[19] No comments were filed in response to the notice. XM Radio subsequently updated certain information regarding the technical characteristics of its replacement satellites and the desired orbital locations of its existing and replacement satellites.[20]

III. DISCUSSION

7. Although the Commission adopted new licensing procedures for space stations as part of the *First Space Station Licensing Reform Order*,[21] the Commission explicitly stated that none of the rules adopted in that Order are applicable to SDARS applications.[22] In the *First Space Station Licensing Reform Order*, the Commission also reiterated its policy governing the replacement of GSO satellites. Given the huge costs of building and operating GSO space stations, it found that there should be some

[11] XM Radio Modification Application at 4.

[12] XM Radio Modification Application at 4.

[13] XM Radio Modification Application at 4-5.

[14] XM Radio Modification Application, Appendix A at 1.

[15] XM Radio Modification Application, Appendix A at 7.

[16] XM Radio Modification Application, Appendix A at 18.

[17] XM Radio Modification Application, Appendix A at 21-22.

[18] XM Radio Modification Application, Appendix A at 25.

[19] Public Notice, *Policy Branch Information: Satellite Space Station Applications Accepted for Filing*, Report No. SAT-00202 (Mar. 19, 2004).

[20] Letter from Lon C. Levin, Senior Vice President, XM Radio Inc., to Marlene H. Dortch, Secretary, FCC, dated Aug. 20, 2004 (*August 20 Letter*).

[21] Amendment of The Commission's Space Station Licensing Rules And Policies, *First Report and Order and Further Notice of Proposed Rulemaking*, IB Docket No. 02-34, 18 FCC Rcd 10760 (2003) (*First Space Station Licensing Reform Order*).

[22] *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10764 n.4.

assurance that operators will be able to continue to serve their customers.[23] Accordingly, the Commission has stated that, when an orbit location remains available for a U.S. satellite with the technical characteristics of the proposed replacement satellite, it will generally authorize the replacement satellite at the same location.[24] The Commission has also acted on applications for replacement satellites as they are filed, without consolidating them into a processing group.[25] Nothing in the *First Space Station Licensing Reform Order* was intended to affect this policy with respect to SDARS replacement satellite applications.

8. Although the Commission adopted a "grant stamp" procedure for unopposed replacement satellite applications with technical characteristics consistent with those of the satellite to be retired as part of the *First Space Station Licensing Reform Order*,[26] this procedure does not apply to SDARS applications for the reason stated in the proceeding paragraph. Moreover, because XM Radio requests a waiver of certain of the Commission rules, a written decision is appropriate in this case. Accordingly, this Order examines the applications of XM Radio for both replacement satellites, XM-3 and XM-4, in light of the legal and technical qualification requirements for SDARS licensees set forth by the *1997 SDARS Order*[27] and Section 25.144 of the Commission's rules.[28]

A. Legal Qualifications

9. Section 25.144(a)(1) establishes four entities that are legally eligible to hold SDARS licenses.[29] XM Radio (formerly American Mobile Radio Corp.) is one of the four eligible entities and is one of the two eligible entities that were awarded SDARS licenses by auction in 1997.[30] No party has

[23] *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10854-55 (para. 250), citing Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service, *Memorandum Opinion and Order*, 3 FCC Rcd 6972, 6976 n.31 (1988) (*1988 Order Assignment Order*); Hughes Communications Galaxy, Inc., *Order and Authorization*, 6 FCC Rcd 72, 74 n.7 (1991) (*Hughes Replacement Order*); GE American Communications, Inc., *Order and Authorization*, 10 FCC Rcd 13775, 13775-76 (para. 6) (Int'l Bur. 1995) (*GE Americom Replacement Order*).

[24] *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10855 (para. 250), citing *1988 Order Assignment Order*, 3 FCC Rcd at 6976 n.31; *GE Americom Replacement Order*, 10 FCC Rcd at 13775-76 (para. 6).

[25] *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10855 (para. 250), citing *GE Americom Replacement Order*, 10 FCC Rcd at 13775-76 (para. 6); Loral Spacecom Corp., *Order and Authorization*, 13 FCC Rcd 16348-16440 (para. 5) (Int'l Bur., Sat. & Rad. Div. 1995).

[26] *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10854-56 (paras. 250 & 253). Under the grant stamp procedure, unopposed replacement satellite applications can be stamped "granted," and a copy returned to the applicant, without the need for a written order. A public notice of the grant would be issued to inform the public of the Commission's action. *See id.*

[27] Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Report and Order, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, IB Docket No. 95-91, 12 FCC Rcd 5754 (1997) (*1997 SDARS Order*).

[28] 47 C.F.R. § 25.144.

[29] 47 C.F.R. § 25.144(a)(1). The four entities eligible for licensing in SDARS are: Satellite CD Radio; Primosphere Limited Partnership; Digital Satellite Broadcasting Corporation; and American Mobile Radio Corporation. Because the Commission determined that not more than two systems could operate in the 25 megahertz of spectrum allocated domestically for SDARS, only two of the four eligible entities could be issued licenses. *See 1997 SDARS Order*, 12 FCC Rcd at 5812 (para. 143). The two licenses were awarded by competitive bidding, pursuant to the Commission's rules, *see* 47 C.F.R. § 25.401.

raised any other question as to XM Radio's legal qualifications to be a Commission licensee. Accordingly, we affirm that XM Radio has satisfied the legal requirements of Section 25.114(a)(1).

B. Technical Requirements

10. Section 25.144(a)(3) sets forth three technical qualifications that are specifically applicable to SDARS applications.[31] First, SDARS applications must demonstrate that the proposed system will, at a minimum, serve the 48 contiguous United States (CONUS).[32] XM Radio states that its replacement satellites, XM-3 and XM-4, will provide SDARS and ancillary services to CONUS.[33] In view of this representation and the record before us, we conclude that XM Radio's replacement satellites comply with the coverage/service area requirement of Section 25.144(a)(3).

11. Second, an SDARS applicant must certify that its system includes a receiver that will permit end users to access all licensed SDARS systems that are operational or under construction.[34] This requirement will allow consumers to access services from all licensed SDARS systems using a single receiver.[35] In its applications, XM Radio does not certify that its system currently includes such a receiver, but refers to a letter from XM Radio to the Commission dated October 6, 2000, which XM Radio asserts provides notice of its "continuing program to develop an interoperable satellite radio receiver."[36] In the *October 6 Letter*, the two SDARS licensees announced an agreement to develop a unified standard for satellite radios, and stated their anticipation that interoperable chips capable of receiving both services would be produced in volume in mid 2004.[37] The two companies also agreed to introduce interim interoperable radios, prior to the introduction of fully-interoperable chipsets, that would include a common wiring harness, head unit, antenna, and an interchangeable trunk-mounted box containing processing elements for both company's signals.[38]

(...continued from previous page)

[30] The other eligible entity that was awarded an SDARS license at auction is Sirius Satellite Radio Inc. (formerly Satellite CD Radio). *See also* Public Notice, *"FCC Announces Auction Winners for Digital Audio Radio Service,"* DA 97-656 (Apr. 2, 1997). The two SDARS licensees paid a combined total of $173.2 million for the two licenses.

[31] 47 C.F.R. § 144(a)(3).

[32] 47 C.F.R. § 144(a)(3)(i); *see also 1997 SDARS Order*, 12 FCC Rcd at 5793-94 (paras. 97-99).

[33] XM Radio Modification Application at 26.

[34] 47 C.F.R. § 144(a)(3)(ii).

[35] *See 1997 Authorization Order,* 13 FCC Rcd at 8846 (para. 38), citing *1997 SDARS Order*, 12 FCC Rcd at 5797 (para. 106).

[36] XM Radio Modification Application, Appendix A at 26, citing Letter from John R. Wormington, XM Radio Inc., and Robert D. Briskman, Sirius Satellite Radio Inc., to Magalie Roman Salas, FCC, dated Oct. 6, 2000 (*October 6 Letter*).

[37] *October 6 Letter* at 4.

[38] *October 6 Letter* at 4. We take note of the fact that since the *October 6 Letter* both XM Radio and Sirius have introduced tuners that will allow satellite radio-ready headsets offered by third-party consumer electronic manufacturers to receive the signals of both SDARS licensees. *See* Sirius Press Release, "Sirius and Pioneer Offer Tuner for Satellite Radio: New Tuner Compatible with SAT-Ready Head Units from Pioneer", dated January 5, 2005, available on-line at: http://www.sirius.com/servlet/ContentServer?pagename=Sirius/CachedPage&c=PresReleAsset&cid=1104779643733; *see also* XM Radio Press Release, "XM Satellite Radio Introduces XM Direct: Universal Tuner for Car Stereos Now Available for Third-Party Developers, Distributors," dated November 17, 2003, available on-line at: http://www.xmradio.com/newsroom/screen/pr_2003_11_17.html.

12. We observe that some time has elapsed since the *October 6 Letter* was initially filed with the Commission. Accordingly, to refresh the record, we will send letters to XM Radio and Sirius requesting that they provide the current status of their efforts to develop an interoperable receiver, and that they provide a clear timeframe for making such an interoperable receiver available to the public.

13. The third technical qualification of Section 25.144(a)(3) requires SDARS licensees to identify the compression rate(s) they plan to use to transmit audio programming, as well as for the transmission of any services that are ancillary to SDARS.[39] XM Radio states that audio coding permits a compression factor of 20 for audio and ancillary services transmitted by its replacement satellites.[40] We find that this information satisfies the compression disclosure requirements of Section 25.144(a)(3).

14. In addition to the SDARS-specific technical requirements of Section 25.144(a)(3), the SDARS rules also require an SDARS applicant to describe in detail its proposed system and to set forth all pertinent technical and operational aspects of the system.[41] In particular, an SDARS applicant must file information demonstrating compliance with Section 25.114 of the Commission's rules.[42] XM Radio has provided the technical and operational aspects of both the XM-3 and XM-4 replacement satellites. As discussed in the following paragraphs, we find that XM Radio has demonstrated compliance with the technical requirements of Section 25.114 as required by our SDARS rules.

15. *Service Link Margin.* The Commission declined to adopt a requirement that SDARS licensees be capable of providing a specific value of service link for a given geographic area; instead, SDARS applicants need only provide the information on their service link budgets that is required by Section 25.114 of the Commission's rules.[43] XM Radio has provided this information for each of its replacement satellites,[44] and our review finds it sufficient to fulfill the Commission's requirement.

16. *PFD Limits.* The SDARS service rules do not set a specific power flux density (PFD) limit for SDARS systems, but rather rely on the expectation that appropriate PFD limits will be established through international coordination with adjacent countries.[45] SDARS applicants are required, however, to identify the PFD limits at the Earth's surface from their spacecraft.[46] As part of its applications, XM Radio states that the maximum (peak) PFD limit of its replacement satellites will not exceed -118.0 dBW/m^2/4 kHz within the borders of the United States.[47] In addition, XM Radio observes that the United States has entered into international coordination agreements with Canada and Mexico that limit the PFD level from U.S.-licensed SDARS satellites into Canada and Mexico.[48] XM Radio states that its replacement satellites will operate in full compliance with these PFD limits, and we explicitly condition XM Radio's authority to operate its replacement satellites on compliance with international coordination

[39] 47 C.F.R. § 25.144(a)(3)(iii); *1997 SDARS Order*, 12 FCC Rcd at 5798-99 (paras. 108-09).

[40] XM Radio Modification Application, Appendix A at 15, 26.

[41] 47 C.F.R. § 25.144(a)(2).

[42] *Id.*

[43] *1997 SDARS Order*, 12 FCC Rcd at 5795 (para. 101).

[44] XM Radio Modification Application, Appendix A at 15-17.

[45] *1997 SDARS Order*, 12 FCC Rcd at 5801 (para. 113).

[46] *1997 SDARS Order*, 12 FCC Rcd at 5801 (para. 114).

[47] XM Radio Modification Application, Appendix A at 4, 20 (identifying a maximum (peak) pfd of -118.0 dBW/m^2/4 kHz).

[48] XM Radio Modification Application, Appendix A at 20-21.

agreements between the U.S. and foreign administrations.

17. *Out-of-band Emissions*. The SDARS service rules require SDARS licensees to satisfy the out-of-band and spurious emission limits contained in Section 25.202(f) of the Commission's rules, which requires that the mean power of emissions will be attenuated below the mean output power of the transmitter in accordance with the schedule set forth in our rules.[49] XM Radio provides information about its system parameters that we find demonstrates compliance with the schedule set forth in Section 25.202(f).[50]

18. *Telemetry Beacons.* The SDARS service rules require licensees to accommodate telemetry beacons for their systems within their exclusively licensed bandwidth, but allow each licensee the flexibility to determine the appropriate amount of spectrum necessary for its telemetry beacons.[51] We find that XM Radio complies with this requirement by locating its on-station and transfer orbit telemetry beacons within its exclusively licensed S-band spectrum at 2332.5-2345.0 MHz.[52]

19. *Cross Polarization.* The SDARS service rules permit each SDARS licensee to employ cross-polarization within its exclusively licensed frequency assignment and to employ cross polarized transmissions in frequency assignments of the other SDARS licensee under mutual agreement with the other licensee.[53] The XM Radio applications do not address the issue of frequency reuse through cross-polarization, nor do they identify whether XM Radio intends to use cross-polarization within its exclusive frequency assignment. XM Radio requests authorization to use left-hand circular polarization for its service downlink transmissions,[54] and we grant that request. XM Radio must apply to the Commission for approval of any deviations from its use of left-hand circular polarization for service downlink transmissions.

20. *Feeder Links.* The Commission has recognized that SDARS systems cannot operate without sufficient feeder-link spectrum.[55] The Commission identified the 7025-7075 MHz band as the spectrum for SDARS feeder-link operations.[56] The SDARS service rules state that the Commission will permit a SDARS feeder-link network to operate as a fixed-satellite service in the 7025-7075 MHz bands on a co-primary basis, but only after the applicant demonstrates that coordination with potentially-affected users in the band has been successfully completed.[57] Accordingly, we authorize XM Radio to launch satellites that are capable of operating in the 7025-7075 MHz band subject to successful licensing and coordination

[49] *1997 SDARS Order*, 12 FCC Rcd at 5801 (para. 115). An out-of-band emission is radio frequency energy on a frequency or frequencies immediately outside of the necessary bandwidth which results from the modulation process, but excluding spurious emissions. A spurious emission is radio frequency energy on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions exclude out-of-band emissions.

[50] XM Radio Modification Application, Appendix A at 4.

[51] *1997 SDARS Order*, 12 FCC Rcd at 5804 (para. 121).

[52] XM Radio Modification Application, Appendix A at 7.

[53] 47 C.F.R § 25.214(c)(4). *See also 1997 SDARS Order*, 12 FCC Rcd at 5804-05 (paras. 122-123).

[54] XM Radio Modification Application, Appendix A at 8, Table A-4.

[55] *1997 SDARS Order*, 12 FCC Rcd at 5807 (para. 129).

[56] *1997 SDARS Order*, 12 FCC Rcd at 5807 (para. 129).

[57] *1997 SDARS Order*, 12 FCC Rcd at 5809 (paras. 134-135).

of its feeder link earth stations.[58]

21. *Orbital Locations.* Section 25.114 requires applicants seeking authority for GSO satellites to identify the orbital location, or locations, requested for the satellite.[59] XM Radio's Modification Application, filed in February 2004, identifies the 85° W.L. orbital location for the XM-3 replacement satellite and the 115° W.L. orbital location for the XM-4 replacement satellite.[60] In addition, the Modification Application seeks authority to relocate XM-Roll from 85° W.L. to 115° W.L. upon the successful launch of the XM-3 replacement satellite.[61] By letter dated August 20, 2004, however, XM Radio clarified its desired orbital locations.[62] In its *August 20 Letter*, XM Radio states its intent to operate the XM-3 replacement satellite at the 85.10° W.L. orbital location and to relocate the XM-Roll satellite from 85° W.L. to 114.90° W.L.[63] The *August 20 Letter* states that the XM-4 replacement satellite would be operated at the 115° W.L. orbital location.[64] The *August 20 Letter* does not indicate any change to the position of XM-Rock, which is currently authorized to operate at 115° W.L.[65]

22. We grant XM Radio authority to launch and operate its replacement satellites, XM-3 and XM-4, and to relocate XM-Roll pursuant to the orbital locations specified in its original Modification Application filed in February 2004.[66] XM Radio's clarification in its *August 20 Letter* changes the orbital locations to be used by XM Radio's satellites and thus constitutes a major amendment that is subject to the Commission's public notice requirements.[67] Because the requested change in orbital locations was neither filed as an amendment nor placed on public notice, we do not consider it for purposes of this authorization and limit our authorization to the orbital locations specified in the original Modification Application. This action is without prejudice to XM Radio subsequently seeking to modify its orbital locations consistent with the *August 20 Letter* by means of a properly-filed modification application that satisfies the public notice requirements of the Commission's rules.

23. Our grant of authority to XM Radio to relocate XM-Roll from 85° to 115° W.L. is conditioned on XM Radio's coordination of all its tracking, telemetry, and command (TT&C) operations with existing geostationary satellites to ensure no unacceptable interference results from its TT&C operations during the relocation. During the relocation, XM Radio shall not operate the communications payload on the satellite. In addition, XM Radio must not cause harmful interference during the relocation to any other lawfully operating in-orbit satellite, and XM Radio must terminate operations on XM-Roll immediately upon notification of such interference and shall inform the Commission in writing immediately of such an event. During the relocation, XM Radio is required to accept interference from

[58] XM Radio has filed separate requests to modify its feeder-link earth stations. *See* File Nos. SES-MOD-20040610-00815; SES-MOD-20040819-01199. These earth station applications are outside the scope of this Order and will be addressed by separate Commission action.

[59] 47 C.F.R.§ 25.114(c)(5)(i).

[60] XM Radio Modification Application at 1-5.

[61] XM Radio Modification Application at 1-5.

[62] Letter from Lon C. Levin, Senior Vice President, XM Radio Inc., to Marlene Dortch, Secretary, dated August 20, 2004 (*August 20 Letter*).

[63] *August 20 Letter* at 2.

[64] *August 20 Letter* at 2.

[65] XM Radio Modification Application, at 1.

[66] We note that this authorization specifically does not extend to any in-orbit testing of XM-3 or XM-4 at orbital locations other than those authorized herein.

[67] 47 C.F.R. §§ 25.116(b)(1) and 25.151.

other lawfully operating in-orbit satellites. XM Radio must inform the Commission in writing that it has begun relocation of the satellite upon commencement of maneuvers to drift XM-Roll to 115° W.L.

C. Other Issues

24. *In-orbit Spares*. XM Radio's Modification Application states that upon successful operation of XM-4 at 115° W.L., it will cease transmissions from XM-Rock and XM-Roll (except for telemetry transmissions) and the two satellites will operate as in-orbit spares at the 115° W.L. orbital locations.[68] As discussed above,[69] XM Radio subsequently stated its intent to relocate the XM-Roll satellite from 85° W.L. to 114.90° W.L., rather than to 115° W.L.[70] For the reasons set forth above,[71] we will not consider XM Radio's subsequent change of orbital location for purposes of this authorization and limit our authorization to the orbital location specified in the original Modification Application. Accordingly, we authorize the use of XM-Rock and XM-Roll as non-transmitting (except for telemetry transmissions) in-orbit spares at 115° W.L. after the successful operation of XM-4. We also remind XM Radio of its obligation to seek Commission authority prior to any movement of XM-Rock and XM-Roll from 115° W.L., other than for post-mission disposal maneuvers pursuant to Section 25.283(a) of the Commission's rules.[72]

25. *License Terms*. We observe that the Commission rules establish an eight-year license term for SDARS space stations, which commences when the satellite is launched and put into operation.[73] Accordingly, the license terms for XM Rock and XM Roll commenced in March and May, 2001, respectively, and thus will expire in March and May 2009. XM Radio must either specifically seek to extend the license terms of these satellites prior to expiration, or must decommission the spacecraft at the end of the license terms pursuant to the Commission's post mission disposal rules.[74] The license term for each of the replacement satellites, XM-3 and XM-4, shall be eight years and will commence when each satellite is launched and put into operation.

26. We remind XM Radio that it should timely file with the Commission the information necessary for the Advance Publication, coordination, due diligence and notification of its frequency assignments pursuant to the international Radio Regulations.[75] Any radio station authorization for which coordination has not been completed may be subject to additional terms and conditions as required to effect coordination of frequency assignments with other Administrations.

D. Waiver Request

27. XM Radio requests a waiver of Section 25.210(j) of our rules, which requires that GSO FSS space stations be maintained in orbit within 0.05° of their assigned orbital longitude, unless specifically authorized otherwise by the Commission to operate with a different longitudinal tolerance,

[68] XM Radio Modification Application at 4-5. XM Radio states that it will seek further Commission approval if it later decides to move XM-Rock or XM-Roll to another orbital location. *Id.* at 5 n.11.

[69] *See supra*, para. 21.

[70] *August 20 Letter* at 2.

[71] *See supra*, para. 22.

[72] 47 C.F.R. § 25.283(a). *See also* Mitigation of Orbital Debris, *Second Report and Order*, IB Docket No. 02-54, 19 FCC Rcd 11567 (2004).

[73] 47 C.F.R. § 25.144(d).

[74] 47 C.F.R. § 25.283.

[75] 47 C.F.R. § 25.111(b).

and except as provided in Section 25.283(b) (end-of-life disposal) of the Commission's rules.[76] XM Radio seeks a waiver that would allow its replacement satellites, XM-3 and XM-4, to operate within 0.10° of their assigned orbital longitudes.[77] According to XM Radio, a waiver is justified in these instances because there are no nearby space stations operating in the S-band SDARS service links or in the X-band FSS feeder links to which XM Radio's satellite operations could cause interference.[78] In addition, XM Radio states that the costs of complying with a ±0.05° east-west station keeping tolerance (such as increased fuel to maintain a tighter tolerance) outweigh any purported benefits.[79]

28. The Commission may grant a waiver for good cause shown.[80] Waiver is appropriate if (1) special circumstances warrant a deviation from the general rule, and (2) such deviation would better serve the public interest than would strict adherence to the general rule.[81] Generally, the Commission may grant a waiver of its rules in a particular case only if the relief requested would not undermine the policy objective of the rule in question, and would otherwise serve the public interest.[82] XM Radio states that a waiver is justified because there are no other satellites at that location to which it could cause radiofrequency interference. We note that XM Radio's analysis appears limited to those spacecraft that are operating co-frequency with the XM Radio space stations and does not include other spacecraft which are not co-frequency, but may be impacted by the extended station keeping box. Without access to this additional information we are not able to conclude that the public interest justifies a waiver, given the potential impact on the operations of other satellites. Accordingly, we deny XM Radio's waiver request.[83]

29. Although we deny XM Radio's request, we do so without prejudice to XM Radio filing a modification of its license to permit its satellite to be maintained within a 0.10° station keeping box. In support of such a modification request, XM Radio should provide information regarding the identity of known satellites located at, or planned to be located at, the location proposed by XM Radio, or assigned a location in the vicinity such that the station-keeping volume of the respective satellites might overlap. XM Radio need not address every filing with the International Telecommunication Union (ITU) that meets these criteria, but should assess and address any systems reflected in ITU filings that are in operation or that XM Radio believes may be progressing toward launch, *e.g.* by the appearance of the system on a launch vehicle manifest. In the event an overlap is indicated, XM Radio should identify the measures it would take to avoid in-orbit collisions with such satellites.[84]

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[76] 47 C.F.R. § 25.210(j).

[77] XM Radio Modification Application, Appendix A at 19-20. We construe this request as one to maintain the spacecraft within 0.1° of their assigned orbital longitude, as assessed at the nodal point of the orbit.

[78] XM Radio Modification Application, Appendix A at 20.

[79] XM Radio Modification Application, Appendix A at 20.

[80] 47 C.F.R. § 1.3. *See also WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969) (*WAIT Radio*); *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990) (*Northeast Cellular*).

[81] *See Northeast Cellular*, 897 F.2d at 1166.

[82] *See WAIT Radio*, 418 F.2d at 1157.

[83] *See* Mobile Satellite Ventures Subsidiary LLC, *Order and Authorization*, DA 05-50 (Int'l Bur. rel. Jan. 10, 2005) (denying a waiver of Section 25.210(j) under analogous circumstances).

[84] Regardless of whether XM Radio seeks such a modification, we are following our standard practice of requiring submission of information regarding methods that will be used to avoid collisions with other spacecraft operating within the ± 0.05 station keeping volume. *See infra*, para. 36.

IV. ORDERING CLAUSES

30. IT IS ORDERED that the application of XM Radio Inc. to launch and operate a replacement satellite, XM-3, Call Sign S2616, at the 85° W.L. orbital location for the purpose of providing a satellite digital audio radio service in the United States in the 2332.5-2345 MHz frequency band (space-to-Earth), File No. SAT-RPL-20040212-00018, IS GRANTED.

31. IT IS FURTHER ORDERED that the application of XM Radio Inc. to launch and operate a replacement satellite, XM-4, Call Sign 2617, at the 115° W.L. orbital location for the purpose of providing a satellite digital audio radio service in the United States in the 2332.5-2345 MHz frequency band (space-to-Earth), File No. SAT-RPL-20040212-00019, IS GRANTED.

32. IT IS FURTHER ORDERED that the application of XM Radio Inc., File No. SAT-MOD-20040212-00017, to modify the authorization granted in 13 FCC Rcd 8829 (Int'l Bur. 1997), File Nos. 72-SAT-AMEND-97 *et al.*, by relocating its XM-1 satellite ("XM-Roll"), Call Sign 2118, from 85° W.L. to 115° W.L. IS GRANTED, subject to the following conditions:

a. During the relocation, XM Radio Inc. shall not operate the communications payload on the satellite.

b. During the relocation, XM Radio Inc. shall coordinate all its Tracking, Telemetry, and Command (TT&C) operations with existing geostationary satellites to ensure no unacceptable interference results from its TT&C operations.

c. During the relocation, XM-Roll shall not cause harmful interference to any other lawfully operating in-orbit satellite, and XM Radio Inc. must terminate operations on XM-Roll immediately upon notification of such interference and shall inform the Commission in writing immediately of such an event.

d. During the relocation, XM Radio Inc. is required to accept interference from other lawfully operating in-orbit satellites.

e. XM Radio Inc. must inform the Commission in writing that it has begun relocation of the satellite upon commencement of maneuvers to drift XM-Roll to 115° W.L.

33. IT IS FURTHER ORDERD that XM Radio Inc. IS AUTHORIZED to operate XM-1 ("XM-Roll") and XM-2 ("XM-Rock") at the 115° W.L. orbital location as non-transmitting (except for telemetry transmissions) in-orbit spares for the duration of the space stations' remaining license terms, subsequent to the successful launch of XM-4 to the 115° W.L. orbital location.

34. IT IS FURTHER ORDERED that XM Radio Inc. IS AUTHORIZED to launch and operate two GSO satellites at 85° W.L. and 115° W.L. capable of operating in the 7025-7075 MHz frequency band (Earth-to-space) designated for SDARS feeder-link use in accordance with technical specifications set forth in its application and consistent with our rules, unless specifically conditioned or waived herein.

35. IT IS FURTHER ORDERED that XM Radio Inc. shall prepare the necessary information, as may be required, for submission to the International Telecommunication Union (ITU) to initiate and complete the advance publication, international coordination, due diligence, and notification process of its space stations, in accordance with the ITU Radio Regulations. XM Radio Inc. shall be held responsible for all cost-recovery fees associated with these ITU filings. We also note that no protection from interference caused by radio stations authorized by other Administrations is guaranteed unless coordination and notification procedures are timely completed or, with respect to individual Administrations, by successfully completing coordination agreements. Any radio station authorization for which coordination has not been

completed may be subject to additional terms and conditions as required to effect coordination of the frequency assignments of other Administrations. *See* 47 C.F.R. § 25.111(b).

36. IT IS FURTHER ORDERED that XM Radio Inc. must provide a written statement to the Commission within 60 days of the date of this grant that identifies any known satellites located at, or planned to be located at, XM Radio Inc.'s assigned orbital locations, or assigned in the vicinity of that location such that the station keeping volume of the respective satellites might overlap, and that states the measures that will be taken to prevent in-orbit collisions with such satellites. This statement should address any licensed FCC systems, or any systems applied for and under consideration by the FCC. The statement need not address every filing with the ITU that meets these criteria, but should assess and address any systems reflected in ITU filings that are in operation or that XM Radio Inc. believes may be progressing toward launch, e.g. by the appearance of the system on a launch vehicle manifest. If XM Radio Inc. elects to rely on coordination with other operators to prevent in-orbit collisions, it shall provide a statement as to the manner in which such coordination will be effected.

37. IT IS FURTHER ORDERED that XM Radio Inc.'s request to waive Section 25.210(j) of the Commission's rules to permit XM Radio Inc. to operate its XM-3 and XM-4 satellites with an East-West station keeping tolerance of ±0.10° IS DENIED without prejudice.

38. IT IS FURTHER ORDERED that the license term for XM-3 and XM-4 is eight years and will begin on the date XM Radio Inc. certifies to the Commission that each satellite has been successfully launched and put into operation.

39. IT IS FURTHER ORDERED that XM Radio Inc. is afforded thirty days from the date of the release of this Order and Authorization to decline this authorization as conditioned.

40. This Order is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. § 0.261, and is effective upon adoption. Petitions for reconsideration under Section 1.106 or applications for review under Section 1.115 of the Commission's rules, 47 C.F.R. §§ 1.106, 1.115, may be filed within 30 days of the date of the release of this Order (see 47 C.F.R. § 1.4(b)(2)).

FEDERAL COMMUNICATIONS COMMISSION

Thomas S. Tycz
Chief
Satellite Division