

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

In the matter of	)	
	)	
Globalstar LLC	)	
	)	
Request for authority to implement an ancillary terrestrial component for the Globalstar Big LEO Mobile Satellite Service (MSS) system (Call Sign ES2115)	)	File No. SAT-MOD-20050301-00054

**ORDER AND AUTHORIZATION**

**Adopted:** January 20, 2006

**Released:** January 20, 2006

By the Chief, International Bureau

**I. INTRODUCTION**

1. In this order, we grant authority to Globalstar LLC (“GLLC”) for operation of ancillary terrestrial component (“ATC”) stations to provide services integrated with services provided via the Globalstar™ Mobile Satellite Service (“MSS”) system, using portions of the spectrum bands assigned for Globalstar MSS operation.

**II. BACKGROUND**

**A. ATC Policy and Authorization Procedures**

2. In 2003, the Commission adopted rules for licensing and operation of “ancillary terrestrial components” or ATCs – *i.e.*, terrestrial base stations and mobile terminals licensed to the operator of an MSS system for provision of radio communication services offered together with MSS services, re-using frequencies previously assigned for the licensee’s MSS operations.<sup>1</sup> The Commission concluded that authorizing such ATC operation would serve the public interest by facilitating increased network capacity, more efficient use of spectrum, extension of coverage for handset operation to places where MSS operators have previously been unable to offer reliable service, improved emergency communications, enhanced competition, and economies of

<sup>1</sup> *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; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, Report and Order and Notice of Proposed Rulemaking, FCC 03-15, 18 FCC Rcd 1962 (2003) (“*ATC Report and Order*”), modified by Order on Reconsideration, 18 FCC Rcd 13590 (2003), reconsidered in part in Mem. Opinion and Order and Second Order on Reconsideration, FCC 05-30, 20 FCC Rcd 4616 (2005) (“*ATC Second Reconsideration Order*”), further reconsideration pending.

scale in handset manufacture that would be passed on to consumers.<sup>2</sup> An MSS operator with an FCC-issued space-station license may request blanket authority for operation of ATC stations in the United States in an application for license modification.<sup>3</sup> Equipment authorization must also be obtained for ATC mobile terminals pursuant to the test-based certification procedure specified in Part 2, Subpart J of the Commission's rules before the terminals are offered or imported for sale or lease in the United States.<sup>4</sup>

3. In the *ATC Report and Order*, the Commission adopted rules establishing several prerequisites, or "gating criteria" that MSS operators must meet in order to be allowed to offer ATC. These gating criteria are set forth in Section 25.149 of the Commission's rules. To ensure that ATC will be ancillary to provision of MSS, the Commission adopted a requirement that MSS operators must provide substantial satellite service to be eligible for ATC authorization.<sup>5</sup> The Commission defined substantial satellite service as the capability of providing continuous satellite service over the entire geographic area of satellite coverage required in our rules,<sup>6</sup> maintenance of spare satellites to expeditiously replace destroyed or degraded satellites,<sup>7</sup> and commercial availability of service throughout the mandatory coverage area.<sup>8</sup> The Commission also required the offer of MSS and ATC services to be integrated.<sup>9</sup> An applicant for ATC operating authority with an already-operational MSS system must demonstrate that it is in compliance with the pertinent coverage, commercial-service availability, and replacement-satellite requirements and will comply with the integration requirement.<sup>10</sup>

## B. Globalstar Big LEO MSS Operation

4. GLLC holds an FCC space-station license for the Globalstar "Big LEO" MSS system,<sup>11</sup> which provides service in the United States and abroad via non-geostationary-orbit

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<sup>2</sup> *ATC Report and Order* at ¶¶ 2, 20-45, and 210-11.

<sup>3</sup> *Id.* at ¶240. An authorized provider of MSS in the United States via a foreign-licensed satellite can request blanket authority for U.S. ATC operation by applying for modification of an FCC reservation of spectrum or blanket license for mobile earth stations. *Id.* at ¶245. An individual, site-specific license must be obtained for any ATC base station that presents an aviation-hazard issue or for which an Environmental Assessment must be prepared. *Id.* at ¶239; also see 47 C.F.R. §§ 1.1307, 17.4, and 17.7.

<sup>4</sup> 47 C.F.R. § 25.149(c)(1) and (2). Also see 47 C.F.R. §§ 2.803, 2.901 *et seq.*, and 2.1204.

<sup>5</sup> *ATC Report and Order* at ¶ 72.

<sup>6</sup> 47 C.F.R. § 25.149(b)(1).

<sup>7</sup> 47 C.F.R. § 25.149(b)(2).

<sup>8</sup> 47 C.F.R. § 25.149(b)(3).

<sup>9</sup> 47 C.F.R. § 25.149(b)(4).

<sup>10</sup> See 47 C.F.R. § 25.149(b) and *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; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, Order on Reconsideration, FCC 03-162, 18 FCC Rcd 13590 (2003) at ¶¶10-11.

<sup>11</sup> See *Application of Loral/Qualcomm Partnership, L.P. for Authority to Construct, Launch, and Operate Globalstar, a Low Earth Orbit Satellite System to Provide Mobile Satellite Services in the 1610-1626.5 MHz/2483.5-2500 MHz Bands*, DA 95-128, 10 FCC Rcd 2333 (1995). The term "Big LEO MSS" denotes MSS systems that use assigned frequencies in the 1610-1626.5 MHz band for transmission from mobile earth stations to

satellites, using the 1610-1621.35 MHz band for transmissions from mobile earth stations to satellites and the 2483.5-2500 MHz band for transmissions from satellites to mobile earth stations. An affiliated company, Globalstar USA LLC, holds an FCC blanket license for operation of Globalstar mobile earth-station terminals and is responsible for provision of Globalstar MSS services to end users in the United States.<sup>12</sup>

5. The Globalstar Big LEO MSS system has been in continuous commercial operation in the United States for more than five years, providing voice and data services. GLLC reports that at the end of 2004 there were 133,000 Globalstar Big LEO MSS subscribers worldwide and that the customer base for Globalstar Big LEO MSS has grown at an average annual rate of 45 percent since the system's first year of operation.<sup>13</sup>

### C. ATC Application

#### 1. System Description

6. In an application for license modification filed in March 2005, GLLC requests blanket authority to operate an unlimited number of ATC base stations and dual-mode MSS/ATC user terminals.<sup>14</sup> A functional description of the proposed Globalstar ATC system, as given in the application, is set forth in the following paragraphs.

7. *Mobile Terminals* Globalstar ATC mobile terminals will be dual-mode devices that can also be used for communication via the Globalstar Big LEO satellite system. In MSS mode, the mobile terminals will operate in frequency bands assigned for Globalstar Big LEO MSS, transmitting in the 1610-1621.35 MHz band and receiving in the 2483.5-2500 MHz band. As required by Section 25.149(a)(2) of the Commission's rules,<sup>15</sup> terminal operation in ATC mode will be confined to 1610-1615.5 MHz for transmission and 2487.5-2493 MHz for reception. Handheld Globalstar MSS/ATC terminals will be equipped with two antennas: a small stub antenna with peak gain of approximately 2.0 dBi for ATC-mode operation and a larger external antenna with peak gain of approximately 3.0 dBi for operation in MSS mode.<sup>16</sup> An accessory adapter might be supplied to enable the handset to draw power from a motor vehicle's battery and use an outside antenna for MSS-mode operation to avoid signal attenuation through the vehicle's roof.<sup>17</sup> Globalstar also seeks authority for operation of fixed and vehicular dual-mode terminals with larger antennas and more powerful transmitters.<sup>18</sup>

8. Users of Globalstar MSS/ATC terminals will be able to select either ATC or MSS

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satellites.

<sup>12</sup> See *AirTouch Satellite Services US, Inc., Application for Blanket Authorization to Construct and Operate up to 500,000 Mobile Satellite Earth Terminals Through the GLOBALSTAR Mobile Satellite System*, Order and Authorization, DA 99-2010, 14 FCC Rcd 17328 (1999).

<sup>13</sup> Application File No. SAT-MOD-20050301-00054 ("GLLC ATC Application"), Exhibit A at 1.

<sup>14</sup> *Id.*

<sup>15</sup> 47 C.F.R. §25.149(a)(2).

<sup>16</sup> GLLC ATC Application, Exh. B-4 at 3.

<sup>17</sup> *Id.*, Exh. B-4 at 2.

<sup>18</sup> *Id.* at 3-4.

as the preferred mode of operation on power-up. If a terminal fails to acquire a pilot signal in the preferred mode or subsequently loses the signal, it will automatically switch modes and attempt to register in the other mode.<sup>19</sup> Once the device acquires the pilot signal and registers on the Globalstar MSS or ATC network, the user can place a call by entering a phone number and pressing a “send” button. Calls will be routed through the public switched telephone network or the Internet according to the user’s instructions. A single phone number will be assigned to each terminal for both MSS and ATC operation.<sup>20</sup> Globalstar will ensure that manufacturers of mobile terminals capable of accessing its ATC network apply for prior certification of the devices, as required by Rule Section 25.149(c), and that the devices operate in compliance with all other pertinent requirements in the Commission rules.<sup>21</sup>

9. *Base Stations* Transmitting in the 2487.5-2493 MHz band and receiving in the 1610-1615.5 MHz band, Globalstar ATC base stations will link with mobile terminals through an access network that will allow the mobile terminals to register, be paged and initiate calls. Each base station will be connected through interfaces to a mobile switching center and a packet data serving node for Internet Protocol connections.<sup>22</sup> GLLC plans to deploy fixed ATC base stations in underserved geographic regions and where reception of the Globalstar satellite signal is largely impaired by path obstruction, particularly in urban areas.<sup>23</sup> GLLC also proposes to deploy transportable ATC base stations in rural or underserved areas to meet the needs of customers requiring service on a short-term or emergency basis.<sup>24</sup> GLLC promises that, as required by Section 25.254(a)(3), it will perform whatever frequency coordination may be necessary to avoid causing interference to other systems operating on assigned frequencies in the 2450-2500 MHz band before placing any ATC base station in service, and that its base stations will operate in compliance with all other pertinent requirements in the Commission’s rules.<sup>25</sup>

10. *Air Interface Protocol* The Globalstar ATC system will use a cdma2000 air interface protocol, which will support voice communication and data services with speeds up to two million bits per second.<sup>26</sup>

11. *Self-Interference Management* There are three ways in which the Globalstar Big LEO MSS system and the Globalstar ATC system could interfere with each other. Transmissions from Globalstar ATC base stations in the 2487.5-2493 MHz band could interfere with reception of co-frequency Globalstar MSS signals in the base-stations’ coverage areas.<sup>27</sup> Likewise, Globalstar MSS-terminal transmissions in the 1610-1615.5 MHz band could interfere with reception of co-frequency Globalstar ATC transmissions at the base stations.<sup>28</sup> Moreover,

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<sup>19</sup> *Id.*, Exh. B-1 at 1-2.

<sup>20</sup> *Id.*, Exh. B-4 at 3.

<sup>21</sup> *Id.*, Exh. B.

<sup>22</sup> *Id.*, Exh. B-3 at 1.

<sup>23</sup> *Id.*, Exh. B-3 at 2.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*, Exh. B at 1-4, Exh. B-3 at 2.

<sup>26</sup> *Id.*, Exh. B-3 at 1.

<sup>27</sup> *Id.*, Exh. B-1 at 2.

<sup>28</sup> *Id.*, Exh. B-1 at 4.

simultaneous operation of a large number of Globalstar ATC mobile terminals in an ATC service area could block satellite reception of MSS signals in one or more channels from Globalstar terminals anywhere within the footprint of a satellite reception beam encompassing that area.<sup>29</sup>

12. In order to limit such self-interference and maximize overall capacity, Globalstar network control centers will dynamically allocate channel frequencies and power to satellites and ATC base stations on a beam-by-beam, minute-by-minute basis, taking into account base station locations, varying demand for each type of service, and satellite beam coverage and movement over the earth's surface.<sup>30</sup> The control centers will assign at least one channel in the 2487.5-2493 MHz band and one in the 1610-1615.5 MHz band exclusively for MSS transmission in satellite beams overlying Globalstar ATC service areas to ensure that Globalstar customers with MSS-only terminals can be served in those areas. The control centers will also limit the number of simultaneous transmissions from terminals in such overlying beams to facilitate shared use of the remaining spectrum in those bands for both MSS and ATC.<sup>31</sup> The impact of ATC terminal operation on a satellite's reception of MSS uplink transmissions will be alleviated by recovery of blocked channels by other Globalstar satellites with reception beams that overlap the affected beams but do not extend over the areas where the interfering ATC signals originate.<sup>32</sup> When beams from two satellites overlap each other in a rural region and separately extend over two different cities where Globalstar ATC service is provided, the control centers will allocate ATC channels between the service areas to ensure that in the area where the beams overlap any MSS uplink channels blocked in one beam will be available in the other.<sup>33</sup>

13. GLLC calculates that approximately 490 Globalstar ATC calls can be supported in the amount of bandwidth required for one Globalstar MSS call. Hence, GLLC contends that its proposed implementation of ATC will enhance spectrum efficiency, as the resultant ATC capacity will be much greater than the MSS capacity lost due to self-interference.

## 2. Service Plan

14. GLLC asserts that by offering ATC services along with Globalstar satellite services it can better serve existing customers and meet additional, unmet needs for integrated satellite-terrestrial services with one-number convenience that will be especially useful for subscribers who travel in both urban and rural areas. GLLC intends to improve the quality and availability of Globalstar services in urban areas by deploying ATC base stations where buildings and other structures block line-of-sight signal paths to the Globalstar satellites. GLLC estimates that a carefully designed Globalstar MSS/ATC system could support approximately 4

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<sup>29</sup> *Id.*, Exh. B-1 at 5.

<sup>30</sup> Each Globalstar satellite projects multiple downlink beams with separate footprints on the earth's surface and likewise differentiates uplink reception in an equal number of discrete geographic areas that are also loosely referred to as "beams." The deployment of multiple downlink beams and corresponding geographic differentiation in the reception of terminal transmissions, which is typical of MSS satellite systems, enables multiple re-use of spectrum assigned for transmission between satellites and mobile terminals, hence multiplying system capacity.

<sup>31</sup> *Id.*, Exh. B-1 at 2 and 4.

<sup>32</sup> *Id.*, Exh. B-1 at 5.

<sup>33</sup> GLLC ATC Application, Exh. B-1 at 3-5.

million MSS/ATC subscribers in the ten most populous US cities plus Washington, D.C. GLLC contends that deployment of Globalstar ATC base stations and dual-mode MSS/ATC terminals that can be used anywhere in the United States will facilitate provision of improved services for public safety, law enforcement, and emergency-response organizations, particularly following catastrophes that disrupt operation of local telecommunications infrastructure.

15. GLLC plans to deploy transportable ATC base stations that can be set up quickly and put into use at relatively low cost to provide telecommunications services to customers in rural and remote areas that are currently unserved or underserved by wireline and wireless telecommunications providers. Globalstar MSS/ATC customers in such areas would be able to communicate locally via the Globalstar ATC base station and with the rest of the world using the satellite component of their dual-mode terminals. GLLC adds that such transportable base stations could also be used to meet short-term needs for public-safety, military, and other security communications in areas with no pre-existing communications infrastructure or where existing infrastructure is unreliable or temporarily disabled.

16. GLLC contends that it is the only MSS operator capable of integrating ATC with an existing, first-generation MSS system in full compliance with the Commission's ATC rules and asserts that it can rapidly take advantage of the additional flexibility that grant of its ATC application would afford. GLLC points out that it has conducted demonstrations, under an experimental license, with a suitcase-sized transportable base station that enabled users with dual-mode Globalstar/GSM phones to place international calls through the public switched network. GLLC maintains that these experiments prove that Globalstar MSS/ATC can be implemented with existing technology at low cost.

### 3. Compliance with Radiation Limits

17. As required by Section 25.149(a)(5), GLLC guarantees that Globalstar ATC base stations and MSS/ATC terminals will operate in compliance with the provisions of the National Environmental Policy Act incorporated in the Commission's rules, including the provisions in Sections 1.1307(b), 1.1310, 2.1091, and 2.1093 pertaining to radio-frequency radiation exposure. The base-station antennas will typically be mounted atop tall masts and will be enclosed by perimeter security fences. Standard radiation-hazard warnings will be posted, and access to areas directly in a base station's main antenna beam will be barred except as required for maintenance by authorized engineering personnel after amplifier input signals have been blocked. GLLC will submit an analysis for each ATC base station before placing it in operation, demonstrating that levels of radiation above the maximum allowable exposure level will not exist in areas normally occupied by humans. Globalstar MSS/ATC terminals will be designed to comply with the pertinent limits specified in OET Bulletin 65 for Specific Absorption Rates and Maximum Permissible Exposure in uncontrolled environments. GLLC acknowledges that compliance with radiation-hazard limits applicable to mobile-terminal operation must be verified by testing and that the test results and a description of the testing procedures must be submitted in an application for equipment certification pursuant to Part 2, Subpart J of the Commission Rules.<sup>34</sup>

<sup>34</sup> See 47 U.S.C. §§ 2.1093(c) and (d) and 25.149(c).

## D. Related Filings

18. The Commission's International Bureau, Satellite Division placed the Globalstar ATC application on public notice<sup>35</sup> and subsequently granted a request to designate the ensuing proceeding as "permit-but-disclose" for purposes of the Commission's *ex parte* rules.<sup>36</sup> The Wireless Communications Association International, Inc. ("WCA") filed comments on the application, and the Society of Broadcast Engineers ("SBE") filed an "Informal Objection."<sup>37</sup> GLLC filed a consolidated opposition to those pleadings, and WCA and SBE filed separate replies.<sup>38</sup> Informal comments on the application were also received from an Associate Administrator of the National Telecommunications and Information Administration ("NTIA") in a letter that was placed in the record.<sup>39</sup> In other letters of record, GLLC certified that there had been no material change of its ownership or control since last report<sup>40</sup> and Mobile Satellite Ventures Subsidiary LLC ("MSV") urged the Commission to include a clarifying statement concerning MSS data-transmission rates in any grant of authority based on the current application.<sup>41</sup> Finally, GLLC filed a response to the NTIA's comments on October 17, 2005.<sup>42</sup>

## III. DISCUSSION

### A. Protection of Radionavigation-Satellite Services

19. Section 25.254(a)(4) of the Commission's rules prescribes the following limits on the radiated power of out-of-band emissions in the 1559-1610 MHz band from ATC base stations licensed to transmit on assigned frequencies in the 2483.5-2500 MHz band:

[Such base stations] shall not generate EIRP density, averaged over any two-millisecond active transmission interval, greater than -70 dBW/MHz in the 1559–1610 MHz band[, and] [t]he EIRP, averaged over any two millisecond active

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<sup>35</sup> Public Notice, Report No. SAT-00284 (Apr. 15, 2005).

<sup>36</sup> Public Notice, Report No. SAT-00306 (July 8, 2005).

<sup>37</sup> Comments of the Wireless Communications Association International, Inc. filed May 16, 2005; Informal Objection of the Society of Broadcast Engineers, Inc. filed May 16, 2005.

<sup>38</sup> Reply of Globalstar LLC and Globalstar USA, LLC filed May 26, 2005; Response to Reply of Globalstar to the Informal Objection of the Society of Broadcast Engineers, Inc., filed July 11, 2005; Reply Comments of the Wireless Communications Association International, Inc. filed June 8, 2005. *Also see* letter to the FCC Secretary dated Aug. 18, 2005 from Josh L. Roland, Counsel to Globalstar LLC (*ex parte* notice) and letter to the FCC Secretary dated Aug. 26, 2005 from Paul J. Sinderbrand, Counsel for the WCA.

<sup>39</sup> Letter to Donald Abelson, Chief, International Bureau, from Frederick R. Wentland, Associate Administrator, Office of Spectrum Management, dated May 25, 2005 ("NTIA Letter").

<sup>40</sup> Letter to the FCC Secretary from William T. Lake, Counsel to Globalstar LLC and Globalstar USA LLC, dated Sept. 9, 2005.

<sup>41</sup> Letter to the FCC Secretary from Jennifer A. Manner, Vice President, Regulatory Affairs, dated Sept. 29, 2005 ("MSV Letter").

<sup>42</sup> Letter to the FCC Secretary from Josh L. Roland, Counsel to Globalstar LLC, dated Oct. 17, 2005, with attached letter from GLLC's president.

transmission interval, of discrete out-of band emissions of less than 700 Hz bandwidth from such base stations shall not exceed -80 dBW in ... [that] band.

Section 25.254(b)(4) prescribes similar limits for ATC mobile terminals licensed to transmit in assigned frequencies in the 1610-1626.5 MHz band:

[Such mobile terminals] shall not generate EIRP density, averaged over any two-millisecond active transmission interval, greater than -70 dBW/MHz in the 1559–1605 MHz band or greater than a level determined by linear interpolation in the 1605–1610 MHz band, from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz. The EIRP, averaged over any two-millisecond active transmission interval, of discrete out-of-band emissions of less than 700 Hz bandwidth from such mobile terminals shall not exceed -80 dBW in the 1559–1605 MHz band or exceed a level determined by linear interpolation in the 1605-1610 MHz band, from -80 dBW at 1605 MHz to -20 dBW at 1610 MHz. The EIRP density of carrier-offstate emissions from such mobile terminals shall not exceed -80 dBW/MHz in the 1559–1610 MHz band, averaged over a two-millisecond interval.

Section 25.216(c) prescribes emission limits for new mobile earth stations with assigned transmission frequencies between 1610 MHz and 1660.5 MHz that are identical to the limits specified in Section 25.254(b)(4).

20. The Commission adopted these emission limits to prevent interference with reception of signals from radionavigation satellites in the 1559-1610 MHz band. The U.S. Government's Global Positioning System ("GPS") satellites operate in this band, transmitting radionavigation signals for general civilian use in a one-megahertz band centered on 1575.42 MHz and a coded signal primarily for military use in a ten-megahertz band also centered on the 1575.42 MHz carrier frequency.

21. In comments filed in the ATC rulemaking proceeding, the NTIA advocated adoption of stricter Radionavigation Satellite Service ("RNSS") band emission limits for ATC base stations and mobile terminals than the Commission had previously prescribed for MSS terminals in Section 25.216 of the rules. The Commission declined to adopt such stricter limits for ATC transmitters in the *ATC Report and Order* because it did not find a sufficient basis in the record for doing so.<sup>43</sup> In response to a petition for reconsideration, however, the Commission said that it intended to discuss protection requirements for GPS with other Federal agencies through participation in an interagency Executive Committee.<sup>44</sup> The Commission noted that MSV, the only MSS operator that had previously received authority for ATC operation, had voluntarily agreed to meet stricter emission limits for its ATC transmitters consistent with the NTIA's recommendations.<sup>45</sup> The Commission said that if it received more ATC applications prior to final resolution of GPS protection issues it would ensure adequate protection for GPS

<sup>43</sup> *ATC Report and Order* at ¶¶ 126, 182, and 199.

<sup>44</sup> *ATC Second Reconsideration Order* at ¶70.

<sup>45</sup> *Id.* at ¶71.



through ad hoc coordination with the NTIA.<sup>46</sup>

22. GLLC stated in its ATC application that the proposed Globalstar ATC base stations would operate in compliance with the emission limits currently prescribed in Section 25.254(a)(4) and that Globalstar MSS/ATC mobile terminals would operate in compliance with the limits currently prescribed in Sections 25.216(c) and 25.254(b)(4).<sup>47</sup> In his letter of May 25, 2005, the NTIA's Associate Administrator for Spectrum Management recommended that ATC mobile terminals be required to meet stricter limits on RNSS-band emissions than the Commission's rules currently prescribe in view of the likelihood that ATC mobile terminals will be deployed in great numbers and because of the development of GPS technologies for processing low-level signals.<sup>48</sup> Specifically, the Associate Administrator recommended that any grant of authority for Globalstar ATC operation be conditioned to require suppression of emissions from ATC mobile terminals to -90 dBW/MHz or less in the 1559-1605 MHz band and to levels in the 1605-1610 MHz band determined by linear interpolation from -90 dBW/MHz at 1605 MHz to -42 dBW/MHz at 1610 MHz.<sup>49</sup> Alternatively, the Associate Administrator recommended that the Commission withhold authority for operation of Globalstar ATC mobile terminals pending the outcome of interagency discussions regarding interference protection for GPS and resolution of any ensuing rulemaking.<sup>50</sup>

23. In letters filed on October 17 and December 27, 2005,<sup>51</sup> GLLC reported that it had agreed in discussions with the NTIA to meet stricter ATC mobile-terminal emission limits than it had originally proposed, notwithstanding that the originally-proposed limits were consistent with the Commission's current rules. Specifically, GLLC said that Globalstar ATC mobile terminals placed into service before 2012 would meet the following limits on RNSS-band emissions.

Frequency (MHz)	ATC Mobile Terminal EIRP Spectral Density	
	dBW/MHz	dBW/kHz
1605-1610	-85 to -42 determined by linear interpolation	-95 to -52 determined by linear interpolation
1600-1605	-85	-95
1590-1600	-90 to -85 determined by linear interpolation	-100 to -95 determined by linear interpolation

<sup>46</sup> *Id.*

<sup>47</sup> GLLC ATC Application, Exh. B-6.

<sup>48</sup> NTIA Letter at 4.

<sup>49</sup> *Id.* at 6.

<sup>50</sup> *Id.* at 6.

<sup>51</sup> Letter to the FCC Secretary from Josh L. Roland, Counsel to Globalstar LLC, dated Oct. 17, 2005 with attached letter from Anthony J. Navarra, President; letter to the FCC Secretary from Josh L. Roland dated Dec. 27, 2005.

1559-1590	-90	-100
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Further, GLLC represented that Globalstar ATC mobile terminals placed into service after 2012 would meet the following limits:

Frequency (MHz)	ATC Mobile Terminal EIRP Spectral Density	
	dBW/MHz	dBW/kHz
1605-1610	-95 to -47 determined by linear interpolation	-105 to -57 determined by linear interpolation
1559-1605	-95	-105

24. As it appears that these proposed emission limits for Globalstar ATC mobile terminals are acceptable both to GLLC and the NTIA, we conclude that it will serve the public interest to incorporate them in the terms of the license granted here.

## B. Transportable Base Stations

25. As noted above, GLLC plans to deploy transportable ATC base stations to provide local and long-distance telephone service to customers in remote and rural areas where access to wireline or wireless telephone service is currently limited or nonexistent. The NTIA contends that this plan seems inconsistent with the ostensible purpose of ATC. According to the NTIA, the Commission indicated in the *ATC Report and Order* that the only appropriate uses for ATC are to supplement MSS coverage in urban areas and inside buildings where the satellite signals are blocked by structural attenuation. The NTIA therefore recommends that the Commission authorize deployment of transportable Globalstar base stations only for provision of service to public-safety organizations.<sup>52</sup>

26. The Commission found in the *ATC Report and Order* that MSS operators could greatly increase their capacity to serve customers in urban areas by re-using their assigned MSS spectrum for provision of integrated ATC services, and the Commission identified this as one of the principal potential public-interest benefits of permitting ATC operation.<sup>53</sup> The Commission did not prohibit deployment of ATC base stations in rural areas. Rather, the Commission assumed that ATC base stations will be installed in places where reception of MSS satellite signals is substantially affected by blocking or where there is unmet consumer demand for more communication capacity than an MSS operator could provide via satellite.<sup>54</sup> The latter – *i.e.*, deployment in geographic markets that cannot be adequately served with available MSS capacity

<sup>52</sup> NTIA Letter at 5-6.

<sup>53</sup> *ATC Report and Order* at ¶23.

<sup>54</sup> *ATC Second Reconsideration Order* at ¶27.

– is consistent with GLLC’s proposal to deploy transportable ATC base stations to provide local and long distance voice and data services “to a relatively high density of users” in rural and remote areas “that are unserved or underserved by existing wireline and wireless telecommunications providers.” Accordingly, GLLC may deploy base stations in rural areas for either public-safety or non-public-safety communications provided that it complies with the requirements for geographic and temporal coverage and all other pertinent gating requirements.

### C. Protection of Television Broadcast Auxiliary Service

27. The Commission has issued no new licenses for terrestrial radio operation in the 2483.5-2500 MHz band since 1985, but stations in the Television Broadcast Auxiliary Service (“BAS”) still operate in that band under grandfathered licenses.<sup>55</sup> Section 25.254(a)(3) of the Commission’s rules, adopted in the ATC rulemaking, provides that an applicant for license authority for ATC operation in the Big LEO MSS bands must give assurance that it will “take [any] steps necessary ... through frequency coordination” to avoid causing interference to other services operating on assigned frequencies in the 2450-2500 MHz band.<sup>56</sup> In response to a contention that ATC base-station operation could not be successfully coordinated with operation of co-frequency BAS stations in the same locality, the Commission concluded in the *ATC Second Reconsideration Order* that parties with grandfathered BAS licenses are entitled to operate free from harmful interference from ATC operation and hence that an ATC licensee must either coordinate base station operation in the 2483.5-2500 MHz band with BAS operation or resolve relevant interference issues in some other manner through negotiation with BAS licensees.<sup>57</sup> As required by Section 25.254(a)(3), GLLC declares in its ATC application that it will take any steps necessary to ensure through frequency coordination that its ATC base stations do not harmfully interfere with BAS operation.<sup>58</sup>

28. SBE asserts in its Informal Objection that BAS Channel A10, which includes the 2487.5-2493 MHz band that GLLC requests for ATC base-station transmission, is used in most of the largest U.S. cities by mobile/itinerant TV Pickup stations that are frequently deployed for on-the-spot coverage of unscheduled news events. SBE contends that it is infeasible for GLLC to coordinate operation of ATC base stations to prevent interference with co-frequency operation of such TV pickup stations in the same locality. Therefore, SBE maintains that the Commission should refrain from granting authority for operation of Globalstar ATC base stations in cities where grandfathered TV pickup stations operate on Channel A10, unless and until such BAS operation is relocated to a frequency band below 1486 MHz, as SBE has proposed in a petition for reconsideration of the *Big LEO Spectrum Sharing Order*.<sup>59</sup>

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<sup>55</sup> See *ATC Report and Order*, Appendix C3, §4.2.1. Other grandfathered incumbents in the 2483.5-2500 MHz band include stations in the fixed and mobile services that are licensed under Part 90 (Private Land Mobile Radio Services) or Part 101 (Fixed Microwave Services). See 47 C.F.R. §2.106, Footnote NG147.

<sup>56</sup> 47 C.F.R. § 25.254(b)(3).

<sup>57</sup> *ATC Second Reconsideration Order* at ¶94.

<sup>58</sup> Globalstar ATC Application, Exh. B at 4.

<sup>59</sup> Informal Objection of the Society of Broadcast Engineers, Inc. filed May 16, 2005 (“SBE Objection”) at 4. See

29. WCA agrees with SBE that it is infeasible for GLLC to protect BAS operation in Channel A10 through coordination. WCA therefore urges us to hold GLLC's ATC application in abeyance until the Commission rules on SBE's proposal for relocating BAS Channel A10.<sup>60</sup> In the alternative, WCA contends that if authority for Globalstar ATC operation is granted prior to disposition of the relocation proposal the authorization should be conditioned on compliance with any pertinent band-clearing obligation subsequently established by the Commission.

30. In response, GLLC reaffirms that it intends to "perform any required frequency coordination ... to avoid causing interference from an ATC base station to other services sharing the 2450-2500 MHz band" and will comply with any pertinent rule amendment adopted hereafter.<sup>61</sup> GLLC contends that the pendency of SBE's petition for reconsideration of the *Big LEO Spectrum Sharing Order* does not warrant postponement of action on GLLC's ATC application. GLLC notes, in this regard, that the International Bureau granted MSV's ATC application while petitions for reconsideration of relevant ATC rules were pending, with a proviso that the authorization would be subject to any further restriction adopted on reconsideration.<sup>62</sup> GLLC maintains that withholding grant of its ATC application would disserve the public interest by delaying provision of new services to customers whose needs are currently unmet.

31. The Commission clearly indicated in the *ATC Second Reconsideration Order* that BAS licensees are entitled to operate grandfathered stations in the 2483.5-2500 MHz band free from harmful interference from co-frequency ATC base stations that the BAS licensees have not agreed to accept. Thus, it is the ATC operator, not BAS licensees, that bears the risk of any difficulty of coordinating base-station operation in the 2487.5-2493 MHz band with BAS stations operating in the same vicinity under a grandfathered license. Should it prove infeasible for GLLC to protect grandfathered BAS operation in a given locality through coordination, then GLLC will have to refrain from operating any base station in a way that would harmfully interfere with such BAS operation, unless the resultant interference is permissible under the

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SBE Petition for Reconsideration in IB Docket No. 02-364, filed Sept. 8, 2004, and *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, Fourth Report and Order and Further Notice of Proposed Rulemaking, FCC 04-134, 19 FCC Rcd 13386 (2004) ("*Big LEO Spectrum Sharing Order*"), *recon pending*. Also see Petition of Wireless Communications Ass'n Int'l for Reconsideration, IB Docket No. 02-364, filed Sept. 8, 2004.

<sup>60</sup> Comments of the Wireless Communications Association International, Inc. filed on May 19, 2005, at 6-7. WCA, which describes itself as "the trade association of the wireless broadband industry," agrees with SBE that BAS Channel A10 should be relocated, primarily because WCA believes that BRS licensees cannot compatibly share the 2496-2500 MHz band with grandfathered BAS licensees. *Id.* at 2-3.

<sup>61</sup> Reply of Globalstar LLC and Globalstar USA, LLC filed May 26, 2005, at 3.

<sup>62</sup> *Id.* at 4, citing *Mobile Satellite Ventures Subsidiary LLC, Application for Minor Modification of Space Station License for AMSC-1; Application for Minor Modification of Blanket License for Authority to Operate Mobile Earth Terminals with MSAT-1 (Order and Authorization)*, DA 04-3553, 19 FCC Rcd 22144 (2004) ("*MSV ATC Order*") at ¶95.

terms of an agreement with the affected BAS licensee(s).<sup>63</sup> We therefore agree with GLLC that there is no need to withhold grant of its ATC application to avoid prejudice to terrestrial licensees. Accordingly, we deny the relief that SBE and WCA request.

#### **D. Protection of Other Grandfathered Services, Including the Public Safety Service**

32. In addition to BAS stations, there are other fixed and mobile facilities licensed on a grandfathered basis in the upper portions of the 2.4 GHz band where their receivers could potentially receive overload interference from ATC base stations operating in the 2487.5-2493 MHz band.<sup>64</sup> Although no comment was filed in this proceeding concerning protection of these other grandfathered operations, we remind GLLC that it must, prior to commencing base-station operation, take such steps as may be necessary to prevent adjacent-channel and brute-force overload interference to any fixed or mobile facilities operating in the 2450-2500 MHz band under grandfathered licenses identified in the FCC's Universal Licensing System.<sup>65</sup>

#### **E. Performance Parameters for MSS-Mode Operation**

33. As mentioned previously, GLLC proposes to deliver ATC services via dual-mode user terminals that can also be used for MSS communication via the Globalstar satellite system. Although GLLC's application includes specifications for maximum radiated power and antenna gain for terminal operation in MSS mode, the application states that because the terminal design was not fully developed at the time of filing the specified values merely represent expected performance.<sup>66</sup> Noting this, MSV observes that terminal performance in MSS mode could have a material bearing on compliance with the Commission's requirement that provision of ATC services be integrated with provision of MSS, as the Bureau recognized when granting MSV's ATC authorization.<sup>67</sup> MSV therefore contends that an order granting GLLC's ATC application should stipulate that GLLC may not provide ATC service via user terminals with MSS-mode performance parameters different from those specified in the application without obtaining prior approval from the Commission. MSV also contends that GLLC would have to obtain prior approval before providing service via MSS/ATC terminals with a lower average MSS data-transmission rate than 2.4 kbps, which was specified in link budgets in the application for the Globalstar Big LEO MSS space-station license.<sup>68</sup>

34. The authority granted here does not sanction operation of terminals with MSS-

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<sup>63</sup> See *ATC Second Reconsideration Order* at ¶94 (ATC licensees may either coordinate with BAS licensees or negotiate with them for some other solution to potential interference problems).

<sup>64</sup> *ATC Report and Order* at ¶203.

<sup>65</sup> See 47 C.F.R. § 25.254(a)(3) and *ATC Report and Order* at ¶203. GLLC has acknowledged this obligation in general terms. GLLC ATC Application, Exh. B at 4; Reply of Globalstar LLC and Globalstar USA, LLC filed May 26, 2005, at 3 (confirming intention to "perform any required frequency coordination ... to avoid causing harmful interference from an ATC base station to other services sharing the 2450-2500 MHz band").

<sup>66</sup> GLLC ATC Application, Exh. B-4 at 1.

<sup>67</sup> MSV Letter at 1. See *MSV ATC Order* at ¶¶ 28-33.

<sup>68</sup> Application of Loral/Qualcomm Partnership, L.P. for Authority to Construct, Launch, and Operate Globalstar, File No. SAT-AMD-19941116-00077 (Nov. 15, 1994), Tables 4-2 to 4-5.

mode performance parameters inconsistent with those specified in the application before us or with other relevant parameters incorporated by reference in the Globalstar Big LEO MSS licenses by the terms of the authorization orders.<sup>69</sup> GLLC may subsequently request authority for operation with such variant specifications by filing an application for modification of license.

## F. In-Orbit Spare

35. Section 25.149(b)(2)(i) of the Commission's rules provides that "[o]perational NGSO [*i.e.*, non-geostationary-orbit] MSS ATC systems shall maintain an in-orbit spare satellite." The space-segment license for the Globalstar Big LEO MSS system authorizes operation of forty NGSO space stations. GLLC stated in its ATC application that the Globalstar Big LEO constellation "consists of 40 operational satellites, of which 4 are temporarily out of service while recovering from [technical] anomalies ... plus two in-plane spares that are currently operational" and added that eight more Globalstar Big LEO satellites were in ground storage.<sup>70</sup> In an annual report filed in October 2005, GLLC disclosed that one of the operational Globalstar Big LEO satellites failed in August 2005 and could not be repaired and that several more of the Globalstar satellites currently in orbit were temporarily out of service while undergoing diagnostic and recovery procedures.<sup>71</sup> In a letter filed more recently, GLLC acknowledged that it does not currently have an in-orbit spare but said that

it is likely that satellites temporarily out of service will be recovered prior to the planned initiation of ATC service during the latter part of 2006. Furthermore, Globalstar will launch at least four, and perhaps all eight, of its ground spares beginning in the first or second quarter of 2007, at which time it expects to have multiple in-orbit spares once again.<sup>72</sup>

36. Section 25.149(b) requires an applicant for ATC authority to "demonstrate ... through certification" that it "does or will comply" with the pertinent spare-satellite rule.<sup>73</sup> GLLC has satisfied this requirement by indicating in its application and in the subsequent letter on point that it does not intend to commence ATC operation before a serviceable in-orbit spare is available for the Globalstar Big LEO MSS system.<sup>74</sup> In the event that GLLC fails to achieve compliance with the in-orbit-spare requirement prior to the planned inauguration of ATC

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<sup>69</sup> See *Application of Loral/Qualcomm Partnership, L.P. for Authority to Construct, Launch, and Operate Globalstar, a Low Earth Orbit Satellite System to Provide Mobile Satellite Services in the 1610-1626.5 MHz/2483.5-2500 MHz Bands*, DA 95-128, 10 FCC Rcd 2333 (1995) at ¶25, and *AirTouch Satellite Services US, Inc., Application for Blanket Authorization to Construct and Operate up to 500,000 Mobile Satellite Earth Terminals Through the GLOBALSTAR Mobile Satellite System (Order and Authorization)*, DA 99-2010, 14 FCC Rcd 17328 (1999) at ¶24.

<sup>70</sup> GLLC ATC Application, Exh. B at 2.

<sup>71</sup> Globalstar LLC Annual MSS Report for S2115 (Oct. 17, 2005).

<sup>72</sup> Letter to the FCC Secretary dated Dec. 13, 2005 from William F. Adler, Vice President-Legal & Regulatory Affairs. GLLC conditionally requests an interim waiver, in the event we construe the NGSO-in-orbit-spare rule to require that an in-orbit spare be available at the time when an ATC authorization is granted.

<sup>73</sup> See 47 C.F.R. § 25.149(b).

<sup>74</sup> Accordingly, we need not address GlobalStar's request for waiver of Section 25.149(b)(2)(i).

service, it will have to postpone commencement of ATC operation pending compliance or disposition of a further waiver request.

### G. Protection of Radio Astronomy

37. ATC operators are subject to technical and procedural requirements prescribed in Sections 1.924 and 25.203(e)-(g) of the Commission's rules for interference protection for FCC monitoring stations and radio-astronomy observation at sites in West Virginia, Colorado, and Puerto Rico. GLLC declares that it will comply with these requirements.<sup>75</sup>

38. Section 25.213 of the rules prescribes technical requirements for operation of Big LEO mobile earth stations designed to protect radio astronomy observation in the 1610.6-1613.8 MHz band. By incorporation in Section 25.254(b)(1), these requirements also apply to operation of ATC mobile terminals that transmit on assigned frequencies in the 1610-1626.5 MHz band. GLLC declares that "[t]he Globalstar [MSS-]ATC system" will operate in compliance with these requirements.

39. GLLC explains in the application that the Globalstar Big LEO System determines the location of Globalstar MSS terminals and controls channel assignments to terminals operating in the vicinity of protected radio astronomy sites so as to ensure compliance with Section 25.213.<sup>76</sup> GLLC asserts that terminal location information obtained when ATC calls are initiated will similarly be used to avoid assigning ATC channels in the 1610.6-1613.8 MHz band to terminals within 100 km from the radio astronomy sites listed in Section 25.213(a)(1)(i), or 30 km from the sites listed in Section 25.213(a)(1)(ii), during scheduled radio astronomy observation in that band. Section 25.213(a)(1) precludes transmission in the 1610.6-1613.8 MHz band, however, when mobile terminals are within 160 km of the sites listed in subparagraph (i) or 50 km of the sites listed in subparagraph (ii). The distances that GLLC specifies pertain, rather, to terminal transmission in the adjacent 1613.8-1615.8 MHz band. GLLC's apparently inadvertent mis-specification of the distances does not override the rule's requirements and will not excuse non-compliance.

40. GLCC reports that there is a binding coordination agreement in effect with the National Science Foundation pertaining to transmission by Globalstar mobile earth stations in aircraft.<sup>77</sup> The Agreement specifies power flux density limits, separation distances as a function of aircraft altitude, and limits on out-of-band emissions for protection of scheduled radio astronomy observation in the 1610.6-1613.8 MHz band at sites listed in Sections 25.213(a)(1)(i) and 25.213(a)(1)(ii). We construe GLLC's inclusion of this information in the ATC application to mean that any Globalstar ATC terminals in aircraft will operate in conformance with the requirements that the agreement specifies for operation of mobile earth stations aboard aircraft.

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<sup>75</sup> GLLC ATC Application, Exh. B at 3, Exh. B-5 at 2.

<sup>76</sup> *Id.*, Exh. B-5 at 1.

<sup>77</sup> *Id.*, Exh. B-5 at 2.

## H. 911 Service

41. Globalstar proposes to provide CMRS services with its ATC base stations.<sup>78</sup> Accordingly, Globalstar's proposed ATC service is required by this Order and Authorization to meet the 911 requirements specified in Section 20.18 of the Commission's Rules.<sup>79</sup> The satellite component of Globalstar's integrated MSS/ATC service offering is subject to Section 25.284 of the Commission's Rules, requiring emergency call center service.<sup>80</sup>

## IV. CONCLUSION

42. Based on review of the application and other documents of record, we find, subject to the reservation in Paragraph 36, above, that GLLC has made a satisfactory initial showing of compliance with the Commission's pertinent gating requirements,<sup>81</sup> that GLLC is qualified to hold the requested authorization, and that grant of its application, subject to the conditions specified herein, will serve the public interest, convenience, and necessity.

## V. ORDERING CLAUSES

43. Accordingly, pursuant to Section 309 of the Communications Act, 47 U.S.C. § 309, and Section 0.261 of the Commission's rules, 47 C.F.R. § 0.261, IT IS ORDERED that Application File No. SAT-MOD-20050301-00054 IS GRANTED and GLLC IS AUTHORIZED to operate ATC base stations and mobile terminals in accordance with the terms, conditions, and technical specifications set forth in its application, except as otherwise provided herein, and in compliance with the Commission's rules.

44. This authorization will expire concurrently with the space-station license for the Globalstar Big LEO MSS system and is subject to the following conditions:

The licensee shall file a report disclosing the number of currently-functional space stations and the number of currently serviceable in-orbit spares in the Globalstar MSS satellite constellation ninety days prior to GlobalStar's planned commencement of

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<sup>78</sup> See 47 C.F.R. § 20.3.

<sup>79</sup> See 47 C.F.R. § 20.9(a)(14) and *ATC Report and Order* at ¶243 (“[i]f MSS licensees seek to provide terrestrial mobile service in MSS bands, then the terrestrial component of the MSS ATC service shall be subject to the same regulatory treatment as any other operator providing the same or similar services in any other band”). See also 47 C.F.R. § 20.18.

<sup>80</sup> See 47 C.F.R. § 25.284. See also *Revision of the Commission's Rules to Ensure Compatibility With Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd 25340 (2003) (seeking comment on further improving 911 service by satellite CMRS providers) (“E911 Scope Order and FNPRM”).

<sup>81</sup> See GLLC ATC Application, Exh. B (certifying compliance with specific provisions of 47 C.F.R. §25.149), Exh. B-1 (proposing use of dual-mode MSS/ATC terminals and explaining how self-interference will be managed), and Exh. B-4 (describing terminal operation).



commercial operation pursuant to this authorization. GlobalStar shall not commence ATC operations until GlobalStar meets the in-orbit spare-satellite requirement in Section 25.149(b)(2)(i) or obtains a waiver of that requirement.

ATC mobile terminal operation pursuant to this authorization shall comport with the emission limits specified in Paragraph 23, above.

ATC services offered as Commercial Mobile Radio Services shall be provided in compliance with the requirements specified in Section 20.18(b)-(m) of the Commission's Rules, 47 C.F.R. § 20.18(b)-(m).

45. Grant of this application is without prejudice to any action in pending rule making proceedings concerning 911 and E911 obligations, including the *E911 Scope Order and FNPRM, supra*, and *E911 Requirements for IP-Enabled Service Providers*, WC Docket No. 05-196, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245 (2005).

46. GLLC may decline this authorization as conditioned within 30 days from the date of release of this order. Failure to respond within that period will constitute formal acceptance of the authorization as conditioned.

47. IT IS FURTHER ORDERED that the requests in the Informal Objection of the Society of Broadcast Engineers filed on May 16, 2005 and the Comments of the Wireless Communications Association International, Inc., also filed on May 16, 2005, ARE DENIED.

48. This order is effective upon release. Petitions for reconsideration or applications for review may be filed within thirty days of the release date.<sup>82</sup>

FEDERAL COMMUNICATIONS COMMISSION

Donald Abelson  
Chief, International Bureau

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<sup>82</sup> See 47 C.F.R. §§ 1.4(b)(2), 1.106, and 1.115.