

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

In the Matter of )  
 )  
Comprehensive Review of Licensing and ) IB Docket No. 12-267  
Operating Rules for Satellite Services )

SECOND REPORT AND ORDER

Adopted: December 17, 2015

Released: December 17, 2015

By the Commission: Chairman Wheeler and Commissioners Clyburn, Rosenworcel, Pai and O’Reilly  
issuing separate statements.

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## I. INTRODUCTION

1. In this Second Report and Order, we adopt comprehensive changes to Part 25 of the Federal Communications Commission’s rules, which governs licensing and operation of space stations and earth stations for the provision of satellite communication services.<sup>1</sup> These changes will update and clarify our rules and reduce burdens on applicants, licensees, and the Commission, facilitating more rapid and efficient deployment of satellite services to the public.

## II. EXECUTIVE SUMMARY

2. This Second Report and Order adopts numerous revisions to our rules and policies to streamline the Commission’s regulation of satellite services. Three revisions are most significant. First, to facilitate international frequency coordination of new U.S. satellite networks, the Report and Order

<sup>1</sup> 47 C.F.R. Part 25, Satellite Communications.

adopts a process under which the Commission will enable applicants to “reserve” orbital and spectrum resources for a proposed satellite network much earlier than before, by allowing the early submission of coordination information to the International Telecommunication Union (ITU).

3. Second, the Report and Order eliminates all of the space station construction milestones, except the requirement to bring a space station into operation at the assigned location within a specified period of time. Also, in order to provide better incentives against spectrum warehousing, the order modifies the space station bond requirement to increase liability over time. These measures will significantly reduce the burden for licensees and the Commission associated with the showings of compliance under the Commission’s satellite construction and deployment milestone rules, while still maintaining necessary protections against spectrum warehousing.

4. Third, the Report and Order refines the Commission’s current two-degree spacing policy to update certain technical parameters and to better support the continuity of service to small dishes that exceed certain “default” two-degree spacing coordination limits.

5. In addition, the Report and Order simplifies, eliminates, updates, or clarifies numerous rules, definitions or technical terms throughout Part 25. Most notably, we:

- Expand options for simplified earth station licensing.
- Adopt technology-neutral routine limits on earth station transmissions.
- Adopt a single, flexible aggregate limit on earth station transmissions.
- Expand “Permitted List” to all GSO FSS bands with routinely licensed stations.
- Allow replacement satellites to be located within  $\pm 0.15^\circ$  of the satellite to be replaced.

6. These comprehensive changes to the Commission’s rules for licensing and operation of space and earth stations providing satellite communications services will significantly reduce regulatory burdens and costs by making satellite space and earth station licensing easier and more efficient.

### III. BACKGROUND

7. In September 2012, the Commission began this proceeding to pursue the first wholesale examination of its rules governing satellite services in over 15 years.<sup>2</sup> One year later, with broad

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<sup>2</sup> *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Notice of Proposed Rulemaking, 27 FCC Rcd 11619 (2012) (2012 NPRM). The last comprehensive review had taken place in 1996, see *Streamlining the Commission’s Rules and Regulations for Satellite Application and Licensing Procedures*, IB Docket No. 95-117, Report and Order, 11 FCC Rcd 21581 (1996) (1996 Streamlining Order). In the time between these comprehensive reviews, the Commission has addressed developments in the satellite industry through a number of proceedings focused on particular new services or otherwise more narrow in scope. See, e.g., *Amendment of the Commission’s Space Station Licensing Rules and Policies*, IB Docket No. 02-34, First Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 10760 (2003) (*Space Station Licensing Reform Order*); *2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission’s Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations*, *Amendment of Part 25 of the Commission’s Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacings and to Revise Application Procedures for Satellite Communication Services*, Fifth Report and Order in IB Docket No. 00-248 and Third Report and Order in CC Docket No. 86-496, 20 FCC Rcd 5666 (2005) (*Earth Station Streamlining Fifth Report and Order*); *Establishment of Policies and Service Rules for the Broadcasting-Satellite Service at the 17.3-17.7 GHz Frequency Band and at the 17.7-17.8 GHz Frequency Band Internationally, and at the 24.75-25.25 GHz Frequency Band for Fixed Satellite Services Providing Feeder Links to the Broadcasting-Satellite Service and for the Satellite Services Operating Bi-Directionally in the 17.3-17.8 GHz Frequency Band*, IB Docket No. 06-123, Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 8842 (2007) (17/24 GHz BSS Order).

encouragement from stakeholders, the Commission revised over 150 rule provisions.<sup>3</sup> We deleted, updated, or clarified requirements in order to ease administrative burdens and to afford space station and earth station operators flexibility, consistent with public interest objectives including minimizing harmful interference.

8. In September 2014, the Commission adopted a Further Notice of Proposed Rulemaking in this proceeding.<sup>4</sup> The *Further Notice* explored some recommendations made in response to the 2012 *NPRM* which could not have properly been adopted in the 2013 *Report and Order*. It also explored recommendations made by an FCC staff working group concerning satellite-service regulation,<sup>5</sup> and further proposals developed by an SIA working group and the staff of the International Bureau. In response to the *Further Notice*, 18 parties filed comments, and 13 parties filed reply comments.<sup>6</sup>

#### IV. DISCUSSION

9. Commenters on the *Further Notice* generally applaud the Commission for its determination to overhaul Part 25. The parties agree with, or do not oppose, many of the changes proposed in the *Further Notice*, and we generally adopt these rule changes. We focus below on the proposed rule changes that commenters oppose or recommend modification of, and on recommendations for further changes and responses to questions raised in the *Further Notice*. Following the structure of the *Further Notice*, we first address proposals involving changes in more than one rule Section and then address proposed changes in the remaining rules in the order in which they appear in Part 25.

##### A. ITU Filings for Space Stations

10. In this Section we adopt an optional, two-step application process for geostationary-satellite orbit (GSO) space station operations. Under this procedure, parties seeking to provide fixed-satellite service (FSS) or 17/24 GHz Broadcasting-Satellite Service (BSS) may submit advance publication of information (API)<sup>7</sup> and Coordination Request filings to the Commission for forwarding to the ITU before they submit a complete license application. The first step in the licensing procedure is the submission of the Coordination Request materials and a simplified Form 312 to the Commission, which will establish a place in the first-come, first-served application processing queue conditioned upon the applicant posting a \$500,000 bond within 30 days. As a second step, the prospective licensee must file a complete license application within two years of submission of the Coordination Request materials or forfeit the value of the bond and lose the queue status gained by the prior Coordination Request filing. We adopt a similar two-step application process for GSO FSS operation in frequency bands subject to Appendix 30B of the ITU Radio Regulations based on the different ITU filing requirements for such operation.

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<sup>3</sup> *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Report and Order, 28 FCC Rcd 12403 (2013) (*2013 Report and Order*).

<sup>4</sup> *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Further Notice of Proposed Rulemaking, 29 FCC Rcd 12116 (2014) (*Further Notice*).

<sup>5</sup> See *Report on FCC Process Reform*, GN Docket No. 14-25 (Staff Working Group, Feb. 14, 2014) (*Process Reform Report*).

<sup>6</sup> The commenters are listed in Appendix A. Comments were due on January 29, 2015, and reply comments were due on March 2, 2015. EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC submitted joint comments and reply comments. SES Americom, Inc. and New Skies Satellites B.V. also filed a joint set of comments. For simplicity, we refer to these joint commenters as “EchoStar” and “SES,” respectively.

<sup>7</sup> For convenience, we use “API” to mean the ITU package containing the information for advance publication.

## 1. Background

11. As explained in the *Further Notice*, obtaining international recognition in accordance with the ITU Radio Regulations<sup>8</sup> is generally a critical prerequisite for successful satellite network operation.<sup>9</sup> The current procedure for obtaining international recognition of satellite operations in non-planned FSS frequency bands<sup>10</sup> involves three general steps.<sup>11</sup>

12. First, a responsible department of an ITU member state, or “Administration,” must file a general description<sup>12</sup> of the proposed satellite network—the API.<sup>13</sup> Second, the Administration must file a Coordination Request.<sup>14</sup> Filing the Coordination Request incurs an ITU cost-recovery fee.<sup>15</sup> A Coordination Request is “receivable” between six months and two years after the receipt of the associated API but may be submitted to the ITU simultaneously with an API.<sup>16</sup> The date of receipt of the Coordination Request establishes the protection date of a frequency assignment of a satellite network, which is considered the basis of international coordination. A proposed satellite network must be coordinated with any co-frequency satellite network with an earlier ITU protection date that is deemed to

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<sup>8</sup> The ITU, based in Geneva, Switzerland, is the United Nations specialized agency for information and communication technologies. The Radiocommunication Sector (ITU-R)—one of three Sectors of the ITU—coordinates the international management of the radiofrequency spectrum and satellite orbits. The ITU Radio Regulations have the force of treaty among ITU member states. Electronic versions are available, free of charge, at <http://www.itu.int/pub/R-REG-RR-2012>.

<sup>9</sup> *Further Notice*, 29 FCC Rcd at 12119, ¶ 6.

<sup>10</sup> That is, allocated FSS bands other than the 4500-4800 MHz, 6725-7025 MHz, 10.70-10.95 GHz, 11.20-11.45 GHz, and 12.75-13.25 GHz, which are known as “planned” FSS bands. FSS in these “planned” bands is subject to a Plan in Appendix 30B of the ITU Radio Regulations that specifies the necessary characteristics of FSS stations and the procedures under which these characteristics can be modified and frequency assignments brought into use. These procedures differ from those that apply to operations in non-planned FSS bands.

<sup>11</sup> As noted in Section IV.A.3., below, the recent 2015 World Radiocommunication Conference (WRC-15) decided to eliminate the API requirement for frequency assignments to satellite systems subject to Article 9, Section II of the ITU Radio Regulations. The revised regulations will come into force on January 1, 2017.

<sup>12</sup> See ITU Radio Regulations, No. 9.1, Appendix 4, Annex 2.

<sup>13</sup> See ITU Radio Regulations, Article 9, Section I. The API may be amended after filing, but the use of an additional frequency band or modification of the orbital location by more than  $\pm 6^\circ$  for a GSO space station requires a new API for the modified operations. *Id.*, No. 9.2. The ITU Radiocommunication Bureau will publish the API within three months of receipt. *Id.*, No. 9.2B. APIs are generally not subject to an ITU cost-recovery fee. The exceptions are filings for NGSO systems not subject to coordination, and filings for inter-satellite links of GSO space stations communicating with an NGSO space station not subject to coordination. See ITU Council Decision 482, as amended, Annex (schedule of processing charges), available at <http://www.itu.int/ITU-R/go/space-cost-recovery>.

<sup>14</sup> ITU Radio Regulations, No. 9.30 and Appendix 4, Annex 2. The Radiocommunication Bureau will initially publish the Coordination Request “as received” in the ITU Space Network List webpage within 30 days. See ITU-R Resolution 55 (Rev. WRC-12); Information “As Received” – Coordination Requests, available at <http://www.itu.int/en/ITU-R/space/snl/Pages/asreceivedCR.aspx>. It will officially publish the request within four months of receipt. ITU Radio Regulations, No. 9.38.

<sup>15</sup> See ITU Council Decision 482. An applicant, licensee, or other entity associated with any ITU satellite filing forwarded by the Commission is unconditionally responsible for paying these fees in a timely fashion directly to the ITU. See *Implementation of ITU Cost Recovery Charges for Satellite Network Filings*, Public Notice, 16 FCC Rcd 18732 (Int’l Bur. 2001).

<sup>16</sup> ITU Radio Regulations, Nos. 9.1, 9.5D. Specifically, a Coordination Request for a satellite network requiring coordination under Article 9, Section II of the ITU Radio Regulations is considered as having been received by the Radiocommunication Bureau not earlier than six months after the date of receipt of the associated API. *Id.*, No. 9.1.



be “affected” by the proposed network.<sup>17</sup> Administrations are expected to coordinate in good faith to accommodate, to the extent possible, networks with later protection dates, but an earlier protection date gives an Administration substantial leverage in coordination discussions.<sup>18</sup> Finally, the frequency assignment must be notified<sup>19</sup> and “brought into use”<sup>20</sup> within seven years of receipt of the API by the ITU.<sup>21</sup> Failure to meet this deadline results in the cancellation of the frequency assignments in the API.<sup>22</sup>

13. Currently, the Commission’s International Bureau submits an API or Coordination Request for GSO space station operation at a specified orbital location only after a license application for the proposed operation has been filed with the Commission and the applicant has certified unconditional acceptance of ITU cost-recovery responsibility.<sup>23</sup> An applicant for a Commission space station license, however, must describe a satellite design with much more detail than is necessary to initiate the international coordination process through an API or Coordination Request. Thus, our current procedures may delay the submission of APIs and Coordination Requests for a proposed U.S. satellite network and thereby disadvantage the U.S. operator under the ITU’s coordination regulations.<sup>24</sup>

## 2. Two-Step Process Proposals

14. In the *Further Notice*, we proposed to adopt a procedure in which submission of API and Coordination Request materials to the Commission for filing with the ITU for GSO space station operation in non-planned FSS bands would be a first step in an optional two-step license application process. The remaining information needed to complete a space station license application would be due two years after submission of the ITU materials to the Commission. We contemplated that such ITU filing requests would be electronically submitted and considered in order of receipt, and would be treated as confidential until the Commission submits the filings to the ITU.<sup>25</sup>

15. We also sought comment on whether submission of a letter request for filing of an API and Coordination Request with a simplified description of the satellite network and a cost-recovery declaration should suffice to establish a position in the Commission’s first-come, first-served space station application processing queue.<sup>26</sup> Under this queuing proposal, we intended to allow a party on

<sup>17</sup> See *id.*, Nos. 9.36 (affected Administrations), 9.36.2 (affected networks).

<sup>18</sup> *Id.*, No. 9.53; see also ITU-R Resolution 2 (Rev. WRC-03) (a country whose space radiocommunication services have ITU priority must “take all practicable measures to facilitate the use of new space systems by other countries”).

<sup>19</sup> See ITU Radio Regulations, Article 11.

<sup>20</sup> To bring a frequency assignment into use, a space station capable of using the frequency assignment must be deployed and maintained at the relevant orbital position for at least 90 consecutive days. *Id.*, No. 11.44B.

<sup>21</sup> *Id.*, No. 11.44.

<sup>22</sup> *Id.*; see also *id.*, No. 11.48. If the frequency assignment is successfully brought into use, and certain additional requirements are met, the ITU will record it in the Master International Frequency Register. This recording affords the filing the right to international recognition and protection from interference. See *id.*, Article 8.

<sup>23</sup> See *Further Notice*, 29 FCC Rcd at 12119-20, ¶ 7; 47 C.F.R. § 25.111(d).

<sup>24</sup> As described in the *Further Notice*, the issue of revising the Commission’s ITU filing procedure was also addressed in the *Process Reform Report*, Recommendation 5.8, and associated comments. See *Further Notice*, 29 FCC Rcd at 12120-21, ¶¶ 8-12.

<sup>25</sup> *Id.*, 29 FCC Rcd at 12121-22, ¶¶ 13-14. We also invited comment as to whether the filing of such requests with the Commission would incur a filing fee. *Id.*, 29 FCC Rcd at 12121-22, ¶ 13.

<sup>26</sup> *Id.*, 29 FCC Rcd at 12122, ¶ 15; see also Section IV.G., below, for a discussion of the first-come, first-served application procedure for approving GSO space stations designed to communicate with earth stations with directional antennas. Under Section 25.111(d), the Commission will submit information to the ITU for advance publication and coordination only after the applicant or licensee has submitted a signed declaration that it unconditionally accepts all consequent ITU cost-recovery responsibility. 47 C.F.R. § 25.111(d).

whose behalf the United States has submitted a preliminary API and Coordination Request to shift the proposed orbital location by up to six degrees in either direction along the geostationary arc, as provided for in the ITU Radio Regulations,<sup>27</sup> by submitting modified ITU materials.<sup>28</sup> In that event, the position in the space station application queue established by the original filing would be nullified, and a position in the queue for the changed orbital location would be established as of the time of the electronic filing of the modified ITU materials with the Commission.

16. Commenters addressing the issue uniformly support an ITU filing process available to a prospective licensee before it submits a complete space station license application to the Commission.<sup>29</sup> Parties further agree that the filing of initial ITU materials should carry with it status in the space station application queue.<sup>30</sup> Comments differ, however, on the details of the queueing process. Several parties assert that the submission of API materials to the Commission should suffice to establish an initial place in the queue.<sup>31</sup> For a prospective licensee to retain this initial queue position, Intelsat and DIRECTV suggest that we require submission of associated Coordination Request materials to the Commission within six months of the API.<sup>32</sup> Intelsat also proposes that, if the Coordination Request modifies the orbital location specified in the API within six degrees in either direction, the queue date reset to the ITU date of receipt of the Coordination Request.<sup>33</sup> DIRECTV proposes instead that, under such circumstances, the applicant retain the initial API queue date.<sup>34</sup> Under either Intelsat's or DIRECTV's proposal, a party submitting Coordination Request materials after the minimum six-month period required for them to be receivable by the ITU would forfeit its initial place in the queue based on the API, and receives a new position based on submission of the Coordination Request.<sup>35</sup>

17. In addition, DIRECTV and Intelsat ask that the Commission forward conflicting ITU filings for the same orbital and spectrum resources,<sup>36</sup> and give later filers a corresponding status in the queue.<sup>37</sup> Conversely, SES argues that such later filers should not enjoy "exclusivity rights" in the queue.<sup>38</sup>

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<sup>27</sup> See ITU Radio Regulations, No. 9.2.

<sup>28</sup> *Further Notice*, 29 FCC Rcd at 12122, ¶ 15.

<sup>29</sup> See SIA Comments at 3; GVF Comments at 3; Boeing Comments at 11-12; DIRECTV Comments at 4-5; EchoStar Comments at 19; Intelsat Comments at 4; Iridium Comments at 6; SES Comments at 12; SpaceX Reply at 4; ViaSat Comments at 12; *see also* Inmarsat Comments at 1 (supporting initial comments of SIA and GVF). SIA and GVF are trade associations representing stakeholders in the satellite communications industry. GVF has over 250 members worldwide. SIA's membership includes most other commenters in this proceeding.

<sup>30</sup> See SIA Comments at 3; GVF Comments at 3; DIRECTV Comments at 4-5; EchoStar Comments at 20; Intelsat Comments at 6-7; Iridium Comments at 6; SES Comments at 12; SpaceX Reply at 6-7.

<sup>31</sup> See DIRECTV Comments at 4; EchoStar Comments at 20; Intelsat Comments at 7-8; SES Comments at 12.

<sup>32</sup> See DIRECTV Comments at 4-5; Intelsat Comments at 8. As noted above, a Coordination Request presently is "receivable" at the ITU, and thus able to secure date priority for international coordination, between six months and two years after the associated API. *See* Section IV.A.1., *supra*.

<sup>33</sup> See Intelsat Comments at 9.

<sup>34</sup> See DIRECTV Comments at 4; DIRECTV Reply at 3. Under DIRECTV's proposal, the submission of an API establishes a place in the application queue for orbital locations across a 12° span of the geostationary arc. DIRECTV argues that without this flexibility in the application queue, U.S. operators would be forced to "tip their hand" at the ITU before they have secured a date of protection by filing a receivable Coordination Request. DIRECTV Reply at 3.

<sup>35</sup> See DIRECTV Comments at 5; Intelsat Comments at 8.

<sup>36</sup> See DIRECTV Comments at 4-5; Intelsat Comments at 5-6, 11-12. Nonetheless, Intelsat asks that a license applicant be permitted to withdraw its application, and receive a refund of any filing fee paid, in the event that the preclusive effect of previously filed ITU materials becomes publicly known only after the license application is filed. Intelsat Comments at 11-12.



18. Commenters also propose varying deadlines to file a complete license application after submission of the initial ITU materials. SES, Iridium, and DIRECTV suggest filing periods of 90 days,<sup>39</sup> 6 months,<sup>40</sup> and 7 months,<sup>41</sup> respectively—shorter than the two-year limit that we proposed.<sup>42</sup> These parties note that a brief application filing window, and concordantly brief period of queue priority established by ITU filings, reduces opportunities for warehousing at this early stage.<sup>43</sup> EchoStar and Intelsat support the proposed two-year application deadline.<sup>44</sup> EchoStar argues that two years is a reasonable period for the satellite operator to analyze the coordination priorities at the ITU.<sup>45</sup> Intelsat notes that the design of a satellite network may change during international coordination, and asserts that a two-year window would avoid forcing a prospective licensee to hastily file, and later amend, its space station application.<sup>46</sup>

### 3. Two-Step Process Adopted

19. We adopt a modified version of the two-step application process proposed in the *Further Notice*. Initially, any party that will seek a GSO space station license from the Commission to provide FSS in non-planned frequency bands may submit API materials to the Commission for forwarding to the ITU before submitting a corresponding license application.<sup>47</sup> This initial submission must include a letter

(Continued from previous page)

<sup>37</sup> See DIRECTV Comments at 4-5; Intelsat Comments at 10.

<sup>38</sup> SES Reply at 11 (stating concerns that later filers under a “next in line” approach would be given “a long-term right of first refusal over spectrum and orbital resources without having to make any material commitment” to system development).

<sup>39</sup> SES Comments at 12; SES Reply at 7-11. SES concedes that a filing window longer than 90 days would provide additional certainty with respect to the international coordination landscape, but argues that benefit does not outweigh the associated warehousing risks. SES Reply at 10-11.

<sup>40</sup> Iridium Comments at 6; Iridium Reply at 7-8. Iridium suggests specifically that parties should be required to file a complete license application within six months of the submission of both API and Coordination Request materials to the ITU. Iridium Comments at 6.

<sup>41</sup> See DIRECTV Comments at 4-5; DIRECTV Reply at 3. Specifically, DIRECTV would require the full license application to be filed within 30 days of the Coordination Request, and the Coordination Request to be filed within six months of the API. DIRECTV Comments at 4-5.

<sup>42</sup> *Further Notice*, 29 FCC Rcd at 12122, ¶ 14.

<sup>43</sup> See, e.g., DIRECTV Comments at 4 (“[T]he mere filing of an API should not enable a party to block the development of a portion of the orbital arc by another U.S. operator for an extended period of time.”); Iridium Reply at 8 (“A six-month filing period would provide ample time for developing a full application and would avoid opportunities for warehousing spectrum that longer filing periods would afford.”); SES Comments at 12 (arguing that with a shorter application deadline, “attempts to engage in warehousing would be deterred by the fact that the period of ‘cost-free’ exclusivity would be brief”).

<sup>44</sup> EchoStar Comments at 19-21; EchoStar Reply at 5; Intelsat Comments at 9-10; Intelsat Reply at 3-5.

<sup>45</sup> See EchoStar Comments at 19-20. To deter warehousing during this period, EchoStar suggests that the Commission require an entity filing through the United States at this early stage to provide a report after the first year on its development process. EchoStar Comments at 23.

<sup>46</sup> See Intelsat Reply at 4. In the event that a corresponding license application is not timely submitted, Intelsat recommends that the Commission allow other U.S. operators to use the associated ITU filings, subject to acceptance of future ITU cost-recovery fees. Intelsat Comments at 10 n.26.

<sup>47</sup> We explain the advance ITU filing process for GSO operation in planned FSS bands, which is not subject to the same API and Coordination Request requirements, in Section IV.A.8., below. We also explain in that Section our treatment of ITU filings for non-geostationary satellite systems and GSO satellite networks that will provide service other than FSS.

request for filing of the API and a signed cost-recovery declaration.<sup>48</sup> The Commission will process and forward up to five APIs from an entity if not accompanied by a Coordination Request and will not assess mutual exclusivity issues.<sup>49</sup>

20. The filing of API materials with the Commission will not establish priority in the Commission's first-come, first-served queue. We note that some commenters advocate that queue status accompany the initial API.<sup>50</sup> We prefer instead to establish queue status upon filing of Coordination Request materials, as described below, for several reasons. First, our approach better aligns with the ITU system. Filing an API at the ITU neither incurs a cost-recovery obligation nor establishes a protection date of the frequency assignments of the proposed satellite network.<sup>51</sup> Similarly, we will not require a fee in connection with the API filing request or give the request queue status.<sup>52</sup> The recent WRC-15, moreover, decided to eliminate the requirement for API submissions for the frequency assignments of satellite systems subject to Article 9, Section II of the ITU Radio Regulations. These systems include the GSO FSS systems available for licensing under the two-step application process. While the revised ITU regulations will not become effective until January 1, 2017, our adopted application process is compatible with both the current and revised ITU coordination procedures. Under transitional measures, the ITU will cease applying the API requirement to systems subject to Article 9, Section II on July 1, 2016.<sup>53</sup> Accordingly, the Commission will no longer forward API filings for such systems after that date, and instead will initiate the coordination process at the ITU with the filing of the Coordination Request. Second, setting queue priority upon submission of Coordination Request materials to the Commission, which may be filed simultaneously with an API, simplifies the queueing process.<sup>54</sup> Finally, a prospective licensee wishing to secure a spot in the application processing queue upon first disclosing its planned satellite network may do so by submitting API and Coordination Request materials at the same time.

21. In order to establish and perfect a queue position under the new, optional, two-step application process, an applicant must submit a draft Coordination Request filing to the Commission, using simplified Form 312 (Main Form),<sup>55</sup> pay the license application fee, and post a \$500,000 bond.<sup>56</sup>

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<sup>48</sup> Section 25.111(d), as revised, will govern the cost-recovery declaration. See Appendix B, *infra* (Section 25.111(d)).

<sup>49</sup> See Appendix B, *infra* (Section 25.111(e)).

<sup>50</sup> See DIRECTV Comments at 4; EchoStar Comments at 20; Intelsat Comments at 7-8; SES Comments at 12. *But see* Iridium Comments at 6 (proposing six-month application deadline after submission of both API and Coordination Request filings to avoid warehousing opportunities).

<sup>51</sup> See Section IV.A.1., *supra*. For exceptions when an API does incur an ITU cost-recovery fee, see note 13, above.

<sup>52</sup> We do not view such filings to fall under any of the categories in the schedule of charges for applications and other filings for the international services, 47 C.F.R. § 1.1107.

<sup>53</sup> WRC-15 Provisional Final Acts, Resolution COM5/3 (WRC-15), available at <http://www.itu.int/pub/R-ACT-WRC.11-2015/en>.

<sup>54</sup> For example, the queueing proposals of DIRECTV and Intelsat require a party submitting API materials to follow up with a Coordination Request filing within six months or potentially lose its position in the queue. DIRECTV Comments at 4-5; Intelsat Comments at 8. This added requirement is unnecessary under our approach, and would poorly fit the ITU's own procedures given its decision to eliminate the API requirement for many satellite networks.

<sup>55</sup> See Appendix B, *infra* (Section 25.110(b)(3)(i)). The Form 312, when submitted, provides the time of submission to the millisecond. This level of specificity is used to avoid comparative treatment of mutually exclusive "GSO-like" applications under our rules, and might not be provided by the simple filing of a letter request. See 47 C.F.R. § 25.155(c)(2). The "simplified" Form 312, Main Form submission must include the information required by items 1-17, 43, 45, and 46, but may omit other requested information.

<sup>56</sup> See Appendix B, *infra* (Section 25.165(f)). Applicants filing at this stage will be entitled to a refund of the application fee to the same extent that applicants are entitled to a refund under 47 C.F.R. § 1.1115(d). Thus, an applicant that has submitted Coordination Request materials and an initial Form 312 to the Commission will be

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This first-step application submission will establish a place in the space station application processing queue as of the time of filing of the simplified Form 312 with the Commission.<sup>57</sup> A party submitting an API filing request to the Commission may file associated Coordination Request materials at the same time or at any time within two years of API submission to the ITU. As with APIs, the International Bureau will forward potentially conflicting Coordination Requests to the ITU and issue a public notice announcing that submission.<sup>58</sup> If an applicant later modifies the submitted Coordination Request materials to change the proposed orbital location or to add frequencies, we will reset the queue position for the new or modified operations to the date of receipt of the modified Coordination Request materials by the Commission.<sup>59</sup>

22. As we observed in the *Further Notice*,<sup>60</sup> the information provided in a Coordination Request is not sufficiently detailed to enable the Commission to determine mutual exclusivity with other space station applications. The queue position of a Coordination Request is, therefore, provisional until the application has been completed. For bands in which we apply two-degree spacing requirements,<sup>61</sup> we will presume that a full application is mutually exclusive with a Coordination Request for co-frequency space station operation within two degrees of orbital separation. Final determination on mutual exclusivity will be done after the full application associated with the Coordination Request is received by the Commission.

23. The final step is to submit a complete space station license application for operation using the orbital location, frequency bands, and polarization proposed in the Coordination Request, including the information required by Sections 25.114 and 25.140,<sup>62</sup> and the full application fee, within two years of

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entitled to a refund if the applicant notifies the Commission that it no longer wishes to keep its application on file before the Commission has issued a public notice announcing that the Coordination Request materials have been submitted to the ITU. Because we will require the full license application fee at this stage, we reduce the amount of the application-stage bond, as explained below. A copy of the required bond must be filed with the Commission within 30 days after release of the public notice announcing that the Commission has filed the Coordination Request with the ITU. We elaborate on the application-stage bond requirement in Section IV.A.4., below.

<sup>57</sup> See Appendix B, *infra* (Section 25.158(b)). We will establish the initial queue date based on the time that the International Bureau receives the Form 312 and Coordination Request materials, rather than by the ITU date of receipt of the materials, which will simplify the process, provide applicants greater certainty when they file, and reduce administrative burdens on the Commission.

<sup>58</sup> See Appendix B, *infra* (Sections 25.151(a)(9) and 25.158(b)(2)(i)). We believe that the bond requirement and ITU cost-recovery obligation should satisfy SES's concern that later filers may be given "a long-term right of first refusal over spectrum and orbital resources without having to make any material commitment." SES Reply at 11. To the extent they do not, we disagree with SES that concerns about speculation at the Coordination Request stage warrant a departure from the usual queue status afforded to later-in-line filers. See generally *Space Station Licensing Reform Order*, 18 FCC Rcd at 10792, ¶ 71 (noting that under the application processing queue, if the lead application cannot be granted, the Commission will consider the next application in the queue, and continue this process until it can grant an application).

<sup>59</sup> We include in this category any modification to the proposed satellite network for which the ITU would require an amended API and would reset the receivable date of the associated Coordination Request, thus delaying the earliest possible date of priority for international coordination.

<sup>60</sup> *Further Notice*, 29 FCC Rcd at 12122, ¶ 14.

<sup>61</sup> As noted below, we will apply two-degree spacing criteria to operation in the conventional and extended C-band, conventional and extended Ku-band, and conventional Ka-band. We also apply two-degree spacing criteria, by default, to operation in FSS bands in which we have not adopted service rules. See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10808, ¶ 119.

<sup>62</sup> See Appendix B, *infra* (Section 25.110(b)(3)(iii)); 47 C.F.R. §§ 25.114, 25.140. We note that a party taking full advantage of the two-year application period will confront the seven-year ITU "bringing into use" deadline before the five-year milestone in its license to launch and begin operations, given the additional time necessary to process

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the filing of the initial Coordination Request materials with the Commission. A two-year period will allow prospective licensees to initiate coordination at the earliest stages of the system design process, assess the international coordination landscape, and adjust their proposed satellite networks, before fully embarking on the licensing process. In contrast, requiring prospective U.S. licensees to submit their complete applications within a shorter period of time after submission of the ITU materials could (1) delay submission of filings to the ITU until the operator has developed more detailed plans for the design of its satellite network; or (2) prompt applicants to submit a complete application based on a less mature satellite design, which will require later amendment and/or modification as plans evolve and thereby unnecessarily consume resources of both the applicant and the Commission. In light of these benefits, the warehousing concerns that underlie the suggested shorter filing periods are appropriately addressed by the application-stage bond discussed below. If a party conveys to the Commission that it no longer wishes to use an API or Coordination Request submitted to the ITU at its request, or if an applicant fails to submit the information required by the second step of the licensing process within the two-year period, any queue status based on the Coordination Request filing will be nullified. In that case, we will issue a public notice announcing any nullification of an applicant's position in the queue and the availability of the API and/or Coordination Request filings and will allow the first party to submit a letter request and cost-recovery declaration to use them.<sup>63</sup>

24. This optional, two-step application process will serve the public interest by allowing prospective licensees to submit API and Coordination Request filings to the ITU through the United States, and thereby establish an ITU date of protection for the frequency assignments of the proposed satellite network, at an earlier stage in the system design process than is generally possible under our current rules. Earlier submission of ITU filings, in turn, will secure a stronger position in ITU coordination discussions for operators making use of those U.S. ITU filings. The two-step process accomplishes this goal by permitting space station operators to submit filings to the ITU at the earliest stages of satellite network design, and well in advance of the requirement to file a detailed space station application with the Commission. In addition, it removes a competitive disadvantage for prospective Commission licensees compared to licensees in other countries, who are typically able to request submission of ITU filings without providing the detailed technical information required in a Commission space station license application.<sup>64</sup>

#### 4. Application-Stage Bond

25. *Background.* To reduce the risk of warehousing associated with our queueing proposal in the *Further Notice*,<sup>65</sup> we proposed a surety bond requirement at the initial ITU filing stage.<sup>66</sup> This

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the application. In that case, as today, the licensee would be required to launch its satellite within the ITU date to maintain its ITU date precedence. If the licensee loses its ITU date precedence, it would be free to submit a new ITU filing. *See Space Station Licensing Reform Order*, 18 FCC Rcd at 10875, ¶ 312.

<sup>63</sup> An applicant accepting such abandoned ITU filings will be required to accept any attendant ITU cost-recovery obligations that have not yet been incurred in connection with the filings. In addition, the queue priority date for the applicant accepting the filings will be established as of the time of its request for use of the filings, if it submits an application-stage bond within the 30-day period, or as of the time it submits a complete space station application. Queue priority will not relate back to any queue priority previously established by the filing of the Coordination Request materials. We will follow this same procedure if an applicant submitting Coordination Request materials to the Commission fails to file a copy of the required bond with the Commission within 30 days after release of the public notice announcing that the Commission has filed the Coordination Request with the ITU.

<sup>64</sup> *See, e.g.,* Intelsat Comments at 3-4 (noting that “by the time a U.S. operator possesses the information required for a U.S. space station license application, another Administration could file an API on behalf of a foreign operator, thereby allowing the foreign operator to claim ITU coordination priority over the U.S. operator”).

<sup>65</sup> “Warehousing,” as we use the term here, refers to retention of preemptive rights to use spectrum and orbital resources by an entity that does not intend to bear the cost and risk of constructing, launching, and operating an

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application-stage bond requirement would be in addition to the post-licensing bond requirement in Section 25.165.<sup>67</sup> The bond would be payable if a party who has secured a spot in the first-come, first-served queue defaults by failing to complete an acceptable license application on schedule or if its license application is denied.<sup>68</sup> We invited comment on whether a surety bond created in connection with a request for an ITU filing should be released when the party in interest files a post-grant surety bond pursuant to Section 25.165, or whether the application-stage bond should be maintained pending satisfaction of all milestone requirements.<sup>69</sup> For parties wishing to avoid posting an application-stage filing bond, we invited comment on affording the option to request API and Coordination Request filings without establishing a spot in the first-come, first-served queue until a license application is filed.<sup>70</sup>

26. *Discussion.* Commenters generally oppose the proposed application-stage bond requirement and recommend a number of alternatives. DIRECTV and SES prefer establishing shorter deadlines to file a complete license application, along with other safeguards,<sup>71</sup> as alternative means to address warehousing at the ITU filing stage.<sup>72</sup> Though favoring a two-year application window, Intelsat argues that its proposal to require a Coordination Request filing, which carries an ITU cost-recovery obligation of around \$36,000, within six months of an API obviates the need for an application-stage bond.<sup>73</sup> EchoStar argues that a requirement to post a surety bond at the ITU filing stage would deter filings through the United States Administration, as other Administrations do not impose a bond at this stage.<sup>74</sup>

27. EchoStar also disputes the Commission's legal authority to impose this type of bond.<sup>75</sup> Opposing the view expressed in the *Further Notice*,<sup>76</sup> EchoStar argues that Sections 4(i) and 308(b) of the

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authorized space station or is not fully committed to doing so. The Commission has adopted safeguards to discourage warehousing. *See, e.g.*, Section IV.C.1., *infra* (discussing milestone policies).

<sup>66</sup> *Further Notice*, 29 FCC Rcd at 12122-23, ¶ 16.

<sup>67</sup> *Id.*; *see also* 47 C.F.R. § 25.165.

<sup>68</sup> *Further Notice*, 29 FCC Rcd at 12122-23, ¶ 16. We proposed an application-stage bond value of two-fifths of the value of a post-licensing bond, reasoning that an application-stage bond could secure two years of exclusivity before a complete application is filed, while a post-licensing bond for a GSO space station authorization can potentially secure five years of exclusivity before launch and operation. *Id.*, 29 FCC Rcd at 12129-30, ¶ 33.

<sup>69</sup> *Id.*, 29 FCC Rcd at 12122-23, ¶ 16.

<sup>70</sup> *Id.*, 29 FCC Rcd at 12123, ¶ 17.

<sup>71</sup> For example, DIRECTV's queuing proposal includes a requirement to file a Coordination Request within six months of the API. *See* DIRECTV Comments at 4-5.

<sup>72</sup> *See* DIRECTV Comments at 5 ("The process [of requiring a Coordination Request within six months of an API, and a license application 30 days thereafter] eliminates the need for requiring any party to post a bond in connection with an API or [Coordination Request.]"); SES Comments at 12 ("[I]f the Commission keeps the time limit for filing a full FCC application relatively brief, that would eliminate the need to impose an ITU-related surety bond."). If the Commission were to adopt a two-year application timeframe, however, SES concludes that imposing a surety bond would be required to prevent warehousing. SES Comments at 12; SES Reply at 11.

<sup>73</sup> *See* Intelsat Comments at 12-13. Under Intelsat's proposal the initial API filing establishes a place in the application queue.

<sup>74</sup> *See* EchoStar Comments at 21, 23.

<sup>75</sup> *See id.* at 21-23.

<sup>76</sup> *See Further Notice*, 29 FCC Rcd at 12122 n.20 ("We believe that adoption of such a bond requirement for those filing such preliminary requests [for submission of ITU materials], which would effectively constitute the initial step in an optional two-step licensing process, is within the Commission's statutory authority under Sections 4(i) and 308(b) of the Communications Act of 1934, 47 USC §§ 154(i) and 308(b), for essentially the same reasons that the

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Communications Act do not provide the Commission with an adequate legal basis for conditioning a request that the Commission forward materials to the ITU on the filing of a bond.<sup>77</sup> First, EchoStar contends that the Commission's authority under Section 308(b)<sup>78</sup> is unavailing because a request to forward ITU materials, "by itself, is not an application for a station license."<sup>79</sup> Second, assuming that such filings would constitute the first step in an optional, two-step application process, EchoStar maintains that a pending application does not afford the applicant any "vested right vis-à-vis the Commission or the United States government" to which the Commission may attach a bond.<sup>80</sup> Regarding our authority under Section 4(i) and Section 308(b),<sup>81</sup> EchoStar argues that the Commission may not rely on its previous rationale supporting a post-licensing bond, because "[a]t the ITU filing stage, the entity requesting the filing is not a Commission licensee."<sup>82</sup>

28. We disagree with EchoStar's assertion that the Commission does not have statutory authority to impose the type of application-stage bond requirement that we are adopting here. As explained above, the bond is part of the initial set of materials – which also includes the simplified FCC Form 312, Main Form, the application fee, and the Coordination Request – that, when submitted, will secure the prospective licensee priority in the Commission's application processing queue. As such, the submission of these materials constitutes the first step of a two-step procedure for filing a satellite license application. As described in greater detail below, we have decided to require an application-stage bond in order to help ensure that the applicant has the financial wherewithal and commitment to build and operate the satellite and associated service, and that the applicant is not using the application process as a way to speculate or warehouse spectrum without the capability or *bona fide* intention to secure the requested license and carry the endeavor through to the provision of service. This type of requirement derives from Section 308(b) of the Communications Act, which authorizes the Commission to require that a license applicant provide, as part of its application, assurances of its qualifications to operate the licensed station. One such assurance is the bond, which the Commission has used pursuant to Section 308(b) for satellite licensees since 2003.<sup>83</sup>

29. EchoStar's assertion that the Commission may not impose a bond requirement on Coordination Request filings because "an ITU filing, by itself, is not an application,"<sup>84</sup> is incorrect in light

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Commission concluded that adopting the post-grant bond requirement in 47 C.F.R. § 25.165 was within its authority.").

<sup>77</sup> EchoStar also argues that the Commission lacks authority to prescribe an application-stage bond under Sections 303(l)(i) and 303(r) of the Communications Act, 47 U.S.C. §§ 303(l)(i), 303(r). The Commission has cited these statutory provisions as authority for the existing post-licensing bond, but we do not rely on Section 303(l)(i) as authority here for the application-stage bond. See *Amendment of the Commission's Space Station Licensing Rules and Policies*, IB Docket No. 02-34, First Order on Reconsideration and Fifth Report and Order, 19 FCC Rcd 12637, 12643-45, ¶¶ 14-15 (2004) (*Bond Order*). As we explain below, Section 303(r) does, in fact, provide support for our actions here. See ¶ 30, *infra*.

<sup>78</sup> 47 U.S.C. § 308(b) ("All applications for station licenses, or modifications or renewals thereof, shall set forth such facts as the Commission by regulation may prescribe as to the citizenship, character, and financial, technical, and other qualifications of the applicant to operate the station[.]").

<sup>79</sup> See EchoStar Comments at 21.

<sup>80</sup> See *id.* at 21-22, n.52.

<sup>81</sup> 47 U.S.C. § 154(i) ("The Commission may perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions.").

<sup>82</sup> See EchoStar Comments at 21.

<sup>83</sup> See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10825, ¶ 167; *Bond Order*, 19 FCC Rcd at 12642, ¶ 12.

<sup>84</sup> See EchoStar Comments at 21-22.



of the application regime we are adopting. The submission of the Coordination Request to the Commission is part of an application process that begins with the filing of the simplified FCC Form 312, Main Form, along with a statutorily required license application fee and the Coordination Request. The requirement that a bond be obtained at that time enables the applicant to provide factual evidence at this first step of the application process that it is committed to follow through with its proposed satellite system and to be a Commission licensee. Nor do we agree that the Commission's ability to impose a bond at this stage of the application process requires that the applicant obtain any greater rights at this first step than we have provided.<sup>85</sup> With the filing of the application at the first step of the process, the applicant is entitled to consideration of its request for a license under rules that establish a path toward licensing. That is all that is required under Section 308(b) in order for the Commission to prescribe requirements on applicants to ensure their financial commitment and qualifications, like the application-stage bond. To the extent EchoStar is contending that the applicant must hold some sort of greater "vested right vis-à-vis the Commission or the United States government" in order for the Commission to require a demonstration of its financial wherewithal and intent to proceed by the securing of a bond, it cites no authority and we are aware of none.<sup>86</sup> And in fact, at this stage of the two-step application process, the applicant receives a significant right in addition to the right to have its license application considered: it receives priority in the Commission's application processing queue. We also observe that the Commission has previously adopted a surety bond requirement at the application stage,<sup>87</sup> before the applicant has been granted any operating authority.

30. Although Section 308(b) does not enumerate specific ways that the Commission may determine what will be effective in ensuring a prospective licensee's commitment and ability to use licensed spectrum, the Commission has the authority under Sections 4(i) and 303(r) of the Communications Act to take the actions necessary to carry out its functions and ensure that provisions such as Section 308(b) are given effect.<sup>88</sup> Similar to the post-licensing bond requirement, an application-stage bond requirement is necessary to ensure that applicants are qualified at an early stage of the licensing process and committed to and able to proceed with the project, when by their filing they may preclude the use of spectrum and orbital resources by other entities that are financially willing and able to proceed.<sup>89</sup> The adoption of a bond requirement thus enables the Commission to fulfill its obligations

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<sup>85</sup> *Id.* at 21-22, n.52.

<sup>86</sup> EchoStar Comments at 21-22, n.52. EchoStar merely notes the limits of such rights afforded to Commission applicants.

<sup>87</sup> *See Amendment of Part 22 of the Commission's Rules Relating to License Renewals in the Domestic Public Cellular Radio Telecommunications Service*, CC Docket No. 90-358, Report and Order, 7 FCC Rcd 719, 723-24, ¶¶ 22-25 (1991).

<sup>88</sup> 47 U.S.C. § 154(i) (authorizing the Commission to "perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions"); 47 U.S.C. § 303(r) (directing the Commission to "[m]ake such rules and regulations and prescribe such restrictions and conditions, not inconsistent with law, as may be necessary to carry out the provisions of this chapter"); *see also* 47 U.S.C. § 303(f) (requiring Commission to "[m]ake such regulations not inconsistent with law as it may deem necessary . . . to carry out the provisions of this chapter").

<sup>89</sup> *See Bond Order*, 19 FCC Rcd at 12642, ¶ 14. The application-stage bond requirement deters speculative applications that carry preemptive rights in the queue under this optional procedure, and is necessary in order to fulfill our role in establishing requirements of applicants under Section 308(b) of the Act. *See* 47 U.S.C. § 308(b). Therefore, we do not agree with EchoStar's apparent implication that the Commission's authority under Section 4(i) is limited to imposing requirements on entities that are already licensees. EchoStar Comments at 22; *see also* 47 U.S.C. § 308(b) ("All applications for station licenses . . . shall set forth such facts as the Commission by regulation may prescribe as to the . . . financial . . . qualifications of the applicant to operate the station . . ."). Indeed, neither Section 4(i) nor 303(r) contain any indication that they are limited in this regard. Because we do not rely on Section 303(l)(i) of the Act as authority for the application-stage bond, we need not address EchoStar's further arguments as to that Section. *See* EchoStar Comments at 21-22.

under Section 308(b) of the Communications Act, by ensuring that that provision is given meaningful effect.

31. With this statutory authority, we adopt an application-stage bond requirement as a simple mechanism to deter applicants from warehousing spectrum and orbital resources at the ITU filing stage.<sup>90</sup> Warehousing could occur at this stage because the filing of Coordination Request materials establishes a place in the first-come, first-served processing queue. This queue position may be held for up to two years before the applicant files a complete license application. During this two-year period, under the processing queue, we will defer action on any complete application filed by another party if the application is considered mutually exclusive with earlier-filed Coordination Request materials. Thus, a first-step applicant can effectively “tie up” resources for a two-year period, and we believe that an application-stage bond is the best means to address this warehousing concern given the benefits of the two-year application period.

32. The bond obviates the need for several, more complicated safeguards and procedures suggested by commenters.<sup>91</sup> Instead, a party that defaults on its obligation to timely file an acceptable application for the operation proposed in a Coordination Request, or Appendix 30B filing as noted below,<sup>92</sup> must forfeit the value of the application-stage bond. This simple financial incentive should deter speculation during the two-year period of queue priority before the applicant must submit a complete application. The two-year application period, in turn, will afford applicants greater flexibility to submit Coordination Request filings early in the satellite network design process, and thereby secure an earlier protection date for the frequency assignments in the U.S. ITU filing. For the same reasons that we have declined to allow escrow accounts or letters of credit to satisfy the post-licensing bond requirement, we will not allow them to satisfy the application-bond requirement.<sup>93</sup> Specifically, we believe that alternatives such as an escrow account or letter of credit are not as effective as the market-based mechanism incorporated in the bond and may not ensure payment in the event of bankruptcy. Based on comments we received from the surety industry, we will release the application-stage bond upon finding that a timely filed application is acceptable for filing, rather than maintaining the bond until the application is ultimately granted.<sup>94</sup> This will ensure that the applicant has greater control over the event causing default under the bond, which should make the bond easier to underwrite.

33. We will set the application-stage bond amount at \$500,000.<sup>95</sup> In the *Further Notice*, we proposed to calculate this value as two fifths of the value of a post-licensing bond for a GSO space station license, given that an application-stage bond could secure exclusivity in the queue of up to two years, and the post-licensing bond could secure exclusivity for up to five years.<sup>96</sup> Because we decide, below, to maintain the maximum potential liability under the post-licensing bond at its current \$3 million value, the application-stage bond so calculated would be \$1.2 million. The preclusive effect of a first-step application filing, however, is less severe than that of a granted license because parties may file applications behind an earlier applicant in the queue that they suspect of speculating. Once a license has been granted, we dismiss any later-filed, mutually exclusive applications in the queue.<sup>97</sup> In addition, a

<sup>90</sup> See Appendix B, *infra* (Section 25.165(f)).

<sup>91</sup> See Section IV.A.5., *infra*.

<sup>92</sup> See Section IV.A.8., *infra*.

<sup>93</sup> See *Bond Order*, 19 FCC Rcd at 12666, ¶ 79; see also Section IV.D.4., *infra*.

<sup>94</sup> See Surety Association Comments.

<sup>95</sup> Unlike the modified post-licensing bond requirement we adopt below, potential liability under the application-stage bond will not increase over time. We prefer a fixed bond amount at the ITU filing stage to simplify this requirement, given the shorter period of exclusivity secured by the bond and its lower value.

<sup>96</sup> See note 68, *supra*.

<sup>97</sup> See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10806, ¶ 113.

relatively high application-stage bond amount could dissuade prospective satellite operators from submitting ITU materials through the United States and licensing their space stations with the Commission.<sup>98</sup> Thus, to not unduly deter such applications, and given that the current \$130,000 application fee will be due upon submission of Coordination Request information, we will roughly halve the amount calculated by the proposal in the *Further Notice*, to a value of \$500,000. Finally, we disagree with Intelsat that the obligation to pay a \$36,000 ITU cost-recovery fee in connection with the Coordination Request filing is a sufficient indicator that the applicant will not warehouse spectrum in the Commission's licensing process at this stage. We consider that \$36,000 fee insufficient as evidence of the applicant's commitment to proceed in the application process to the next stage and beyond.

34. We will require the \$500,000 bond to be posted within 30 days of the release of the public notice announcing that the Coordination Request has been submitted to the ITU.<sup>99</sup> If an applicant fails to timely post the application-stage bond, we will issue a public notice announcing the nullification of that applicant's position in the queue and the availability of the API and Coordination Request filings and will allow the first subsequent party to submit a letter request and cost-recovery declaration to use them.<sup>100</sup> Finally, we will establish an appropriate queue position for all complete requests for submission of Coordination Request materials, and therefore require an application-stage bond for all such requests.<sup>101</sup> Given the importance of establishing queue priority for a prospective U.S. licensee, we do not expect that many would wish to forgo obtaining queue status by electing an option not to post the application-stage bond. Moreover, we do not wish the United States to file superfluous Coordination Requests with the ITU.

#### 5. Other Mechanisms to Deter Warehousing

35. *Background.* As an additional means to deter warehousing, we invited comment on whether failure to meet the proposed two-year application-filing deadline should count as a missed milestone for purposes of the "Three-Strikes" rule in Section 25.159(d).<sup>102</sup> The rule provides that a licensee that misses three or more milestone requirements within any three-year period may not apply for another space station license if it has more than one space station application already pending or more than one outstanding license for an unbuilt satellite system, unless the licensee rebuts a presumption that it filed applications for speculative purposes or demonstrates that it would be "very likely" to construct the licensed facilities if allowed to file more applications.

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<sup>98</sup> We believe that Commission licensing of space stations, which may serve geographic areas anywhere in the world, carries varied public interest benefits, including: ensuring that appropriate orbital debris mitigation measures are taken with respect to such satellites, thereby preserving the orbital environment for future use; supporting provision of service to U.S. citizens globally; and strengthening the voice of the United States in international frequency use decision-making. We disagree with EchoStar, however, that the possibility of deterring some ITU filings through the United States warrants abandoning the application-stage bond requirement altogether. The bond is necessary to deter financially unqualified parties from warehousing in the queue during the two-year application period, and we believe that \$500,000 strikes an appropriate balance between these competing interests.

<sup>99</sup> See Appendix B, *infra* (Section 25.165(f)). In the event an application requests that the Commission delay submission of the Coordination Request we will require the bond to be posted within 30 days of release of the public notice announcing the filing of the Coordination Request materials with the Commission.

<sup>100</sup> An applicant accepting such abandoned ITU filings will be required to accept any attendant ITU cost-recovery obligations that have not yet been incurred in connection with the filings. In addition, the queue priority date for the applicant accepting the filings will be established as of the time of its request for use of the filings, if it submits an application-stage bond within the 30-day period, or as of the time it submits a complete space station application. Queue priority will not relate back to any queue priority previously established by the filing of the Coordination Request materials. See ¶ 23, *supra*.

<sup>101</sup> See *Further Notice*, 29 FCC Rcd at 12123, ¶ 17.

<sup>102</sup> *Id.*, 29 FCC Rcd at 12123, ¶ 18; 47 C.F.R. § 25.159(d).

36. *Discussion.* SES supports applying the “Three-Strikes” rule to parties that repeatedly request ITU submissions without filing a complete application.<sup>103</sup> In contrast, DIRECTV, EchoStar, and Intelsat argue that imposing the rule at the API stage would unduly punish parties that, after exploring the potential for coordination and ITU priority, ultimately choose not to pursue a space station authorization.<sup>104</sup> DIRECTV and EchoStar agree with SES, however, that the Commission should establish a fixed limit on the number of API filing requests by any party as a means to deter speculation.<sup>105</sup> For example, DIRECTV specifies that the submission of an API should count for purposes of the current limits in Section 25.159(a).<sup>106</sup> Section 25.159(a) imposes a limit of five on the number of pending GSO-like applications and licensed-but-unbuilt GSO-like space stations that an entity may have in a particular frequency band.<sup>107</sup> EchoStar also proposes a limit of five pending APIs in each band.<sup>108</sup> However, Intelsat argues that including APIs in the limit in 25.159(a) would unduly restrict the ability of applicants to request filings with the ITU.<sup>109</sup>

37. In light of our adoption of an application-stage bond requirement, we will not apply the “Three-Strikes” rule to instances in which a complete application is not timely filed after an initial Coordination Request. We also will not include Coordination Request filings in the five-item limit on pending applications and unbuilt authorizations in a particular frequency band, which we eliminate below.<sup>110</sup> Instead, we believe that the possibility of surrendering the \$500,000 bond will appropriately deter speculative submissions of Coordination Request materials for the reasons discussed above. We will, however, limit to five the total number of API filings that a party may request to be submitted through the United States without also timely submitting associated Coordination Request materials and a bond.<sup>111</sup> Although no queue status will attach to the API filing requests, we nonetheless do not wish to engage the United States in submitting large numbers of APIs to the ITU bearing no relationship to realistic satellite deployment plans. Because parties may request additional API submissions that are accompanied by Coordination Request materials, we believe this limit will restrain superfluous filings without unduly restricting the flexibility of prospective licensees.<sup>112</sup>

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<sup>103</sup> See SES Comments at 13; SES Reply at 11-12.

<sup>104</sup> See DIRECTV Reply at 2-3; EchoStar Comments at 23-24; EchoStar Reply at 4; Intelsat Comments at 10-11. EchoStar requests we abandon the rule altogether. See EchoStar Comments at 23-24.

<sup>105</sup> See DIRECTV Comments at 4; DIRECTV Reply at 2-3; EchoStar Reply at 3-4; SES Comments at 13; SES Reply at 11-12. These parties assume that an API filing request would establish a place in the space station application processing queue.

<sup>106</sup> DIRECTV Reply at 2-3.

<sup>107</sup> 47 C.F.R. § 25.159(a).

<sup>108</sup> EchoStar Reply at 4.

<sup>109</sup> See Intelsat Reply at 5 n.10.

<sup>110</sup> See Section IV.Z., *infra.*; 47 C.F.R. § 25.159(a). Nonetheless, an applicant that has triggered the presumption of the Three-Strikes rule due to repeatedly failing to meet its milestone obligations will be subject to the lowered limit on space station license applications, including first-step filings.

<sup>111</sup> Unlike current Section 25.159(a), we will not apply this five-item limit on APIs alone on a per-frequency-band basis. Given that additional APIs will be forwarded if accompanied by Coordination Request materials, we believe that this single limit will simplify administration of the rule without unduly constraining coordination possibilities at the ITU.

<sup>112</sup> To prevent manipulation of this limit by separate but affiliated entities, we will also apply the attribution criteria in Section 25.159(c) to entities requesting API filings. 47 C.F.R. § 25.159(c).

## 6. Confidentiality

38. *Background.* In the *Further Notice*, we proposed to treat ITU filing requests as confidential until the Commission submits the filings to the ITU.<sup>113</sup> We noted that affording this temporary confidential treatment would help prevent competing satellite operators from using information gathered from the Commission's processes to submit conflicting filings to the ITU through another Administration before the United States files an API.

39. *Discussion.* DIRECTV and Intelsat ask that we extend the confidential treatment of API materials until they are published by the ITU.<sup>114</sup> Intelsat argues that this longer period of confidentiality is necessary to ensure that competitors cannot use the Commission's processes to gain ITU priority by filing through another Administration.<sup>115</sup>

40. We adopt our proposal to treat ITU filing requests as confidential only until the Commission submits the filings to the ITU.<sup>116</sup> Because APIs are submitted electronically to the ITU and considered by date of receipt, where coordination is required, it is unlikely that a competitor could use this disclosure to file a conflicting API through another Administration that would have an earlier date of receipt. Moreover, waiting to disclose API information until it is published by the ITU would require Commission staff to constantly monitor ITU publications. Rather, we generally will make available the API and Coordination Request information once it has been forwarded to the ITU. In cases where the API and Coordination Request are submitted separately, however, we will not disclose the identity of the party requesting the API until after the Coordination Request has been submitted. For Coordination Requests, we will also issue a public notice announcing the submission to the ITU and noting the queued application.<sup>117</sup> We believe this treatment also will address the concern expressed by DIRECTV, and noted in the *Further Notice*,<sup>118</sup> that prior disclosure of an operator's plans may enable competitors to "claim jump" by submitting conflicting filings to the ITU through other administrations before the U.S. files an API on an applicant's behalf. This concern is also alleviated by the recent decision of WRC-15 to eliminate the API requirement for satellite systems subject to Article 9, Section II of the ITU Radio Regulations, many of which will be eligible for licensing under the two-step process.<sup>119</sup> Finally, if a later party files without knowledge of an earlier Coordination Request filing with queue priority, we will entertain requests by the later party to withdraw the filing, and cancel any associated bond, within 30 days of the public notice announcing the higher queue priority applicant.<sup>120</sup>

## 7. Non-U.S. Licensed Space Stations

41. *Background.* Although we did not explicitly address the issue in the *Further Notice*, SES and DIRECTV commented on the impact of an advance ITU filing process on operators of non-U.S. licensed space stations that request access to the U.S. market. SES argues that a queue position established by a request to submit ITU filings should not block a later market access request by a non-

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<sup>113</sup> See *Further Notice*, 29 FCC Rcd at 12121-22, ¶ 13.

<sup>114</sup> See Intelsat Comments at 5; DIRECTV Reply at 3. Intelsat also requests that the Commission promptly forward all ITU materials, without assessing a filing fee. Intelsat Comments at 5-6.

<sup>115</sup> Intelsat Comments at 5.

<sup>116</sup> See Appendix B, *infra* (Section 0.457(d)(1)(vii)(C)).

<sup>117</sup> See Appendix B, *infra* (Section 25.151(a)(9)). EchoStar supports issuing a public notice upon submission of Coordination Request materials to the ITU. See EchoStar Reply, Appendix A at 4-5 (proposing revisions of 47 C.F.R. § 25.151).

<sup>118</sup> *Further Notice*, 29 FCC Rcd at 12120-21, ¶ 9.

<sup>119</sup> See discussion in paragraph 20 above.

<sup>120</sup> This is similar to a request of Intelsat. See Intelsat Comments at 11-12; see also generally 47 C.F.R. § 1.1115(d).



U.S. licensed space station operator with ITU priority.<sup>121</sup> DIRECTV responds that ITU priority does not guarantee the right to serve the United States.<sup>122</sup>

42. *Discussion.* We will afford queue priority to space station license applicants that initiate their applications by submitting Coordination Request materials to the Commission for filing at the ITU. Accordingly, if a non-U.S. licensed operator files a request for access to the U.S. market after the filing of a first-step application that is deemed mutually exclusive, we generally will defer action on the market access request until after we have resolved the earlier-filed application or mutual exclusivity concerns have been eliminated through coordination between the parties involved. This is true even in cases where the foreign operator makes use of an ITU filing with an earlier date of protection than the U.S. filing relied upon by the applicant. We employ this queue procedure today when considering a request for access to the U.S. market vis-à-vis an earlier space station license application.<sup>123</sup> Any U.S. license granted, however, will be subject to the outcome of the international coordination process.<sup>124</sup> This may mean that the U.S. licensee may not be able to operate its system if the coordination cannot be appropriately completed.<sup>125</sup>

## 8. Scope

43. *Background.* In the *Further Notice*, we proposed to limit the advance ITU filing procedure to requests for operations in non-planned frequency bands because of the specificity of the ITU's regulations pertaining to operation in FSS planned bands.<sup>126</sup> We invited comment, however, as to whether the process should be available for other types of proposed space station operation.

44. *Discussion.* Several commenters recommend that we expand the scope of our advance ITU filing proposal to include operations of non-geostationary-satellite orbit (NGSO) systems, as well as GSO satellite networks in planned bands.<sup>127</sup> These parties generally assert that applicants for such other systems also benefit from submission of ITU filings in advance of a complete satellite application.<sup>128</sup> DIRECTV, however, opposes expanding the advance ITU filing process to GSO networks in planned frequency bands.<sup>129</sup> It argues that because the filing of a modification in the FSS planned bands is not subject to the six-month delay applied to Coordination Requests for GSO operation in non-planned bands, there is no reason for the Commission to expedite submission of such filings before determining that an underlying application is acceptable for filing.

45. We agree that prospective U.S. licensees of other types of satellite systems would benefit from early submission of ITU filings. For "NGSO-like" space station operation,<sup>130</sup> we will submit API

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<sup>121</sup> See SES Comments at 19.

<sup>122</sup> See DIRECTV Reply at 4.

<sup>123</sup> See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10869-70, ¶¶ 294-95.

<sup>124</sup> See *id.*, 18 FCC Rcd at 10870, ¶ 295; 47 C.F.R. § 25.111(b).

<sup>125</sup> *Space Station Licensing Reform Order*, 18 FCC Rcd at 10800, ¶ 96.

<sup>126</sup> *Further Notice*, 29 FCC Rcd at 12121, ¶ 13.

<sup>127</sup> See SIA Comments at 3 (supporting expansion to NGSO systems in non-planned FSS bands, and NGSO and GSO systems in non-planned, non-FSS bands); GVF Comments at 3 (supporting expansion to NGSO systems in non-planned FSS bands); Intelsat Comments at 4 and n.9 (supporting expansion to systems in planned bands, but taking no position on inclusion of Direct Broadcast Satellite systems); Iridium Comments at 6 (supporting SIA proposal to expand to NGSO systems); SES Reply at 12 (supporting expansion to systems in planned bands); SpaceX Reply at 5-6 (supporting expansion to NGSO systems).

<sup>128</sup> See, e.g., Intelsat Comments at 4, 5 n.9; SES Reply at 12.

<sup>129</sup> DIRECTV Reply at 3 n.11.

<sup>130</sup> See Appendix B, *infra* (Section 25.157(a)).



and Coordination Request filings prior to receiving a corresponding space station license application. Under Section 25.157, applications for such space stations are not eligible for first-come, first-served processing, and the information contained in an API or Coordination Request would be insufficient to begin a modified processing round. Therefore, the submission of ITU filings for systems proposing “NGSO-like” operation will not establish any status in the Commission’s licensing process. Similarly, we will review and forward filings in bands subject to Appendices 30 and 30A of the ITU Radio Regulations in advance of a license application, and without affording any licensing status, as applications for such Direct Broadcast Satellite systems are also presently not eligible for first-come, first-served processing.<sup>131</sup>

46. For ITU filings in the FSS bands subject to Appendix 30B, we will follow an optional procedure similar to that adopted for non-planned band operation.<sup>132</sup> Thus, ITU filings to convert an allotment into an assignment, to introduce an additional system, or to modify an assignment in the Appendix 30B List will be treated in the same manner as a Coordination Request filing for GSO FSS operation in non-planned bands.<sup>133</sup> Such filings, accompanied by a simplified Form 312 (Main Form), demonstration or certification described in the following paragraph, and an application-stage bond, will establish a position in the Commission’s space station licensing queue. The bond will similarly be forfeited in the event the party does not submit a complete space station application within two years. We disagree with DIRECTV that the absence of a six-month delay for acceptance of planned-band filings warrants substantially different treatment, given that such filings will similarly enjoy higher ITU status if submitted earlier.

47. Unlike Coordination Requests in non-planned bands, however, we will review a proposed filing under Appendices 30, 30A, or 30B prior to forwarding the filing to the ITU to ensure that it is compatible with other U.S. filings. This review is necessary to protect the rights of existing U.S. filings from being unduly eroded under the relevant ITU protection criteria by another U.S. filing. Accordingly, the party requesting a planned-band filing must either submit the results of an analysis demonstrating that the proposed operation will not “affect” any other U.S. filing under the relevant ITU criteria or, if another filing would be deemed affected, submit a letter signed by the affected operator (which may be the same as the operator requesting the new filing) that it consents to the new filing.<sup>134</sup>

48. Finally, we will apply the API and Coordination Request procedures described above, including the bond requirement and queue status, to filings and applications for 17/24 GHz BSS space stations, for the same reasons that we are applying them to GSO FSS filings and applications in non-planned bands. The Commission has established a four-degree orbital spacing environment for the 17/24 GHz BSS. Accordingly, we will presume that a full 17/24 GHz BSS space station application is mutually exclusive with a Coordination Request for co-frequency space station operation within four degrees of orbital separation. Final determination on mutual exclusivity will be done after the full application associated with the Coordination Request is received by the Commission.

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<sup>131</sup> See *Direct Broadcast Satellite Service Auction Nullified: Commission Sets Forth Refund Procedures for Auction No. 52 Winning Bidders and Adopts a Freeze on All New DBS Service Applications*, Public Notice, 20 FCC Rcd 20618 (rel. Dec. 21, 2005); *Amendment of the Commission's Policies and Rules for Processing Applications in the Direct Broadcast Satellite Service*, IB Docket No. 06-160, Notice of Proposed Rulemaking, 21 FCC Rcd 9443, 9455, ¶ 23 (2006) (proposing to adopt a first-come, first-served licensing procedure for DBS space station operation).

<sup>132</sup> See generally Appendix B, *infra* (Section 25.110(b)(3)).

<sup>133</sup> See ¶ 21, *supra*.

<sup>134</sup> See Appendix B, *infra* (Section 25.110(b)(3)(ii)).

**B. Milestone and Bond Reform – Shift from the Current Regime to Incentive Regulation**

49. As a preliminary observation concerning our decisions in this Second Report and Order respecting milestone requirements and performance bonds, we note that the Commission is adopting a revised methodology for achieving its public interest goals in these matters. Historically, the Commission has implemented a methodology involving Commission review of satellite construction progress to achieve its public interest goals respecting timely and expeditious construction and deployment of new spacecraft and the minimization of inefficient warehousing of both spectrum and orbital resources. In general terms, this approach directs the regulatee to take specific actions that, when taken by the regulatee, will result in the achievement of specific public interest goals. In practice, such regulation involves the collection of data from the regulatee, the regulator's review of such data and decisions concerning what actions the regulatee should take, commands from the regulator directing the regulatee to initiate and complete specific actions at specific times, and, finally, verification that the regulatee has, in fact, complied with the regulator's prescribed rules for mandated actions. As the record in this proceeding has clearly shown, our application of this manner of regulation to the satellite communications industry respecting the authorization, construction, and launch of spacecraft has been inefficient, time consuming, and costly for both the satellite industry and the Commission.

50. In this order, the Commission adopts a different regulatory methodology—incentive regulation—that will replace most elements of the current methodology as applied to the authorization, construction, and launch of spacecraft. While new in the present context, incentive regulation is not a new regulatory methodology to the Commission, which has applied incentive regulation to the telephone industry since the early 1980s.<sup>135</sup> In general, incentive regulation replaces the commands of the current regime with financial rewards and penalties that align the incentives of the regulatee in pursuing its own goals with the public interest goals of the regulator.

51. In the present context, we eliminate interim milestones and implement an escalating bond requirement, a type of financial incentive that encourages satellite operators to construct and launch spacecraft expeditiously or surrender their license promptly should the operator determine that its investment in constructing and operating a spacecraft is no longer in its corporate interest. Introducing incentive regulation in the present context should economize on the utilization of Commission resources, reduce the cost and burdens of regulatory compliance by satellite operators, deter inefficient warehousing of spectrum and orbital resources, and introduce modern, streamlined regulatory processes in the administration of the Commission's regulatory responsibilities.<sup>136</sup>

**C. Milestones**

52. In this Section we adopt revisions of the milestone requirements for satellite system implementation. For both GSO and NGSO satellite systems, we eliminate all milestones except the final milestone to launch and operate the authorized space stations.

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<sup>135</sup> For a thorough discussion of incentive regulation in general, see the comprehensive treatise by Jean-Jacques Laffont and Jean Tirole, *A Theory of Incentives in Procurement and Regulation* (1993). This landmark treatise surveys many types of regulatory mechanisms and approaches the application of regulation as a type of principal-agent problem. A brief introduction to incentive regulation is provided in Christopher Decker, *Modern Economic Regulation: An Introduction to Theory and Practice* Ch. 5 (2015).

<sup>136</sup> The introduction of our incentive regulation methodology is also consistent with recommendations made in the *Process Reform Report* and brings aspects of satellite regulation into alignment with the application of incentive regulation in other areas of the Commission's regulatory jurisdiction, such as the application of price-cap regulation of local exchange carriers which relies upon financial incentives to encourage carriers to reduce costs and consumer prices over time.

## 1. Background

53. The Commission has established milestone and bond requirements to deter warehousing by satellite operators before a proposed space station has been launched and begun operations.<sup>137</sup> In this instance, warehousing refers to the retention of preemptive rights to use spectrum and orbital resources by an entity that does not intend to bear the cost and risk of constructing, launching, and operating an authorized space station, is not fully committed to doing so, or finds out after accepting the license that it is unable to fulfill the associated obligations.<sup>138</sup> As we explained in the *Further Notice*, “it may be unduly easy for a licensee to acquire and warehouse orbital locations and spectrum to preclude the availability of these resources to new competitors, reducing output of satellite services in the near term and discouraging innovation over the longer term.”<sup>139</sup> The Commission’s policy and rules concerning satellite construction milestones and bond requirements are intended to offset the incentives for warehousing behavior that are harmful to both competition and consumers and to encourage the rapid deployment of new spacecraft and the optimal utilization of scarce orbital and spectrum resources.

54. Thus, the Commission requires space station licensees to adhere to standard milestone schedules.<sup>140</sup> The milestone requirements for most space station licensees are codified in Section 25.164 and are incorporated as conditions in license grants.<sup>141</sup> Recipients of new authorizations for GSO space stations, other than Direct Broadcast Satellite (DBS) and Satellite Digital Audio Radio Service (SDARS) space stations,<sup>142</sup> are required to meet the following schedule:

- Enter into a binding, non-contingent contract for construction of the authorized satellite(s) within one year of grant;

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<sup>137</sup> It has been a longstanding Commission policy to impose milestone schedules for system implementation in satellite licenses. See *Inquiry into the Development of Regulatory Policy in Regard to Direct Broadcast Satellites for the Period Following the 1983 Regional Administrative Radio Conference*, Gen. Docket No. 80-603, Report and Order, 90 FCC 2d 676, 719, ¶ 114 (1982); *MCI Communications Corporation, Application for Extensions of Time to Construct and Launch Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 2 FCC Rcd 233, 233, ¶ 5 (Com. Car. Bur. 1987); *Norris Satellite Communications, Inc., Application for Review of Order Denying Extension of Time to Construct and Launch Ka-Band Satellite System*, Memorandum Opinion and Order, 12 FCC Rcd 22299 (1997); *Morning Star Satellite Company, L.L.C., Application for Authority to Construct, Launch, and Operate a Ka-band Satellite System in the Fixed-Satellite Service at Orbital Locations 62° W.L., 30° E.L., 107.5° E.L., and 147° W.L.*, Memorandum Opinion and Order, 16 FCC Rcd 11550 (2001). In 2003, the Commission codified standard milestone requirements for U.S. space station licensees and for non-U.S. licensed space station operators granted access to the U.S. market. See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10827-38, 10875, ¶¶ 173-208, 310-312.

<sup>138</sup> See, e.g., *TMI Communications and Company, Limited Partnership and TerreStar Networks Inc., Application for Review and Request for Stay*, Memorandum Opinion and Order, 19 FCC Rcd 12603, 12604, ¶ 2 (2004); *PanAmSat Licensee Corp., Application for Authority to Construct, Launch, and Operate a Ka-Band Communications Satellite System in the Fixed-Satellite Service at Orbital Locations 58° W.L. and 125° W.L.*, Memorandum Opinion and Order, 16 FCC Rcd 11534, 11537-38, ¶ 12 (2001). Operators of in-orbit space stations might also warehouse spectrum and orbital resources, for example by allowing a gap in service before a relocated satellite is replaced. See generally *Issues Related to Allegations of Warehousing and Vertical Foreclosure in the Satellite Space Segment*, IB Docket No. 13-147, Notice of Inquiry, 28 FCC Rcd 8571 (2013) (inquiring into potential warehousing by in-orbit space station operators, including through gaps in service).

<sup>139</sup> *Further Notice*, 29 FCC Rcd at 12123, ¶ 19.

<sup>140</sup> The Commission equally imposes milestone requirements on prospective operators of non-U.S. licensed space stations that have been granted access to the U.S. market. See 47 C.F.R. § 25.137(d)(1).

<sup>141</sup> 47 C.F.R. § 25.164.

<sup>142</sup> SDARS and DBS licensees are subject to similar requirements in 47 C.F.R. §§ 25.144(b) and 25.148(b), respectively.

- Complete critical design review (CDR)<sup>143</sup> for the satellite(s) within two years of grant;
- Begin construction of the satellite(s) within three years of grant;
- Launch and commence operation of the satellite(s) in the assigned orbital location(s) within five years of grant.

Recipients of new authorizations for NGSO space stations are required to meet the following schedule:

- Enter into a binding, non-contingent contract for construction of the authorized satellite(s) within one year of grant;
- Complete CDR for the satellite(s) within two years of grant;
- Begin construction of one satellite within two years and six months of grant;
- Launch and commence operation of the first satellite in the authorized orbit within three years and six months of grant.
- Bring all authorized satellites into operation within six years of grant.

A licensee must submit a copy of its construction contract to show compliance with the first milestone requirement and submit information “sufficient to demonstrate” that it has met each subsequent milestone requirement prior to the milestones for launch and operation.<sup>144</sup> The licensee may certify that it has launched and begun operations of the space station within the parameters of its authorization.<sup>145</sup>

55. In the *2013 Report and Order*, the Commission considered proposals to codify a limited list of evidence that could be used to meet milestone requirements or replace evidentiary showings with certifications or affidavits of compliance, but did not adopt any of them.<sup>146</sup> Noting that in several cases the International Bureau had found that a certification of compliance with a milestone requirement was insufficient, the Commission said that it would not accept certifications or affidavits in lieu of “concrete evidence” of milestone compliance.<sup>147</sup> The Commission also said that it was reluctant to amend the rules to specify which types of evidence would be deemed sufficient to demonstrate completion of CDR.<sup>148</sup>

56. The *Process Reform Report* recommended that the Commission revisit the issue of milestone certifications.<sup>149</sup> In comments in response to the *Process Reform Report*, and in a petition for

<sup>143</sup> CDR is the stage in the spacecraft implementation process at which the design and development phase ends and the manufacturing phase starts. See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10833, ¶ 191 (citing *Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band*, IB Docket No. 99-81, Report and Order, 15 FCC Rcd 16127, 16178, ¶ 108 (2000) (*2 GHz MSS Order*)).

<sup>144</sup> 47 C.F.R. § 25.164(c)-(e).

<sup>145</sup> See 47 C.F.R. § 25.164(f) (citing 47 C.F.R. § 25.121(d), citing 47 C.F.R. § 25.173(b)); *2013 Report and Order*, 28 FCC Rcd at 12419, ¶ 42.

<sup>146</sup> *2013 Report and Order*, 28 FCC Rcd at 12421, ¶ 48.

<sup>147</sup> *Id.*, 28 FCC Rcd at 12421, ¶ 47 (citing *ATCONTACT Communications, LLC, Petition for Reconsideration and Motion for Stay*, Order, 25 FCC Rcd 7567 (2010); *Mobile Communications Holdings, Inc., Authority to Construct, Launch, and Operate an Elliptical Low-Earth-Orbit Mobile-Satellite Service System*, Memorandum Opinion and Order, 16 FCC Rcd 11766 (Int’l Bur. 2001), *rev. denied*, 18 FCC Rcd 11650 (2003); *Spectrum Five LLC*, Opinion and Order, 26 FCC Rcd 10448 (Int’l Bur. 2011); *EchoStar Corp.*, Memorandum Opinion and Order, 26 FCC Rcd 10442 (Int’l Bur. 2011); *Globalstar, L.P.*, Memorandum Opinion and Order, 18 FCC Rcd 1249 (Int’l Bur. 2003), *aff’d*, 19 FCC Rcd 11548 (2004)). The Commission also noted that it had not proposed or requested comment on accepting milestone certifications in the *2012 NPRM*. *2013 Report and Order*, 28 FCC Rcd at 12421, ¶ 47.

<sup>148</sup> *2013 Report and Order*, 28 FCC Rcd at 12421-22, ¶¶ 48-49.

<sup>149</sup> See *Process Reform Report* at 72-73, Recommendation 5.29. Specifically, the staff working group recommended that the Commission consider replacing some or all of the current requirements for demonstrating compliance with the milestone requirements for space station licensees with requirements for certifications. The recommendation also included a suggestion to consider increasing the financial disincentives for milestone default.

reconsideration of the *2013 Report and Order*, several parties affirm their support for allowing milestone certifications in place of evidentiary showings.<sup>150</sup>

## 2. Milestone Schedules

57. *Background.* In the *Further Notice*, we sought comment on simplifying the milestone schedules for GSO and NGSO system implementation.<sup>151</sup> Specifically, we invited comment on eliminating all milestone requirements prior to the deadline for launch; making compliance with all interim milestone rules optional, as a means to reduce the surety bond;<sup>152</sup> or eliminating the contract execution and commence construction milestones and retaining the CDR milestone as the only interim milestone requirement. We noted that each of these options could reduce administrative burdens and afford greater flexibility for licensees, and that eliminating all interim milestones would remove any need for submission of confidential construction contracts or proprietary design packages.

58. *Discussion.* Most comments on this issue support reforming the milestone schedules in some way.<sup>153</sup> EchoStar supports removing all interim milestones or making them optional.<sup>154</sup> Boeing also supports making all interim milestones optional.<sup>155</sup> These parties argue that the Commission's ultimate concern is the launch and operation of the authorized space station, and that optional interim milestones would increase flexibility and reduce burdens for operators in achieving the final, mandatory milestone.<sup>156</sup> DIRECTV and Iridium support keeping the CDR requirement as the only mandatory interim milestone;<sup>157</sup> DIRECTV would also retain the contract execution and construction commencement deadlines as optional milestones.<sup>158</sup> Intelsat, however, argues that the existing, mandatory milestone requirements are necessary to prevent speculation and warehousing.<sup>159</sup> Intelsat contends that the Commission's cancellation of space station authorizations when licensees have missed milestones deadlines underscores the continued need for mandatory milestones.<sup>160</sup> Similarly, SpaceX supports accelerated or modified,<sup>161</sup>

<sup>150</sup> See Boeing Comments in Docket 14-25 at 7; EchoStar Comments in Docket 14-25 at 6-7; SES Comments in Docket 14-25 at 3-4; Boeing Reconsideration Petition at 5-10 (filed Mar. 14, 2014). For a summary of these comments, see *Further Notice*, 29 FCC Rcd at 12125-26, ¶¶ 22-23.

<sup>151</sup> *Further Notice*, 29 FCC Rcd at 12128, ¶ 30.

<sup>152</sup> As discussed in Section IV.D.1., below, most recipients of new space station licenses or market access grants must post a surety bond payable to the U.S. Treasury in the event that they do not demonstrate compliance with a required milestone. Currently, the amount of the bond may be reduced as the Commission determines that milestone requirements have been met. In Section IV.D., below, we modify the bond requirement to eliminate these interim bond reductions and to adopt an escalating bond.

<sup>153</sup> See Boeing Comments at 7; DIRECTV Comments at 6; EchoStar Comments at 24-26; EchoStar Reply at 5-6; Iridium Reply at 12-13; see also SpaceX Reply at 8-11 (proposing stricter interim milestone deadlines for NGSO broadband satellite system authorizations). *But see* Intelsat Comments at 13-14 (arguing that the Commission "should not eliminate, or make optional, its satellite construction milestones"); Planet Labs Comments at 3 (taking no position on milestone reform, but noting the typically smaller budgets and accelerated development schedules for satellite systems employing small satellites).

<sup>154</sup> See EchoStar Comments at i, 25; EchoStar Reply at 5-6.

<sup>155</sup> See Boeing Comments at 7.

<sup>156</sup> See *id.*; EchoStar Comments at 25; EchoStar Reply at 5-6.

<sup>157</sup> See DIRECTV Comments at 6; Iridium Reply at 13. Specifically, Iridium recommends keeping at least one interim milestone requirement, and suggests that completion of CDR is the logical candidate. Iridium Reply at 13. Iridium otherwise takes no position on the various milestone and bond proposals made in this proceeding. *Id.* SES also supports retaining the CDR milestone. SES Reply at 13.

<sup>158</sup> DIRECTV Comments at 6.

<sup>159</sup> Intelsat Comments at 13-14.

<sup>160</sup> *Id.* at 14.



compulsory interim milestone requirements for “NGSO broadband satellite systems”<sup>162</sup> as a means to reduce market uncertainty by requiring periodic assessments of the licensee’s progress in satellite system implementation.<sup>163</sup> SpaceX also argues that a final milestone requirement to operate 75% of the authorized space stations would give operators a measure of flexibility for phased implementation and ultimate deployment configuration, while still requiring material commercial service and deterring warehousing.<sup>164</sup>

59. After considering the record, we adopt modified standard milestone schedules for both GSO and NGSO satellite system authorizations to eliminate all interim milestones. As stated in the *Further Notice*, eliminating the interim milestone requirements will significantly reduce administrative burdens on both licensees and the Commission associated with verifiably demonstrating, and evaluating, compliance with the milestones, saving considerable time and cost.<sup>165</sup> It will also remove the regulatory uncertainty that might otherwise exist during the time necessary to evaluate the potentially complex milestone demonstrations.<sup>166</sup> Further, it will remove any need for submission of confidential contract or design materials to the Commission to prove that the milestones have been completed.

60. We will not allow licensees to submit milestone showings as a means to reduce the surety bond.<sup>167</sup> As we explain below, we remain concerned that the milestone certifications proposed by commenters would not be sufficient, in many cases, to determine whether the licensee has met the milestone requirements elaborated in our precedent.<sup>168</sup> Under these proposals, more comprehensive evidentiary showings would continue to be required, thereby undermining the benefits of the simplified milestone schedules. Requiring a simple, escalating bond in conjunction with the streamlined milestone schedules will relieve the burden on Commission resources of administering these interim milestones while providing licensees greater certainty as to their potential liability under the bond. In any event, we note that the cost of maintaining a \$3 million or \$5 million final bond during satellite construction is nominal in comparison with the cost to implement licensed space stations, which generally cost several hundred million dollars each to launch and operate.<sup>169</sup>

61. The simplified milestone schedules we adopt here, combined with a modified, escalating bond requirement<sup>170</sup> and the Three-Strikes rule,<sup>171</sup> will also maintain adequate deterrence against warehousing and speculation. Under the escalating bond requirement, licensees’ potential liability under the bond will increase, progressively, until the final milestone requirement is satisfied.<sup>172</sup> Thus, to reduce their liability under the bond, licensees that determine they will not be able to meet the launch and

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<sup>161</sup> SpaceX Reply at 8, 10.

<sup>162</sup> SpaceX does not define the term “NGSO broadband satellite systems.”

<sup>163</sup> SpaceX Reply at 10-11.

<sup>164</sup> *Id.* at 8-9.

<sup>165</sup> *Further Notice*, 29 FCC Rcd at 12128, ¶ 30.

<sup>166</sup> *See id.*, 29 FCC Rcd at 12127, ¶ 28 (acknowledging that a considerable amount of time may ensue after a licensee certifies that it has met an interim milestone requirement before Commission staff issues a ruling on the merits of the matter).

<sup>167</sup> We discuss, and revise, the bond requirements in Section IV.D. below.

<sup>168</sup> *See* Section IV.C.3., *infra*.

<sup>169</sup> *See 2013 Report and Order*, 28 FCC Rcd at 12418, ¶ 40; *Bond Order*, 19 FCC Rcd at 12650, ¶ 31; *see also* Boeing Comments at 9.

<sup>170</sup> *See* Section IV.D.2., *infra*.

<sup>171</sup> 47 C.F.R. § 25.159(d).

<sup>172</sup> *See* Section IV.D.2., *infra*.



commence operation milestone will have an incentive simply to surrender their licenses early, rather than attempt an unsupported milestone showing. A licensee that exhibits a pattern of surrendering its authorizations prior to fulfilling the final milestone requirement, however, will continue to be subject to the “Three-Strikes” rule.<sup>173</sup>

62. In addition, under our current milestone regime, we note that even licensees that failed to meet the contract execution, CDR, or commence construction milestone requirements have often been able to hold their licenses for a considerable period of time after the missed milestone deadline. This is because such licensees frequently submitted inadequate milestone showings or unjustified milestone extension requests, which required considerable time to resolve in light of the complex nature of interim milestone review and the significant consequences of default. Thus, administration of the contract execution, CDR, and commence construction milestone requirements has not guaranteed that spectrum and orbital resources were made available quickly if the deadlines were not met. Further, this process may not change significantly even if we adopted any of the milestone certification proposals, because difficult cases may continue to arise in which additional information and review would be required. Given these safeguards and the difficulties experienced with evaluating interim milestone compliance under our precedent, we reject arguments that interim milestones are the best means to deter warehousing today.

63. Thus, we will retain only the final milestone requirements to launch and operate the authorized space stations for both GSO and NGSO system licensees.<sup>174</sup> For GSO systems, licensees will be required to launch and operate the authorized space station(s) within five years from the date the license is issued.<sup>175</sup> For NGSO systems, licensees will be required to operate the complete constellation within six years of grant.<sup>176</sup> Consistent with our current rules, we will impose the same simplified milestone requirements on grants of access to the U.S. market via proposed non-U.S. licensed space stations.<sup>177</sup>

64. Finally, we will not adopt SpaceX’s proposal to modify the final milestone requirement

<sup>173</sup> See 47 C.F.R. § 25.159(d); ¶ 35, *supra*; *Space Station Licensing Reform Order*, 18 FCC Rcd at 10836 n.463 (stating the Commission will “presume that a licensee that creates a pattern of obtaining licenses and then surrendering them before a milestone deadline is also engaging in speculative activity”); *EchoStar Corporation, Application to Operate a C-Band Geostationary Satellite Orbit Satellite in the Fixed-Satellite Service at the 84.9° W.L. Orbital Location*, Memorandum Opinion and Order, 25 FCC Rcd 10193 (Int’l Bur. 2010).

<sup>174</sup> We expect that any requests for an extension of time to meet the final milestone requirement will be filed near to the deadline and will demonstrate that, despite the licensee’s or market access recipient’s diligent efforts, circumstances beyond its control prevent compliance with the milestone requirement. See 47 C.F.R. § 25.161(a)(1); see also, e.g., *Final Analysis Communication Services, Inc., Authorization to Construct, Launch and Operate a Non-Voice, Non-Geostationary Mobile Satellite System in the 148-150.5 MHz, 400.15-401 MHz, and 137-138 MHz Bands*, Memorandum Opinion and Order, 19 FCC Rcd 4768 (Int’l Bur. 2004), *affirmed*, 30 FCC Rcd 854 (2015).

<sup>175</sup> See Appendix B, *infra* (Section 25.164(a)).

<sup>176</sup> See Appendix B, *infra* (Section 25.164(b)).

<sup>177</sup> See 47 C.F.R. § 25.137(d)(1); *Space Station Licensing Reform Order*, 18 FCC Rcd at 10875, ¶ 311. Applying the modified milestone schedules to non-U.S. licensed space station operators is a logical outgrowth of the milestone proposals in the *Further Notice* because the Commission has historically required non-U.S. licensed operators to meet the same milestone requirements as U.S. licensees. See *Further Notice*, 29 FCC Rcd at 12124, ¶ 20 (noting that the “milestone schedules also apply to construction and launch of non-U.S.-licensed space stations approved for U.S. market access”); see also *Public Service Commission of the District of Columbia v. FCC*, 906 F.2d 713, 717 (D.C. Cir. 1990) (“[I]t is well established that the exact result reached after a notice and comment rulemaking need not be set out in the initial notice for the notice to be sufficient. Rather, the final rule must be ‘a logical outgrowth’ of the rule proposed.”). The focus of the logical outgrowth test is whether commenting parties should have anticipated that the Commission might adopt the requirement at issue. *Aeronautical Radio, Inc., v. FCC*, 928 F.2d 428, 445-46 (D.C. Cir. 1991).

for “NGSO broadband satellite systems,” which is beyond the changes contemplated in the *Further Notice*.

### 3. Milestone Certifications

65. *Background.* We also requested comment as to whether we should accept certifications from space station licensees, in addition to corroborative affidavits from satellite manufacturers and proof of appropriate payment, as *prima facie* evidence of compliance with the contracting and CDR milestone requirements.<sup>178</sup> We invited comment on whether it would be useful to specify detailed requirements for such certifications.<sup>179</sup>

66. *Discussion.* In the event that we retain some or all of the interim milestone requirements, commenters support allowing certifications, with particular supporting evidence, to demonstrate milestone compliance. To this end, parties recommend content requirements for demonstrations that would satisfy each of the contract execution,<sup>180</sup> CDR,<sup>181</sup> and construction commencement<sup>182</sup> milestone requirements.<sup>183</sup> The proposed milestone showings generally comprise a certification by the licensee and/or manufacturer that the milestone has been completed, along with specific supporting evidence.

67. We will not adopt any of the proposals to specify elements of sufficient demonstrations for the contract execution, CDR, and construction commencement milestone requirements. In the *2013 Report and Order*, we rejected similar proposals for milestone certifications or affidavits.<sup>184</sup> We remain concerned that the certifications proposed by commenters, even accompanied by other proposed evidence, may not routinely allow the Commission to determine whether the licensee has actually met the criteria for compliance with the milestone requirements contained in Commission precedent. In these cases, further evidentiary submissions from licensees may be required, thereby undermining the benefits of the proposed certifications. Instead, to address the concerns raised by commenters related to the administration of these initial milestone requirements, we will eliminate the requirements altogether, as explained above. We will rely on safeguards, including the financial incentives created by the new escalating bond requirement,<sup>185</sup> rather than periodic Commission supervision of a licensee’s development progress, to provide an appropriate deterrence to warehousing behavior.

### 4. Other Proposals

68. Commenters propose two other changes to the administration of our milestone policy. First, taking up a suggestion made in response to the *Process Reform Report*,<sup>186</sup> SIA and other commenters urge the Commission to provide greater certainty in the milestone review process by specifying that milestone compliance filings will be deemed granted 60 days after submission unless the Commission takes a contrary action during that period.<sup>187</sup> As explained above, however, we eliminate the

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<sup>178</sup> *Further Notice*, 29 FCC Rcd at 12127-28, ¶ 29.

<sup>179</sup> *Id.*

<sup>180</sup> EchoStar Comments at 27; SES Comments at 14-15; *see also generally* ViaSat Comments at 13.

<sup>181</sup> Boeing Comments at 4; EchoStar Reply at 6; Intelsat Comments at 16; SES Comments at 14-15; *see also generally* SIA Comments at 5; ViaSat Comments at 12-13; DIRECTV Reply at 6.

<sup>182</sup> SIA Comments at 4; Boeing Comments at 5; EchoStar Comments at 27; Intelsat Comments at 16-17; *see also* SES Reply at 12 n.49.

<sup>183</sup> *See generally* GVF Comments at 3-4; Inmarsat Comments at 3; Spire Comments at 2.

<sup>184</sup> *See 2013 Report and Order*, 28 FCC Rcd at 12421, ¶ 47.

<sup>185</sup> *See* Section IV.D.2., *infra*.

<sup>186</sup> *See* EchoStar/Hughes Comments in Docket 14-25, at 6.

<sup>187</sup> *See* SIA Comments at 5-6; Boeing Comments at 5-6; DIRECTV Reply at 6; SES Comments at 15.

interim milestone requirements, in part to remove any need for lengthy review to determine compliance. Completion of the remaining milestone requirements, to launch and operate space stations, is generally a matter of public record and may be certified by a statement that the space station has been launched and placed in the authorized orbit and that in-orbit operation has been tested and found to be consistent with the terms of the authorization.<sup>188</sup> Review of the final milestones is typically swift, and we see no need to add the proposed 60-day deadline to our rules.

69. Second, EchoStar recommends that the Commission allow a licensee to satisfy the final milestone requirement in a new GSO space station authorization by operating any “healthy” satellite at the authorized orbital location, rather than constructing and launching the satellite it had proposed.<sup>189</sup> DIRECTV opposes this proposal, arguing that satellite operators already have the flexibility to seek to relocate an in-orbit satellite to any available orbital location, and that an operator should not be able to continue to preclude others through the use of an existing satellite rather than the new one as promised.<sup>190</sup> We will not adopt EchoStar’s proposal, which we did not seek comment on in the *Further Notice*. EchoStar’s proposal is incompatible with our decision to eliminate the interim milestone requirements for GSO space station licensees. Under the proposal, a satellite operator could secure a license for a new space station, make no efforts to procure the proposed satellite, and then, five years later, substitute an existing, “healthy” satellite<sup>191</sup> and thereby retain its license and release its liability under the bond.<sup>192</sup> This possibility would undercut the deterrent of the bond for a licensee with an available in-orbit space station in the same frequency bands, and thereby invite speculative licenses. It may also result in an older space station being substituted for a “state of the art” satellite proposed in an application, thereby depriving consumers of the benefits of the newer technology.<sup>193</sup>

#### **D. Bonds**

70. In this Section we adopt a modified bond requirement that increases liability for default over time. Under this escalating bond requirement, recipients of new space station licenses and market access grants for both GSO and NGSO satellite systems will be required to post a bond that provides for initial payment of \$1 million in the event of milestone default. Potential liability under the bond will increase progressively to final amounts of \$3 million for GSO systems five years after grant, and \$5 million for NGSO systems six years after grant.

##### **1. Current Requirements**

71. Under Section 25.165, the recipient of a new license<sup>194</sup> for a GSO space station of any type other than DBS and SDARS must post a surety bond in the amount of \$3 million, payable to the U.S. Treasury in the event of a milestone default, and the recipient of a new license for an NGSO constellation

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<sup>188</sup> See 47 C.F.R. § 25.164(f).

<sup>189</sup> EchoStar Comments at 25-26. EchoStar suggests requiring the licensee to request a modification of the new space station license at least one year before the final milestone, in order to provide sufficient time for public notice of the planned use of the existing satellite and its technical parameters. *Id.*

<sup>190</sup> See DIRECTV Reply at 6.

<sup>191</sup> EchoStar does not suggest any criteria by which the Commission could determine whether an in-orbit satellite is “healthy” for this purpose. The need to develop and implement such criteria also weighs against adopting EchoStar’s proposal.

<sup>192</sup> Further, under EchoStar’s proposal the failure to launch and operate the proposed satellite would not count as a missed milestone under the “Three-Strikes” rule. See 47 C.F.R. § 25.159(d).

<sup>193</sup> See, e.g., *Star One, S.A., Petition for Declaratory Ruling to be Added to the Permitted List*, Order, 25 FCC Rcd 14338 (Int’l Bur. 2010).

<sup>194</sup> Recipients of U.S. market access grants for non-U.S. licensed space stations that are not in-orbit and operating are also subject to the bond requirement. See 47 C.F.R. § 25.137(d)(4).

must file a surety bond in the amount of \$5 million.<sup>195</sup> The Commission adopted the bond requirement to establish a market-based mechanism for ensuring that licensees are willing and able to proceed with satellite construction and to discourage warehousing of scarce resources.<sup>196</sup> The bond amount is successively reduced when the Commission finds that the licensee has met interim milestone requirements. Specifically, the amount of a GSO licensee's bond is reduced in increments of \$750,000 for each milestone met, and the amount of an NGSO licensee's bond is reduced in increments of \$1 million.<sup>197</sup> In the event that a licensee fails to meet a milestone deadline and the Commission does not find good cause for granting an extension of time, the license becomes void and the remaining bond amount is paid to the U.S. Treasury.<sup>198</sup>

## 2. Escalating Bond

72. *Background.* In the *Further Notice*, we invited comment on adopting an escalating bond requirement. Under this proposal, the amount to be paid in the event a licensee surrenders a space station authorization without placing the authorized facility into operation, or is found in default of a milestone deadline, would increase progressively, *pro rata*, in proportion to the time that had elapsed since the license was granted.<sup>199</sup> Initial liability would be set at an amount intended to be substantial enough to deter parties from filing applications for strategic motives.

73. *Discussion.* Several commenters support adoption of an escalating post-grant bond requirement.<sup>200</sup> Boeing, EchoStar, and SES contend that an escalating bond approach would encourage licensees to surrender more quickly authorizations that will not ultimately be put to use.<sup>201</sup> Boeing also argues that a lower starting bond value would encourage new entrants and innovative services.<sup>202</sup> Intelsat, however, opposes adopting an escalating bond requirement.<sup>203</sup> Intelsat disagrees that an escalating bond would create significant financial incentives for early surrender of licenses, because the investments required to progress from one milestone to the next already increase the cost of abandonment of the license over time.

74. After consideration of the record, we adopt an escalating post-grant bond requirement. Several commenters agree with our assessment that, by increasing over time the potential payment liability under the bond, an escalating bond will create a financial incentive for unprepared or speculative licensees, or licensees whose business plans change, to surrender their authorizations early.<sup>204</sup> Contrary to

<sup>195</sup> 47 C.F.R. § 25.165. Authorizations for replacement satellites, as defined in Section 25.165(e), are not subject to the bond requirement. See 47 C.F.R. § 25.165(a), (e). The Commission affords the same treatment to requests for market access via non-U.S. licensed replacement satellites. See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10879-80, ¶ 324.

<sup>196</sup> *Bond Order*, 19 FCC Rcd at 12645-46, ¶¶ 17, 19.

<sup>197</sup> 47 C.F.R. § 25.165(d).

<sup>198</sup> See 47 C.F.R. §§ 25.161(a)(1), 25.165(c).

<sup>199</sup> *Further Notice*, 29 FCC Rcd at 12129, ¶ 32.

<sup>200</sup> See Boeing Comments at 8-9; EchoStar Comments at 28-29; EchoStar Reply at 7; see also SES Comments at 15-16 (stating that while it does not consider bond reform to be a priority, SES would support an escalating bond).

<sup>201</sup> See Boeing Comments at 8-9; EchoStar Comments at 28-29; EchoStar Reply at 7; SES Comments at 15-16; SES Reply at 14.

<sup>202</sup> See Boeing Comments at 9.

<sup>203</sup> Intelsat Comments at 19; Intelsat Reply at 10-11.

<sup>204</sup> See, e.g., EchoStar Reply at 7 (an escalating bond “incentivizes satellite operators to surrender licenses to spectrum and orbital locations that will go unused on the soonest date possible”); SES Reply at 14 (an escalating bond “encourage[s] return of unused spectrum earlier rather than later”). In 2004, the Commission concluded that it would be more reasonable to reduce bond payment liability, rather than increase it, as interim milestone

(continued....)

Intelsat's claim, this is true even after the licensee has begun to invest in its proposed satellite system if the licensee believes it may ultimately default on its obligation to timely launch and operate its satellite system, and thereby lose its license and forfeit a higher bond value. In addition, as explained above, we also eliminate the interim milestones entirely. Thus, speculative licensees wishing to limit their liability under the bond will no longer have an incentive to submit an inadequate milestone demonstration, and thereby tie up Commission resources, during this initial period. Rather, their incentive will be simply to surrender the license.

### 3. Bond Amounts

75. *Background.* We also asked in the *Further Notice* whether the currently prescribed bond amounts, which have not been adjusted in a decade, continue to be adequate to deter warehousing or whether they should be increased. To accommodate automatically the effects of inflation in the future, we proposed to require bond payment amounts due in the event of default to be calculated based on the Gross Domestic Product Chain-type Price Index (GDP-CPI).<sup>205</sup> We requested comment on an initial potential payment liability of \$400,000 for GSO system licensees under the escalating bond proposal.<sup>206</sup> We also invited comment generally on the appropriate amounts of bond payment liability under the escalating bond approach. Finally, we sought comment on how our options with respect to bond and milestone requirements should interact, including whether we should make all interim milestones optional, index bond requirements to inflation, set the bond requirement for NGSO and GSO stations at \$1 million to start and increasing by \$1 million each year, set a minimum bond requirement of \$1 million, and set the interim-milestone bond reduction amount at \$1 million.<sup>207</sup>

76. *Discussion.* Most commenters on the issue oppose any increase in the bond amounts above current levels.<sup>208</sup> Two parties, however, advocate increasing the bond amounts in some fashion.<sup>209</sup> Supporting an escalating bond requirement, Boeing suggests that the bond start at a value of \$1 million, and increase by \$1 million each year if the licensee does not demonstrate compliance with optional interim milestones.<sup>210</sup> SpaceX proposes a scaled bond approach for "NGSO broadband satellite systems" that varies by the size of the system: \$5 million for systems of 1-99 satellites; \$10 million for systems of 100-999 satellites; and an additional \$5 million for each additional 1,000 satellites.<sup>211</sup> Intelsat opposes reducing the initial bond payment amount for GSO system licensees from the current \$3 million value, arguing that doing so could permit entities to obtain a license that are unable or unwilling to construct, launch, and operate the proposed satellite.<sup>212</sup>

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requirements are met because: i) successively increasing the bond amount as interim milestones are met would maximize the expense of maintaining a bond at the time when the main construction costs are incurred and ii) licensees that meet interim milestones are more likely to complete satellite construction. *Bond Order*, 19 FCC Rcd at 12656, ¶ 51. This rationale presupposes the existence of interim milestone requirements; however, in Section IV.C.2. above we eliminated all interim milestones for both GSO and NGSO system licensees. We believe that without interim milestones an escalating bond requirement is preferable to a fixed bond requirement or an automatically decreasing bond requirement because the escalating bond will encourage early surrender of licenses for proposed systems that will not ultimately be implemented.

<sup>205</sup> *Further Notice*, 29 FCC Rcd at 12128-29, ¶ 31.

<sup>206</sup> *Id.* We assumed that the final bond payment liability in this case would be a baseline amount of \$4 million.

<sup>207</sup> *Id.*, 29 FCC Rcd at 12129, ¶ 32.

<sup>208</sup> See SIA Comments at 6; GVF Comments at 3-4; EchoStar Comments at 27; DIRECTV Comments at 5.

<sup>209</sup> See SpaceX Reply at 10-11; Boeing Comments at 8-9.

<sup>210</sup> Boeing Comments at 8-9.

<sup>211</sup> SpaceX Reply at 11.

<sup>212</sup> See Intelsat Comments at 19; Intelsat Reply at 10-11.



77. After review of the record, we will specify an initial bond payment liability of \$1 million for both GSO system licensees and NGSO system licensees under our modified escalating bond requirement. We believe that this amount, the higher of the two initial amounts suggested in the *Further Notice*, is substantial enough to deter many applicants from filing applications for strategic motives with the intention of surrendering their licenses shortly after grant. Licensees that do repeatedly surrender their authorizations before satisfying the final milestone requirements may be subject to a lower limit on additional space station applications under the “Three-Strikes” rule.<sup>213</sup> At the same time, this amount may encourage more applications for new and innovative satellite services than the current \$3 million or \$5 million initial bond payment liabilities.<sup>214</sup>

78. We will also retain the current bond amounts of \$3 million for GSO system licenses and \$5 million for NGSO system licenses as the final payment amounts potentially due under the escalating bond. The record does not support increases in bond amounts at this time. We will not adopt SpaceX’s suggestion to create a separate bond category for “NGSO broadband satellite systems.” As with its milestones proposal, SpaceX first presented this recommendation in reply comments, and no other party has commented on it. Based on this limited record, we decline to increase significantly the final bond payment amounts for an undefined class of large NGSO systems without further exploring the issue.

79. Our proposal to index bond amounts to GDP-CPI to account for inflation found no support among commenters.<sup>215</sup> SIA argues that subjecting licensees to continual increases in bond amounts would be unduly burdensome and would create regulatory uncertainty.<sup>216</sup> Parties also doubt whether the marginal increases in bond amounts due to inflation would provide additional deterrence against speculation.<sup>217</sup> In addition, the Surety Association indicated that a bond requirement indexed to inflation could be difficult to underwrite.<sup>218</sup> On further consideration, we will not adopt our proposal to require bond payment amounts due in the event of default to be indexed based on the GDP-CPI, which was opposed by all commenting parties. Although automatically adjusting the bond amounts in this manner would more closely maintain their deterrent value in the future, it may also complicate administration and underwriting of the bond. We prefer instead to retain stable payment amounts. This structure is simpler and should provide licensees greater certainty as to their potential liability without significantly reducing the deterrence of the bond requirement.

80. Thus, under the modified bond requirement we adopt today, a GSO system licensee must file a surety bond requiring initial payment in the case of license surrender of at least \$1 million. The payment amount due to the U.S. Treasury under the bond will increase, *pro rata*, in proportion to the time that has elapsed since the license was granted to the time of the launch and operate milestone. The amount of the bond itself at any given time, however, must be sufficient to cover the amount due to the Treasury if the licensee were to surrender its license, and may be set at a fixed value that is increased yearly to cover the maximum potential liability in the upcoming year.<sup>219</sup> The payment due upon failing to

<sup>213</sup> See 47 C.F.R. § 25.159(d).

<sup>214</sup> See generally *Bond Order*, 18 FCC Rcd at 12654, ¶ 42 (“[B]ond amounts should be high enough to deter speculative applications, without discouraging new or innovative satellite applications.”).

<sup>215</sup> See Intelsat Comments at 18; Boeing Comments at 6; DIRECTV Comments at 5; Intelsat Reply at 10-11; SES Reply at 14; see also SIA Comments at 6 and EchoStar Comments at 27 (opposing any proposals for increasing bond amounts above existing levels); GVF Comments at 3-4 (concurring with SIA’s comments on bond and milestone requirements).

<sup>216</sup> SIA Comments at 6; see also EchoStar Comments at 27.

<sup>217</sup> See Intelsat Comments at 18; Boeing Comments at 6.

<sup>218</sup> See Surety Association Comments at 2.

<sup>219</sup> We believe that the bond market will be able to accommodate this requirement. See Letter from Robert J. Duke, Corporate Counsel, The Surety & Fidelity Association of America, to Marlene H. Dortch, Secretary, FCC (filed Aug. 21, 2015) (stating that “a surety could increase the penal sum of a bond by fixed amounts annually, via riders, (continued....)



meet the milestone to launch and operate the authorized space station after five years will be \$3 million. Thus, for example, if a GSO system licensee surrenders its authorization two years after grant, the amount due would be equal to the \$1 million baseline amount plus a *pro rata* amount of the remaining \$2 million maximum, or  $\$1,000,000 + \$2,000,000 \times (2 \text{ (years)}/5 \text{ (years)})$ , or \$1,800,000.

81. NGSO system licensees will be required to post a surety bond requiring initial payment in the case of surrender of at least \$1 million as well. Payment liability will increase, *pro rata*, in the same manner, to a final bond payment value of \$5 million after six years.<sup>220</sup>

82. We believe that an escalating bond requirement in the amounts we are prescribing, combined with the simplified milestone schedules, will deter warehousing of satellite spectrum more efficiently than is done today. In 2003, the Commission adopted a first-come, first-served procedure for licensing of most GSO space stations.<sup>221</sup> At the same time, the Commission adopted a number of safeguards against warehousing under the new processing regime. These safeguards, most notably the current milestone requirements and a post-licensing bond requirement,<sup>222</sup> were designed to reflect the market for satellite spectrum then available, when the Commission routinely received several mutually exclusive license applications for any given frequency band and orbit location.

83. Today, however, the most popular frequency bands for satellite operation, such as the conventional C- and Ku-bands, are increasingly unavailable for space station licensing due to the more extensive operations in these bands. In bands less extensively used, such as the 36-51.4 GHz band, there is significant unused capacity. Accordingly, the bond amounts of the escalating bond, and our streamlined milestone requirements, are designed to strike a more appropriate balance between encouraging new satellite service and deterring harmful warehousing behavior.

#### 4. Corporate Guarantee

84. Finally, as an alternative to the surety bond, EchoStar proposes that a licensee meeting certain financial qualifications be allowed to use a corporate guarantee of payment in the event that the licensee defaults on its milestone obligations.<sup>223</sup> DIRECTV supports affording licensees this added flexibility to satisfy the financial requirement.<sup>224</sup> Though not opposed to a corporate guarantee alternative in principle, Intelsat argues that EchoStar's formulation is "too amorphous" to be adopted.<sup>225</sup>

85. We will not allow a licensee to submit a corporate guarantee in lieu of posting a surety bond. A corporate guarantee would remove the market-based mechanism incorporated in the bond requirement that includes the financial community in determining whether the licensee is likely to

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to accommodate a requirement by the Commission that a licensee's potential payment liability increase progressively over time").

<sup>220</sup> We also make consequential changes to the bond requirements for proposed non-U.S. licensed space stations that have been granted access to the U.S. market but are not in orbit and operating. See 47 C.F.R. § 25.137(d)(4). These changes are a logical outgrowth of our proposed changes to Section 25.164, which contain the identical bond requirements for U.S. space station licenses.

<sup>221</sup> See Section IV.G., *infra*; *Space Station Licensing Reform Order*, 18 FCC Rcd 10760.

<sup>222</sup> When first adopting the post-license bond requirement in 2003, the Commission prescribed bond amounts of \$5 million for GSO-like satellite licenses and \$7.5 million for NGSO-like satellite system licenses on an interim basis. *Space Station Licensing Reform Order*, 18 FCC Rcd at 10825, ¶ 168. The next year, in response to a Notice of Proposed Rulemaking on the issue, the Commission reduced these bond amounts to the current values of \$3 million for GSO licenses and \$5 million for NGSO licenses, in order to encourage applications for new or innovative services. See *Bond Order*, 18 FCC Rcd at 12654, ¶ 44.

<sup>223</sup> EchoStar Comments at 28-30.

<sup>224</sup> See DIRECTV Reply at 6.

<sup>225</sup> Intelsat Reply at 11-12.

construct and launch its proposed satellite system.<sup>226</sup> It may also provide an insufficient assurance of payment in the event of bankruptcy of the company acting as guarantor.<sup>227</sup> Moreover, under the new escalating bond, we reduce the initial potential payment liability under the bond. The initial costs of maintaining the bond should be reduced accordingly.

**E. Treatment of Licenses with Interim Milestone Requirements**

**1. Licensees with Outstanding Interim Milestone Requirements**

86. We will apply the modified bond and milestone requirements to space station licenses and grants of market access granted after the new rules come into effect.<sup>228</sup> In addition, we anticipate that space station licensees and market access recipients with existing grants at the time the new rules come into effect may also wish to proceed under the new bond and milestone regime. In that case, the space station grantee would submit a letter request to replace its current milestone schedule and bond obligation with the single, final milestone and escalating bond requirement. In addition, the space station operator would submit a new or modified bond and be relieved of the obligations under its previous milestone schedule. Existing licensees and market access recipients will also have the option to continue under the bond and milestone conditions established in their grants under the rules currently in effect.

**2. Authorizations with Pending Milestone Determinations**

87. Pending before the International Bureau and the Commission are a number of requests for interim milestone determinations for space station licenses and market access grants that have been surrendered, in some cases years ago.<sup>229</sup> Processing these requests as required by Section 25.164 is extraordinarily time-consuming and resource-intensive, as we have previously noted. And, each of these licenses and grants has been surrendered and made available to others, thus minimizing “warehousing” concerns. Accordingly, we direct the International Bureau to dispose of these pending milestone determination requests by waiving the requirements of Section 25.164 as needed. These licensees and grantees, of course, will forfeit the remainder of their respective bonds, for which no interim milestone showings have been made.

88. The Commission may waive any rule for good cause.<sup>230</sup> Waiver is appropriate if special circumstances warrant a deviation from the general rule, and the deviation will serve the public interest.<sup>231</sup> We believe that there is a basis for a good cause finding for waiver of the requirement that the Commission evaluate the milestone showings that have been submitted in these cases. Critically evaluating the milestone showings of licensees and grantees ensures that they are progressing with implementation of the proposed satellite system while they are precluding others from being regularly authorized to use the same spectrum and orbital resources. Once the license or grant has been

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<sup>226</sup> See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10825, ¶ 167.

<sup>227</sup> See generally *Bond Order*, 18 FCC Rcd at 12666-67, ¶¶ 78-80 (declining to adopt an escrow alternative to the bond requirement).

<sup>228</sup> See Section IV.HH., *infra*.

<sup>229</sup> See *115 LICENSE SUBSIDIARY, LLC, 17/24 GHz Broadcasting-Satellite Service Space Station at the 115.0° W.L. Orbital Location; Ruling on Milestones Completion*, Order, 30 FCC Rcd 2759 (Int'l Bur. 2015) (application for review pending); *EchoStar Corporation*, IBFS File Nos. SAT-LOA-20020328-00052, SAT-LOA-20020328-00051, SAT-LOA-20070105-00001, SAT-LOA-20070105-00003, SAT-LOA-20020328-00050; *Hughes Network Systems, LLC*, IBFS File No. SAT-LOA-20111223-00248.

<sup>230</sup> 47 C.F.R. § 1.3.

<sup>231</sup> See *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

surrendered, evaluating or re-evaluating any milestone showings that have been submitted serves to determine whether the bond amount may be reduced before it becomes forfeit to the U.S. Treasury.<sup>232</sup>

89. In each of the pending cases,<sup>233</sup> the license or grant of market access was surrendered, and the spectrum and orbital resources have been made available for reassignment.<sup>234</sup> Therefore, conducting or re-examining a detailed assessment of milestone compliance at this time would continue to consume scarce Commission resources and divert efforts from implementation of the new milestone and bond regime without resulting in faster provision of service to the public. In addition, the deterrent value of strictly enforcing milestone requirements, even for licenses that have been surrendered, is less important given that the Commission will no longer perform such interim determinations under the new milestone regime. Accordingly, we direct the International Bureau to consider granting waivers of the milestone rules in the pending cases cited above with these considerations in mind, and to reduce the bond amount when and to the extent warranted.

90. To encourage further the surrender of licenses granted under the current bond and milestone regime that will not ultimately be put to use, we also direct the International Bureau to consider waiving Section 25.164 as appropriate regarding milestone demonstrations submitted prior to the adoption of this Second Report and Order for all licenses and market access grants surrendered within 30 days of release of this Second Report and Order.

#### **F. The Two-Degree Spacing Policy**

91. In this Section we revise the Commission's two-degree spacing policy for GSO FSS systems to afford greater flexibility to coordinated, non-routine operations, to reduce administrative burdens, and to expand the policy to apply to operation in additional frequency bands.

##### **1. Background**

92. The Commission has adopted a licensing policy for GSO FSS space station operation that is predicated upon two-degree spacing. "Two-degree spacing" refers to angular separation in the GSO arc between adjacent co-frequency space stations. The two-degree spacing policy was adopted to increase, to the maximum feasible extent, the number of orbital locations from which GSO FSS space stations can provide service in the United States.<sup>235</sup> The policy applies to operation in the conventional C-band,<sup>236</sup> the conventional and extended Ku-bands,<sup>237</sup> and the conventional Ka-band,<sup>238</sup> and is embodied in rules governing the licensing of both earth station operation and space station operation.

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<sup>232</sup> See 47 C.F.R. §§ 25.137(d)(4), 25.165(d).

<sup>233</sup> See note 229, *supra*.

<sup>234</sup> See *Policy Branch Information, Actions Taken*, Public Notice, 29 FCC Rcd 14861 (rel. Dec. 12, 2014); *Star One Order*, 25 FCC Rcd 14338.

<sup>235</sup> See *Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions*, CC Docket No. 81-704, Report and Order, 48 FR 40233 (1983); *Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite Service Use*, IB Docket No. 98-172, Report and Order, 15 FCC Rcd 13430 (2000) (*18 GHz Report and Order*).

<sup>236</sup> The "conventional C-band" refers to the 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space) FSS frequency bands. See 47 C.F.R. § 25.103.

<sup>237</sup> The "conventional Ku-band" refers to the 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) FSS frequency bands. See *id.* As the term is currently defined in Part 25, the "extended Ku-band" refers to the 10.7-11.7 GHz (space-to-Earth), 12.75-13.25 GHz (Earth-to-space), and 13.75-14.0 GHz (Earth-to-space) FSS frequency bands. See *id.* As explained below, in this Second Report and Order we redefine the term "extended Ku-band" to exclude the planned FSS bands 10.70-10.95 GHz (space-to-Earth), 11.20-11.45 GHz (space-to-Earth), and 12.75-13.25 GHz (space-to-Earth). Our use of the term in this document is consistent with the revised definition that we are adopting.

93. Currently, applicants for earth station licenses authorizing transmission to GSO FSS space stations in the conventional C-band, conventional or extended Ku-band, or conventional Ka-band must demonstrate one of two things with respect to uplink operation. One option is to show that the proposed earth stations will meet “routine” limits on off-axis EIRP density (or equivalent limits on off-axis antenna gain and input power density) designed to ensure compatibility with co-frequency GSO space stations at orbital locations two or more degrees from the “target” satellites that the earth stations would communicate with. Alternatively, for proposed operation that would exceed the relevant routine limits, an applicant must submit certification from the operator(s) of the target satellite(s) that it has coordinated the proposed non-routine uplink operation with operators of co-frequency GSO space stations within six degrees of the target satellite(s), and the applicant must certify that it will operate in compliance with the coordination agreements.<sup>239</sup>

94. Furthermore, in the event that another co-frequency satellite subsequently commences operation at a location within six degrees of a satellite with which such a non-routine earth station is communicating, the earth station operator will have to reduce input power to the extent necessary to reduce off-axis EIRP density to levels within routine limits unless the operator of the new satellite consents to continuance of the non-routine uplink operation in a coordination agreement with the target satellite operator.<sup>240</sup> Moreover, except as may be provided in coordination agreements, operators of receive earth stations with antennas not meeting routine limits on off-axis gain are not entitled to protection from interference from downlink operation that would not disrupt their downlink reception if their antennas’ gain patterns conformed to routine limits.<sup>241</sup>

95. Applicants for GSO FSS space station authorizations must demonstrate the following with a technical analysis: (i) their downlink transmissions are compatible with reception of co-frequency downlink transmissions from any previously authorized GSO space station less than two degrees away or with reception of co-frequency downlinks from a current or future GSO space station two degrees away by earth stations with gain patterns consistent with the relevant routine limits in Section 25.209, and (ii) uplink transmissions to their space stations are compatible with uplink reception of any previously authorized GSO space station less than two degrees away or with uplink reception of a current or future satellite two degrees away.<sup>242</sup> Space station applicants have routinely requested permission to deviate from parameters assumed for purposes of such interference analysis when permitted under the terms of subsequent coordination agreements, and the Commission has routinely granted such requests.

96. Thus, under current rules and practice, operating authority may be obtained, based on coordination agreements, for a GSO FSS system that does not conform to technical limits for two-degree compatibility. In the event that a two-degree-compliant U.S.-licensed space station subsequently commences co-frequency operation at an adjacent orbital location, the operator(s) of the non-routine space station and/or associated earth stations will have to curtail non-routine transmit operation adversely affecting the newcomer’s system unless the newcomer consents to it, and will have to accept any downlink interference from the newcomer resulting from the use of earth station antennas with non-routine gain patterns or any uplink interference.

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<sup>238</sup> In this Second Report and Order, we define the term “conventional Ka-band” to mean the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30.0 GHz bands that the Commission has designated as primary for GSO FSS operation. See Section IV.K.1., *infra*.

<sup>239</sup> See 47 C.F.R. §§ 25.134(a), (b), (g), 25.138(a), (b), 25.218, 25.220, 25.221(b), 25.222(b), 25.226(b), 25.227(b).

<sup>240</sup> See 47 C.F.R. §§ 25.138(c), 25.220(d)(2), 25.221(a)(2)(ii), 25.222(a)(2)(ii), 25.226(a)(2)(ii), 25.227(a)(2)(ii).

<sup>241</sup> The routine gain limits are specified in 47 C.F.R. § 25.209(a) and (b). The protection rule is codified in 47 C.F.R. § 25.209(c)(1).

<sup>242</sup> These requirements are codified in 47 C.F.R. § 25.140(a).

97. The *Process Reform Report* and its associated comments include recommendations to modify the Commission's two-degree spacing policy.<sup>243</sup> The recommendations range from eliminating the two-degree spacing policy and relying on coordination between operators based on ITU priority,<sup>244</sup> to allowing certifications of compliance with routine limits,<sup>245</sup> to expanding the routine technical criteria for two-degree compatibility to cover additional frequency bands.<sup>246</sup> Several of the recommendations formed the basis of proposals and questions in the *Further Notice*.

## 2. Retaining the Two-Degree Spacing Policy

98. *Background.* As an initial matter, the *Further Notice* proposed to reaffirm the view that the two-degree spacing policy continues to be useful and that eliminating it altogether would not serve the public interest.<sup>247</sup> We noted that the policy facilitates expeditious application processing and reduces costs for applicants willing to operate within the predetermined technical criteria for two-degree spacing compatibility. We invited comment, however, on a recommendation by Intelsat in comments on the *Process Reform Report* to eliminate the two-degree spacing policy and resolve conflicts between operators of U.S.-licensed space stations based on ITU filing dates.

99. *Discussion.* Intelsat argues that the two-degree spacing policy should be eliminated, for two main reasons. First, Intelsat asserts that the policy undermines the ability of U.S.-licensed satellite operators to offer services that rely on the use of high power output to earth stations with small antennas.<sup>248</sup> Intelsat observes that even when non-two-degree-compliant operations are permitted through coordination agreements, the non-routine operator may be required to cease providing service in the event a later-authorized, adjacent operator does not agree to accommodate the existing, non-routine operations through coordination.<sup>249</sup> Second, Intelsat contends that the policy disadvantages U.S.-licensed satellite operators vis-à-vis non-U.S. licensed satellite operators with market access in the United States.<sup>250</sup> Intelsat argues that, while U.S.-licensed satellite operators must abide by two-degree limits if higher levels cannot be coordinated, even with respect to non-U.S. licensed space station operations utilizing a foreign ITU filing with lower priority than the U.S. filing, it is unclear whether the United States could require a non-U.S. licensed operator with ITU priority to abide by two-degree limits to protect an adjacent U.S. operator with lower ITU priority. In addition, Intelsat argues that the two-degree spacing policy is outdated because space station operators routinely operate at non-routine power levels under coordination agreements,<sup>251</sup> and that two-degree spacing rules can delay processing of space station applications in instances where the applicability of the policy is contested.<sup>252</sup>

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<sup>243</sup> See *Process Reform Report* at 72, Recommendation 5.28; *Further Notice*, 29 FCC Rcd at 12132, ¶¶ 40-43 (summarizing relevant comments).

<sup>244</sup> Intelsat Comments in Docket 14-25 at 5-7.

<sup>245</sup> DIRECTV Comments in Docket 14-25 at 9-10; EchoStar Comments in Docket 14-25 at 12.

<sup>246</sup> SES Comments in Docket 14-25 at 4.

<sup>247</sup> *Further Notice*, 29 FCC Rcd at 12132, ¶ 44.

<sup>248</sup> See Intelsat Comments at 20. For example, Intelsat argues that providing mobility services to airlines is a growing sector within the satellite industry, but requires power levels greater than the routine criteria set forth in the two-degree spacing rules. *Id.*

<sup>249</sup> See *id.* at 21.

<sup>250</sup> *Id.* at 21-23; Intelsat Reply at 6-7.

<sup>251</sup> Intelsat Comments at 19-20.

<sup>252</sup> *Id.* at 21-22.



100. The other commenters that address this issue defend the general policy of establishing licensing criteria based on two-degree orbital spacing.<sup>253</sup> DIRECTV, EchoStar, and ViaSat concur with our proposed view that the two-degree spacing policy expedites processing of applications for operation conforming to routine criteria.<sup>254</sup> In addition, EchoStar and SES argue that the two-degree spacing policy facilitates market entry by establishing a baseline set of operational levels at which prospective space station operators know they may provide service.<sup>255</sup> Similarly, ViaSat contends that the policy has enabled a stable operating environment for both existing and new system operations, and that eliminating the policy could result in non-routine incumbent operations precluding new entrants from commencing operations, which ViaSat claims is an increasing risk as the GSO arc becomes saturated.<sup>256</sup>

101. In response to Intelsat's concern that the two-degree spacing policy threatens continuity of service for non-routine operations, SES suggests that, rather than eliminating the policy altogether, the Commission modify the rules to provide more certainty that non-routine operations may continue upon the arrival of an adjacent space station operator unwilling to accept the existing, non-routine use through coordination.<sup>257</sup> SES also argues that, contrary to another of Intelsat's claims, the Commission applies the two-degree spacing rules equally to U.S.-licensed space station operators and non-U.S. licensed space station operators granted access to serve the United States.

102. Finally, Iridium opposes eliminating the two-degree spacing policy as it applies to the 29.25-29.5 GHz band,<sup>258</sup> a portion of which Iridium uses to operate feeder uplinks for its NGSO mobile-satellite service (MSS) satellite constellation. Iridium observes that the Commission has adopted a band plan and coordination requirements for these frequencies that differ from their international allocation. Iridium asserts, therefore, that it would be inappropriate to apply ITU filing priority to domestic coordination between GSO FSS earth stations and NGSO MSS feeder links proposed for operation in this band.

103. We retain our longstanding policy of applying routine technical criteria for GSO FSS operation premised on two-degree orbital separation between space stations. As noted in the *Further Notice*, the two-degree spacing policy facilitates expeditious application processing and reduces costs for applicants willing to operate within the predetermined criteria. The policy can also facilitate new market entry, provide a more certain interference environment, and maximize efficient use of the geostationary arc. In contrast, relying on ITU filing priority as the basis for protection rights and coordination requirements between GSO FSS systems licensed by the Commission or approved for U.S. market access could upset existing coordination agreements between operators. Moreover, the two-degree spacing policy applies to all U.S.-licensed space station operations and to non-U.S. licensed space station operations that fall within the scope of a grant of U.S. market access.<sup>259</sup> Thus, the two-degree spacing policy does not favor or disfavor U.S.-licensed operators with respect to non-U.S. licensed operations

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<sup>253</sup> See DIRECTV Comments at 6-7; DIRECTV Reply at 4; EchoStar Comments at 30-31; EchoStar Reply at 7-9; SES Comments at 3-6; SES Reply at 2-6; Iridium Comments at 3-4; Iridium Reply at 4; ViaSat Reply at 6-8.

<sup>254</sup> DIRECTV Comments at 6-7; EchoStar Comments at 30-31; ViaSat Reply at 6.

<sup>255</sup> See SES Comments at 4-5; EchoStar Reply at 7-8.

<sup>256</sup> ViaSat Reply at 7.

<sup>257</sup> SES Comments at 5-6.

<sup>258</sup> Iridium Comments at 3-4; Iridium Reply at 4.

<sup>259</sup> See, e.g., *Space Station Licensing Reform Order*, 18 FCC Rcd at 10872, ¶ 300; *Telesat Canada, Petition for Declaratory Ruling For Inclusion of Anik F2 on the Permitted Space Station List, Petition for Declaratory Ruling to Serve the U.S. Market Using Ka-band Capacity on Anik F2*, Order, 17 FCC Rcd 25287, 25296-97, ¶¶ 27-29 (Int'l Bur. 2002); *Telesat Canada, Request for Declaratory Ruling or Petition for Waiver on Earth Stations' Use of ANIK E1 and ANIK E2 Satellite Capacity to Provide Basic Telecommunications Service in the United States*, Order, 15 FCC Rcd 3649, 3654-55, ¶¶ 14-17 (Int'l Bur. 1999).

with market access in the United States, and Intelsat's assertions to the contrary provide no basis to discard the policy. No foreign-licensed space station operator that has been granted U.S. market access has argued to the contrary in this proceeding.<sup>260</sup>

104. As proposed in the *Further Notice*, we will address the issues related to continuity of service for non-routine operations by amending the policy, as described below, rather than by eliminating it altogether and sacrificing the additional benefits it provides. Specifically, we allow existing operators to continue transmitting above routine levels in bands where two-degree rules apply and increase the routine limits on transmission levels in some of these bands. We recognize that these modifications may not ensure full protection for existing, non-routine operation such as sensitive earth station operations, so that "satellite operators serving the U.S. cannot rely on operational levels previously coordinated in good faith."<sup>261</sup> And we recognize that satellites subject to coordination agreements regularly operate at transmission levels above those adopted herein.<sup>262</sup> If we were to amend our two-degree spacing policy so that a new entrant steps into the shoes of a prior occupant and operates at previously coordinated levels, existing operators would be assured of interference protections while new entrants could exceed the routine limits without further coordination. We expect to continue our review of the two-degree spacing policy going forward, and we plan to seek comment on such an approach and other alternatives to address this concern in a future Notice of Proposed Rulemaking.

### 3. Continuation of Non-Routine Operations

105. *Background.* In the *Further Notice*, we recognized that a GSO FSS space station operator could provide valuable service to users with small, non-two-degree compliant earth station antennas that is nonetheless compatible with operation of existing co-frequency, co-coverage satellites.<sup>263</sup> Under our current rules, however, such an operator might have to cease providing the service if transmissions from the non-routine earth stations interfered with the uplink reception of a subsequently authorized, adjacent space station, or if interference from the new space station's transmissions impaired the non-routine earth stations' downlink reception. For this situation, we requested comment on whether the Commission should, instead, require a new entrant to coordinate co-frequency, co-coverage operation with a U.S.-licensed operator that has been providing non-two-degree-compliant GSO FSS services without causing unacceptable interference, consistently with any previous coordination required by the ITU Radio Regulations and Commission rules or policies.<sup>264</sup> In the event that we adopted such a policy, we sought comment on whether coordination priority and protection rights between U.S. licensees, or operators with U.S. market access, should be based on ITU filing priority, as Intelsat recommends in comments on the *Process Reform Report*,<sup>265</sup> or based on FCC application filing dates. We also requested comment on whether we should require prior notification to the Commission of the details of non-routine operation in a specific frequency range and coverage area as a prerequisite for protection of such operation from harmful interference from operation of subsequently authorized satellite systems.

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<sup>260</sup> See SES Comments at 5 ("[T]he Commission's typical conditions for both U.S. satellite licensees and foreign-licensed operators granted U.S. market access require compliance with the two-degree spacing parameters unless higher levels have been coordinated with adjacent satellites. This even-handed application of Commission rules is consistent with the Commission's obligations pursuant to international trade agreements[.]").

<sup>261</sup> Letter from Ryuji Sasaki, President & COO, JSAT International Inc., to Marlene H. Dortch, Secretary, FCC, at 1 (filed Dec. 8, 2015).

<sup>262</sup> Letter from Karis A. Hastings, Counsel for SES, to Marlene H. Dortch, Secretary, FCC, Attach. at 1-2 (filed Dec. 9, 2015) (listing EIRP densities for C-band and Ku-band satellites operating from 67° to 139° W.L.).

<sup>263</sup> *Further Notice*, 29 FCC Rcd at 12133, ¶¶ 45-46.

<sup>264</sup> *Id.*, 29 FCC Rcd at 12133, ¶ 47.

<sup>265</sup> Intelsat Comments in Docket 14-25 at 5-7.

106. *Discussion.* Most commenters that address this issue support providing greater certainty to space station operators that they may continue to perform coordinated, non-routine operations upon the arrival of an adjacent, two-degree-compliant space station.<sup>266</sup> Intelsat advocates that, in the event the Commission retains a two-degree spacing framework, the Commission remove downlink power limits on GSO FSS transmission and instead require space station operators to attempt to coordinate their operations with adjacent co-frequency, co-coverage operations within six degrees of the operator's assigned orbital location.<sup>267</sup> Priority in such coordination, even solely between two U.S. licensees, would be based on each operator's ITU filing priority. Intelsat asserts that by aligning Commission and ITU coordination requirements, new entrants could no longer use default two-degree spacing rules to undermine the provision or continuity of non-routine service or to degrade the value of U.S. ITU filings.<sup>268</sup> DIRECTV, EchoStar, and SES agree that the Commission should permit a space station operator that has coordinated the use of parameters in excess of those allowed under the two-degree spacing policy with existing operators to continue to provide service at the coordinated levels upon the arrival of a later-authorized, two-degree compliant space station.<sup>269</sup> These parties, however, argue that a later-authorized space station that complies with two-degree spacing criteria should not be required to reduce its transmitting power below two-degree levels to protect the adjacent incumbent operations. Rather, DIRECTV, EchoStar, and SES suggest that in this instance, the existing, non-routine operations should accept any interference from later-authorized space station operations conforming to routine power levels. DIRECTV reasons that unless each Commission licensee may transmit at the levels permitted under the Commission's two-degree spacing requirements, the advantages of expeditious processing and reduced costs could be significantly reduced.<sup>270</sup> In contrast to these parties, ViaSat urges the Commission to continue to require non-routine operations to be curtailed to protect a subsequently launched system unless the subsequent system operator consents to the non-routine operations.<sup>271</sup> ViaSat asserts that the Commission should continue to protect new entrants in order to preserve opportunities for new systems in an increasingly congested GSO arc, and enable them to operate under the same basic interference environment afforded to other Commission licensees.

107. As a prerequisite to any continued non-routine operation in the face of a non-consenting new neighbor, DIRECTV, EchoStar, and SES support a requirement that the existing operator notify the Commission of the details of its non-routine operations in a manner to enable subsequent operators to assess the potential interference environment.<sup>272</sup> Intelsat, however, argues that such a notification is unnecessary and would burden Commission resources.<sup>273</sup>

108. We substantially adopt the proposal of DIRECTV, EchoStar, and SES to allow continued transmissions above routine levels upon notice to the Commission, even if such levels are not coordinated with later applicants and petitioners for market access. As noted in the *Further Notice* and observed by

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<sup>266</sup> See Intelsat Comments at 19-29, Appendix 1; DIRECTV Comments at 7; DIRECTV Reply at 5; EchoStar Reply at 8-9; SES Comments at 7-8; SES Reply at 6-7.

<sup>267</sup> Intelsat Comments at 27-29, Appendix 1.

<sup>268</sup> Intelsat also commented on the alternative text of Section 25.140 proposed in the *Further Notice* to afford greater protection to non-routine incumbent operations. Intelsat Comments at 24-26. Intelsat argues that revisions to the text are needed to accomplish the stated goal in the *Further Notice*. See *id.*; *Further Notice*, 29 FCC Rcd at 12133, ¶ 47.

<sup>269</sup> See DIRECTV Comments at 7; DIRECTV Reply at 5; EchoStar Reply at 8-9; SES Comments at 7-8; SES Reply at 6-7.

<sup>270</sup> DIRECTV Comments at 7.

<sup>271</sup> ViaSat Reply at 7-8.

<sup>272</sup> See DIRECTV Comments at 8; EchoStar Reply at 8-9; SES Comments at 8; SES Reply at 7 n.27.

<sup>273</sup> Intelsat Comments at 24 n.67.

commenters, space station operators may provide valuable service to users with very small earth station antennas that is not compatible with operation of co-frequency, co-coverage space stations separated by two degrees and transmitting at routine power density levels. Such non-routine operations may be performed without causing harmful interference to other users and in accordance with any coordination agreements required under ITU Radio Regulations and Commission rules or policies. If future operators are given adequate notice of such pre-existing, non-routine operation, we do not believe it serves the public interest to require the existing system to reduce transmit power density levels to protect a later-authorized, two-degree compliant operator, in a manner that may preclude continued provision of the service, in the event the two operators do not come to a successful coordination. Indeed, continuation of such existing operations would promote continuity of service and encourage capital investment. At the same time, we wish to preserve the benefits of expedited processing and reduced costs that accompany the policy of establishing routine transmission criteria for two-degree orbital spacing.

109. To accommodate this dual goal, we will modify the two-degree spacing policy as follows. An operator of a GSO FSS space station in the conventional or extended C-bands, conventional or extended Ku-bands, or conventional Ka-band may notify the Commission of its non-routine transmission levels and be relieved of the obligation to coordinate such levels with later applicants and petitioners for market access. The letter notification must include the downlink off-axis EIRP density levels or power flux density levels and/or uplink off-axis EIRP density levels, specified per frequency range and space station antenna beam, that exceed the relevant routine limits.<sup>274</sup> Once the International Bureau receives the notification, it will issue a public notice announcing the filing. Non-routine transmissions notified pursuant to this procedure need not be coordinated with operators of authorized co-frequency space stations that filed their complete applications or petitions for market access after the date of filing of the notification with the Commission.<sup>275</sup> Such later applicants and petitioners must accept any additional interference caused by the notified non-routine operations, but need not restrict their own transmissions below routine levels to afford greater protection to the incumbent.<sup>276</sup> This procedure will afford existing, non-routine operations a measure of certainty regarding future provision of the service, while preserving for new space station operation the application processing and competitive benefits of providing service at default transmission levels in these bands. In addition, to support continuity of service when non-routine operations are transferred to a replacement space station, we will permit the replacement to operate up to the notified transmission levels of the space station being replaced.

110. We recognize that this procedure does not ensure full protection for existing, non-routine operations, notably sensitive earth station receive operations, as generally proposed in the *Further Notice*. Defining appropriate criteria for the protection for such non-routine operations, however, is challenging, and detailed limits on adjacent operations could undercut the benefits of establishing default transmission levels for all space stations in these bands. Further, no specific proposal on how to define the necessary levels of protection has been presented in the record. For this reason, we refrain, at this time, from establishing greater protection rights for non-routine operations than can be negotiated through coordination. In any case, we expect that the procedure for continuation of non-routine transmissions we adopt here will encourage parties to reach coordination agreements that will preserve to the maximum extent possible the continuity of existing services. If difficulties arise that threaten to disrupt an established service, parties may always bring the matter to the Commission for assistance in finding a mutually satisfactory solution.

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<sup>274</sup> Under the two-degree certification requirement we adopt in Section IV.F.5. below, this information would not be provided to the Commission in a space station application.

<sup>275</sup> In the case of a space station license applicant that files its application without knowledge of a prior-filed notification of non-routine transmission, we will allow the applicant to withdraw its application and receive a refund of any fee paid, to avoid an unfairness that might otherwise arise in this regard.

<sup>276</sup> We codify this exception to the two-degree spacing policy in Sections 25.140(d) and 25.220(d)(2). See Appendix B, *infra*.

#### 4. Routine Criteria for Downlink Transmission

111. *Background.* In the *Further Notice*, we noted that the routine power density limits on space station downlink transmission in the conventional Ku-band and conventional Ka-band are found in rule provisions governing the licensing of earth stations.<sup>277</sup> We proposed to move these limits to a modified Section 25.140(a) as coordination triggers for space station applicants so that space station operators, not earth station operators, would bear ultimate responsibility for controlling the interference potential of downlink transmission. We also proposed to adopt routine limits on downlink transmission in the conventional and extended C-bands, which do not currently exist in our rules, and likewise to insert them as coordination triggers in Section 25.140(a).<sup>278</sup> Taking into account the capabilities of current C-band satellites and typical operational conditions, we proposed to specify a 1 dBW/4kHz coordination threshold for digital downlink transmission in the conventional or extended C-band and an 8 dBW/4kHz coordination threshold for analog downlink transmission in those bands. In addition, we proposed to apply the downlink criteria for conventional Ku-band transmission to the extended Ku-band as well.<sup>279</sup> Finally, because there is no EIRP density limit in the Commission's rules for analog video downlinks<sup>280</sup> and the number of satellites transmitting analog video signals is gradually diminishing, we did not propose to adopt technical criteria for routine licensing of analog video space station operation.<sup>281</sup>

112. *Discussion.* Parties addressing the issue generally support the Commission's proposed treatment of routine downlink criteria. DIRECTV and SES agree that the downlink limits currently specified in various earth station provisions should be relocated to Section 25.140 and treated as coordination triggers for space station applicants.<sup>282</sup> SES, however, argues that the specific power levels for digital carriers set forth in the proposed rules should be increased to align more closely with current satellite operating parameters.<sup>283</sup> Specifically, based on a review of the operating parameters of current space stations, SES recommends increasing the downlink EIRP density limit for digital transmission in both the conventional and extended Ku-bands from 10 dBW/4kHz to 13 dBW/4kHz. SES also recommends increasing the proposed downlink EIRP density limit for digital transmission in the conventional and extended C-bands from 1 dBW/4kHz to 3 dBW/4kHz. EchoStar supports SES's

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<sup>277</sup> See *Further Notice*, 29 FCC Rcd at 12134, 12143, ¶¶ 49, 79.

<sup>278</sup> *Id.*, 29 FCC Rcd at 12134, ¶ 50.

<sup>279</sup> See *id.*, 29 FCC Rcd at 12189-90, Appendix A, ¶ 19 (proposing text of Section 25.140(a)(3)(ii) including the "extended Ku-band").

<sup>280</sup> See *2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, Streamlining the Commission's Rules and Regulations for Satellite Applications and Licensing Procedures*, IB Docket No. 00-248, Eighth Report and Order and Order on Reconsideration, 23 FCC Rcd 15099, 15114-15, ¶¶ 30-32 (2008) (*Earth Station Eighth Report and Order*).

<sup>281</sup> *Further Notice*, 29 FCC Rcd at 12134, ¶ 52.

<sup>282</sup> See DIRECTV Comments at 7; SES Comments at 7.

<sup>283</sup> SES Comments at 6-7; see also Letter from Karis A. Hastings, Counsel for SES Americom, to Marlene H. Dortch, Secretary, FCC (filed July 21, 2015) (*SES Ex Parte*). As noted above, space station operators have deviated from the parameters assumed for purposes of a two-degree spacing interference analysis when permitted under the terms of subsequent coordination agreements. Based on its analysis of currently authorized space stations, SES concludes that 97% of the space station antenna beams reviewed in the conventional C-band, and all of the beams in the conventional Ku-band, would exceed the downlink EIRP density limits proposed in the *Further Notice*. *SES Ex Parte* at 2.



proposed downlink EIRP density values for both the conventional and extended Ku-band as better reflective of its own operations.<sup>284</sup>

113. Intelsat opposes any expansion of the two-degree spacing policy, including the specification of routine limits for uplink transmissions in the extended C-band, or routine limits for downlink transmissions in the conventional or extended C-bands, or the extended Ku-band.<sup>285</sup> DIRECTV opposes applying routine downlink criteria to the extended Ku-band.<sup>286</sup> DIRECTV argues that doing so could retroactively invalidate coordination arrangements in these bands between existing systems that do not comply with the two-degree parameters.

114. DIRECTV and Intelsat stress in particular that the Commission should not apply two-degree spacing limits to the portion of the extended Ku-band subject to an international plan under Appendix 30B of the ITU Radio Regulations.<sup>287</sup> They observe that under the Appendix 30B plan, frequency assignments are protected from harmful interference according to specific protection criteria and a methodology for determining the impact of proposed new systems on existing or previously proposed systems under the plan. DIRECTV and Intelsat argue that requiring space station operators in the Appendix 30B bands to accept interference from another U.S. licensee would erode protection against additional interference from future systems proposed by other Administrations.

115. We adopt our proposal to remove the routine limits on the power density of downlink transmission in the conventional Ku-band and conventional Ka-band from Sections 25.134, 25.138, and 25.212 and insert them in Section 25.140 as coordination triggers for space station applicants and licensees. In addition, we adopt SES's suggested increases for the proposed limits on digital transmissions in the conventional and extended C-bands and the conventional and extended Ku-bands, excluding in both cases the Appendix 30B planned bands. We agree with SES and EchoStar that these higher values are consistent with a two-degree spacing environment and should more closely align with the operational parameters of current satellite systems. In addition, we believe that applying routine downlink limits to the extended Ku-bands in which there are currently only routine uplink limits will further expedite application processing and reduce costs for applicants. To the extent that space station operators have negotiated coordination agreements for operation in the extended Ku-band at levels that exceed the routine limits we are adopting, such operation may continue as far as these coordination agreements remain in effect.

116. As DIRECTV and Intelsat note, however, the Appendix 30B frequency bands are subject to an international plan.<sup>288</sup> Under the protection criteria applicable to plan assignments in these bands, accepting additional interference from another U.S. licensee would effectively degrade the amount of protection available to the U.S. filing from harmful interference from operations of other Administrations.<sup>289</sup> Because of the specific international plan applicable to these frequencies, and to

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<sup>284</sup> EchoStar Reply at 13. *See also* EchoStar Comments at 31 (citing *Further Notice*, 29 FCC Rcd at 12132, ¶ 42) (stating that the two-degree spacing rules could be improved by “establishing a more complete set of baseline power levels for common FSS bands”).

<sup>285</sup> Intelsat Reply at 8-9; *see also Further Notice*, 29 FCC Rcd at 12146, ¶ 91 (proposing to extend the routine licensing criteria for conventional C-band earth stations in Section 25.218 to proposed earth station operations “in the ‘extended’ C-band uplink frequencies: that is, 5850-5925 MHz, 6425-6700 MHz, and 6700-7025 MHz”).

<sup>286</sup> DIRECTV Reply at 4.

<sup>287</sup> DIRECTV Reply at 4-5; Intelsat Reply at 8-9. These are the 10.70-10.95 GHz, 11.20-11.45 GHz, and 12.75-13.25 GHz frequency bands. The 4500-4800 MHz and 6725-7025 MHz bands in the extended C-band are also Appendix 30B frequency bands.

<sup>288</sup> *See* ITU Radio Regulations, Appendix 30B.

<sup>289</sup> *See id.*, Appendix 30B, Annex 4.

avoid harming U.S. filings under Appendix 30B, it is inappropriate to apply routine downlink criteria to these bands, either in the extended C-band or the extended Ku-band.

### 5. Certification of Two-Degree Compatibility

117. *Background.* The *Further Notice* also proposed to amend Section 25.140(a) to allow applicants for GSO FSS space stations to provide a certification of two-degree compatibility in lieu of an interference analysis demonstrating that the proposed system will be compatible with previously authorized space stations within two angular degrees of the proposed space station.<sup>290</sup> Under the proposal in the *Further Notice*, an applicant for a GSO FSS space station license at an orbital location less than two degrees from the assigned location of a co-frequency space station could either certify that its proposed operation has been coordinated with the operator of the co-frequency satellite or submit an interference analysis demonstrating the compatibility of the proposed system with the co-frequency satellite. An applicant for space station operation (other than analog video operation) in the conventional or extended C-band, the conventional or extended Ku-band, or the conventional Ka-band at a location two degrees or more from the nearest co-frequency U.S.-authorized satellite would not have to provide an interference analysis if it certifies that it will coordinate any uplink or downlink operation exceeding relevant routine limits with operators of co-frequency space stations within six degrees of its assigned orbital location that have been authorized by the U.S. or have been granted market access.

118. *Discussion.* DIRECTV, EchoStar, Intelsat, and SES support allowing two-degree certifications by space station applications in lieu of providing an interference analysis.<sup>291</sup> SES, however, requests that we revise the proposed Section 25.140(a)(3) to make clear that an applicant for a space station to be located two or more degrees away from the nearest co-frequency space station need not provide a certification that it will comply with routine downlink limits if higher levels are not appropriately coordinated if the applicant instead chooses to provide an interference analysis.<sup>292</sup> Iridium argues that any certifications for two-degree spacing purposes should not replace the requirement in Section 25.203(k)<sup>293</sup> that a GSO FSS earth station applicant in the 29.25-29.5 GHz band show either that it has coordinated with NGSO MSS feeder links or that it will not interfere with NGSO MSS feeder links.<sup>294</sup> In addition to the comments on two-degree spacing certifications, SIA proposes an analogous certification of four-degree compatibility for 17/24 GHz BSS space stations, in order to make this rule consistent with the certifications proposed for operation in a two-degree spacing environment.<sup>295</sup>

119. We adopt our proposal to require space station applicants to certify compliance with routine limits in lieu of providing a two-degree spacing interference analysis.<sup>296</sup> This action should reduce

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<sup>290</sup> *Further Notice*, 29 FCC Rcd at 12134, ¶ 51.

<sup>291</sup> See DIRECTV Comments at 7; EchoStar Comments at 31; Intelsat Comments at 21-22; SES Comments at 8-9.

<sup>292</sup> SES Comments at 8-9.

<sup>293</sup> Section 25.203(k) requires an applicant for an earth station, other than an Earth Station on Vessel (ESV), a Vehicle-Mounted Earth Station (VMES), or an Earth Station Aboard Aircraft (ESAA), that will operate in a frequency band shared by GSO systems and NGSO feeder links, to demonstrate that the proposed operation will not cause unacceptable interference to any satellite system licensed for operation in the same band or else certify that the proposed operation will conform to established coordination agreements with the licensees of the affected satellite systems. 47 C.F.R. § 25.203(k).

<sup>294</sup> Iridium Reply at 4.

<sup>295</sup> SIA Reply, Exhibit 3 at 42-43.

<sup>296</sup> In contrast with the milestone certification requirements we declined to adopt above, we believe that we can rely on a certification regime for compliance with two-degree spacing requirements because self-interested operators receiving interference will have an incentive to report an operator not complying with its certification, and because compliance with a coordination agreement or routine operating limits is generally more straightforward than a determination of completion of a milestone under our precedent.

administrative burdens on both applicants and the Commission. Thus, for operation in the covered frequency bands, other than analog video operation, at a location two degrees or more from the nearest co-frequency space station, GSO FSS space station applicants will be required to provide a certification that both downlink and uplink operations will not exceed applicable routine limits unless the non-routine uplink and/or downlink operation is coordinated with operators of authorized space stations within six degrees of their assigned orbital location. We decline SES's proposal to accept an interference analysis in place of this initial certification. In case difficulties arise during the required coordination, a space station grantee that intends to operate in excess of routine limits may still submit an analysis demonstrating that the proposed operation will not cause harmful interference to a non-consenting operator and request that the Commission permit the non-routine operations. Finally, we agree with Iridium. Accordingly, the requirement for space station applicants to provide a certification of two-degree spacing compatibility does not replace the sharing demonstration or certification required from earth station applicants by Section 25.203(k).

120. We also adopt SIA's proposal to require applicants for operation of 17/24 GHz BSS space stations to certify compatibility with the four-degree spacing environment for that service.<sup>297</sup> This certification, based on the downlink PFD limits in Section 25.208(w) and uplink EIRP density limits in Section 25.223(c), similarly will provide additional flexibility to operators and reduce administrative burdens on applicants and the Commission.

## 6. Geographic Scope

121. *Background.* In the event that the Commission does not eliminate the two-degree spacing policy entirely, Intelsat requests that we confine application of the policy to beams, or a collection of beams from a single satellite, that serve the entire contiguous United States (CONUS).<sup>298</sup> Intelsat asserts that the Commission's competitive basis for the two-degree spacing policy does not extend to beams serving areas outside CONUS, where Intelsat asserts that the two-degree spacing policy serves as a "handicap" to U.S. licensees by potentially constraining operations.

122. *Discussion.* We will not limit the applicability of the two-degree spacing rules to beams that cover, alone or collectively on the same satellite, all of CONUS. As an initial matter, and as we noted above, the two-degree spacing rules apply only to those non-U.S. licensed space station operations that fall within the scope of a grant of U.S. market access under the Commission's *DISCO II* policy.<sup>299</sup> Thus, transmissions between non-U.S. licensed space stations and non-U.S. earth stations are not subject to the policy, and U.S.-licensed operators and applicants need not take these operations into account for purposes of a two-degree spacing analysis or certification. For two U.S.-licensed space stations, however, the default two-degree spacing rules apply to operations anywhere in the world. We believe that the benefits of expedited processing and reduced costs for U.S. applicants that are created by the policy also

<sup>297</sup> Adoption of this four-degree certification requirement is a logical outgrowth of the proposed two-degree certification requirements in the *Further Notice*, given the sets of routine operating parameters for both two-degree and four-degree spacing and the similar considerations and benefits for the two types of certifications. See *Further Notice*, 29 FCC Rcd at 12134, ¶ 51. Moreover, the certification of compliance with Section 25.223(c) is functionally equivalent to the certification of compliance with Section 25.138(a) for conventional Ka-band operations, as both of these Sections contain essentially identical power density envelopes.

<sup>298</sup> Intelsat Reply at 8.

<sup>299</sup> See *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations To Provide Domestic and International Satellite Service in the United States*, IB Docket No. 96-111, Report and Order, 12 FCC Rcd 24094 (1997) (*DISCO II*); see also, e.g., *DIRECTV Enterprises, LLC, Application for Authorization to Launch and Operate DIRECTV KU-45W*, Order and Authorization, 30 FCC Rcd 1790, 1793, ¶ 9 (Int'l Bur., Sat. Div. 2015); *Intelsat License LLC, Application for Modification of the Intelsat 5 Authorization to Specify Operation at the 157° E.L. Orbital Location, Application for Modification of the Intelsat 5 Authorization to Extend the License Term for the Space Station*, Order and Authorization, 30 FCC Rcd 2703, 2706, ¶¶ 8-9 (Int'l Bur., Sat. Div. 2015). The acronym "DISCO" stands for Domestic-International Satellite Consolidation Order.

apply to proposed non-U.S. licensed operations with any U.S.-licensed earth station. Intelsat does not suggest otherwise. Nor has Intelsat provided a meaningful policy justification on which to distinguish space station beams that serve all of CONUS from those that serve almost all of CONUS. Accordingly, we decline to constrain the policy to full-CONUS satellites.

**G. The First-Come, First-Served Procedure for GSO-Like Satellite Operation**

123. *Background.* In 2003, the Commission adopted a first-come, first-served application procedure for “GSO-like” space station operation, *i.e.* that operation designed for communication with earth stations with directional antennas.<sup>300</sup> Under this procedure, the Commission places applications for new U.S.-licensed space station operation, and requests for new U.S. market access via non-U.S. licensed space station operation, in a single processing “queue” in the order in which they are filed.<sup>301</sup> The Commission will grant the first-in-line application if the operation it proposes is compatible with authorized space station operations and the applicant is otherwise qualified and will dismiss later-filed space station applications that are incompatible with the newly authorized space station operation.<sup>302</sup> In the event that a license or market access grant is revoked, the Commission will begin accepting new applications for use of the resources as of the time of adoption of the Order revoking the grant.<sup>303</sup> In the event that a licensee or market access recipient surrenders all or part of its space station grant, the Commission will release a public notice announcing the surrender to notify potential applicants of the availability of the spectrum and orbital resources. Current practice is to begin accepting applications that would have been mutually exclusive with the surrendered authorization on the Tuesday following the Friday weekly notice that announces the surrender. In the *Further Notice*, as part of our comprehensive review of Part 25, we sought comment on whether any modifications of the first-come, first-served procedure might be appropriate.<sup>304</sup>

124. *Discussion.* SIA and EchoStar support retention of the first-come, first-served application procedure.<sup>305</sup> To aid potential applicants under this procedure, EchoStar suggests that the Commission issue regular public notices listing the orbital locations and frequencies available for assignment to commercial applicants, as well as those reserved for use by the Federal government.<sup>306</sup> DIRECTV supports this proposal.<sup>307</sup> Similarly, Inmarsat requests that the International Bureau publish on its website a summary of the orbital locations, frequencies, polarization, and coverage of space stations currently authorized by the Commission.<sup>308</sup>

125. Inmarsat also argues that applicants for surrendered spectrum and orbital assignments should be afforded more time, such as 45 days, before the Commission begins accepting new applications for the “recovered” resources.<sup>309</sup> Intelsat supports this proposal.<sup>310</sup> Additionally, Inmarsat suggests that

<sup>300</sup> See 47 C.F.R. § 25.158(a), (b); *Space Station Licensing Reform Order*, 18 FCC Rcd at 10792-822, ¶¶ 71-159.

<sup>301</sup> See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10805, ¶ 109.

<sup>302</sup> See *id.*, 18 FCC Rcd at 10805, ¶ 110; 47 C.F.R. § 25.155(a).

<sup>303</sup> See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10806, ¶ 113.

<sup>304</sup> *Further Notice*, 29 FCC Rcd at 12135, ¶ 53.

<sup>305</sup> SIA Comments at 6; EchoStar Comments at 31.

<sup>306</sup> EchoStar Comments at 31-32. EchoStar notes that information on orbital locations and frequencies that the National Telecommunications and Information Administration (NTIA) has authorized for Federal users is currently found in two public notices. See *id.* (citing *Policy Branch Information, Actions Taken*, Public Notice, 28 FCC Rcd 2553 (rel. Mar. 15, 2013); *Ka-Band Licenses Surrendered; Current List of Orbital Locations Not Available for Licensing in Portions of the Ka-Band*, Public Notice, Report No. SPB-208 (rel. July 23, 2004)).

<sup>307</sup> DIRECTV Reply at 7-8.

<sup>308</sup> Inmarsat Comments at 8; see also *Process Reform Report* at 66, Recommendation 5.11.

<sup>309</sup> Inmarsat Comments at 4.

such “recovered” resources be made available at periodic intervals—such as once a quarter—rather than as each individual authorization is surrendered. Inmarsat asserts that the Commission’s current practice of making spectrum and orbital locations available for reassignment five days after the announcement of their surrender makes it difficult for potential applicants to anticipate when the resources will become available and prepare for the opening of the application period.

126. Finally, Inmarsat argues that the Commission should grant later-filed, mutually exclusive space station applications to provide satellite operators greater flexibility while they consider different orbital locations for a planned satellite network.<sup>311</sup> Inmarsat states that such later-granted authorizations could be secondary to earlier authorizations for the same spectrum and orbital resources and still subject to all applicable Commission requirements. DIRECTV opposes this proposal, which it asserts could create opportunities for regulatory gamesmanship among multiple, incompatible space station grantees.<sup>312</sup>

127. We agree that the public interest would be served by providing easier access on our website to information about current Commission space station authorizations. At present, a list of space station licenses and grants of U.S. market access through Letters of Intent and Petitions for Declaratory Ruling<sup>313</sup> may be generated on the International Bureau Filing System (IBFS) website.<sup>314</sup> This list includes information on assigned frequency bands and orbital locations of GSO space stations. In order to assess the compatibility of potential GSO-like space station operations with existing authorizations, however, a prospective applicant must also know the authorized coverage areas and emission polarization(s). In this regard, a given frequency band and nominal orbital location are not “unavailable” to an applicant solely because they are authorized to another Commission licensee. Rather, the two systems may be compatible if their coverage areas do not overlap or if they operate on opposite polarizations. While polarization and coverage information is publicly available in IBFS in the relevant application materials, we agree with Inmarsat that including this information in an online list of current authorizations would aid potential applicants. Further, we believe that maintaining a single master list of all current authorizations on our website will prove more convenient to the public and the Commission than managing separate online lists for space stations included on the Permitted Space Station List<sup>315</sup> or ISAT List<sup>316</sup> or otherwise granted market access.<sup>317</sup> Accordingly, we will create and maintain on our website a list of all regular Commission space station licenses and grants of U.S. market access, including information on the frequencies and polarization(s) used, coverage area provided, and orbital location of

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<sup>310</sup> Intelsat Reply at 13.

<sup>311</sup> See Inmarsat Comments at 3-4.

<sup>312</sup> DIRECTV Reply at 2.

<sup>313</sup> The Commission grants access to the U.S. market for non-U.S. licensed space station operation through Letters of Intent and Petitions for Declaratory Ruling filed by the space station operator, as well as through earth station applications to access the foreign satellite. Grants of market access through earth station applications are not included in the International Bureau Filing System list of current space station authorizations, but may be found on a separate Commission webpage collecting space station market access information. See Space Stations Approved for U.S. Market Access, available at [http://www2.fcc.gov/ib/sd/se/market\\_access.html](http://www2.fcc.gov/ib/sd/se/market_access.html).

<sup>314</sup> See, for example, the link to Satellite Space Stations – Current Authorizations by Licensee on the Advanced IBFS Search webpage, available at <http://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/reports/swr030b.hts?set>.

<sup>315</sup> See *Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, First Order on Reconsideration, IB Docket No. 96-111, 15 FCC Rcd 7207, 7216, ¶ 19 (1999) (*Permitted List Order*); see also generally *Ka-band Permitted List Order*, 25 FCC Rcd at 1547-48, ¶ 12.

<sup>316</sup> See *Inmarsat, Inc. Request to Streamline Licensing of L-band Mobile-Satellite Service Terminals Using Inmarsat Satellites as Points of Communication*, Order, 23 FCC Rcd 15268, 15270, ¶ 8 (Int’l Bur., Sat. Div. 2008).

<sup>317</sup> See *Removal of Approved Non-U.S.-Licensed Space Stations from the Section 214 Exclusion List*, Order, 26 FCC Rcd 9423, 9426, ¶ 7 (Int’l Bur. 2011).



GSO satellites, and indicating which space station operations are accessible to earth stations by virtue of a “Permitted List” or “ISAT List” designation on their license.<sup>318</sup>

128. Because we are creating an online list with detailed information about all current space station authorizations, we decline EchoStar’s proposal to issue periodic public notices indicating which orbital locations and frequency bands are “available” for applications with the Commission. As noted in the preceding paragraph, the Commission may grant licenses to unaffiliated applicants for two space stations at the same nominal orbital location and using the same frequency bands if the operations they propose are compatible with one another, for example by utilizing opposite polarizations or covering different geographic areas. Detailing the breadth of operations compatible with present authorizations, therefore, would be unduly complicated. Instead, we believe that the online list of all current authorizations will serve the informative function sought by EchoStar in a more efficient and timely manner.

129. We also will not delay consideration of new applications following the surrender of a conflicting space station grant. Today, we adopt a two-step application process through which space station applicants may enter the queue by submitting API and Coordination Request materials along with an application-stage bond.<sup>319</sup> These materials require significantly less information and preparation time than a complete license application. Moreover, a goal of adopting this procedure is to allow applicants to begin the licensing process early in the development of a satellite network so that they may establish an earlier protection date for the ITU filings relied upon. We do not wish to undercut this goal by delaying acceptance of such limited initial application materials, and their submission to the ITU, by 45 days or by making surrendered resources available only on a quarterly basis.

130. Finally, we decline Inmarsat’s suggestion to allow for grant of multiple conflicting space station authorizations, with those granted later being “secondary” to the earlier authorizations. In 2003, the Commission decided against keeping subsequently filed applications on file after it grants a conflicting authorization.<sup>320</sup> The Commission concluded that keeping applications on file would encourage speculative or “place holder” applications and would not result in faster service to the public. Similarly, we believe that Inmarsat’s proposal would encourage tiers of “place holder” authorizations that would complicate space station licensing and may not result in faster service to the public.

#### **H. Codification of Processing Policy for Replacement Satellite Applications**

131. The Commission has generally granted applications by GSO satellite operators for authority to launch and operate replacement satellites<sup>321</sup> and “emergency” replacement satellites<sup>322</sup> without considering competing applications.<sup>323</sup> We proposed to codify the existing processing policy for

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<sup>318</sup> We will also include on this webpage links to relevant information concerning NTIA-authorized Federal space stations.

<sup>319</sup> See Section IV.A., *supra*.

<sup>320</sup> *Space Station Licensing Reform Order*, 18 FCC Rcd at 10806, ¶ 113.

<sup>321</sup> See, e.g., *Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 3 FCC Rcd 6972, 6973, ¶ 8 n.31 (1988); *Space Station Licensing Reform Order*, 18 FCC Rcd at 10854-55, ¶ 250; see also 47 C.F.R. § 25.165(a), (e) (exempting replacement satellite licenses from the bond-posting requirement).

<sup>322</sup> See, e.g., *Hughes Communications Galaxy, Inc. Application for Authority to Construct, Launch and Operate an Emergency Replacement Satellite*, Memorandum Opinion, Order and Authorization, 8 FCC Rcd 5089 (1993); see also Appendix B, *infra* (Section 25.113(g)(3)).

<sup>323</sup> NGSO authorizations generally include the authority necessary to launch, operate, and maintain the authorized system until the end of the license term, including authority for any replacement satellites necessitated by launch or operational failure or by retirement of satellites prior to the end of the license period. Replacement satellites

(continued....)

replacement satellite applications in Sections 25.156, 25.157, and 25.158, and to make other clarifying changes to those Sections.<sup>324</sup> EchoStar and DIRECTV support codifying these policies.<sup>325</sup> We adopt our proposals as described in the *Further Notice*,<sup>326</sup> which should make our existing application processing policies clearer.

### I. Time Periods for Application Processing

132. In comments on FCC Process Reform and in a written *ex parte* presentation in this proceeding, SIA recommends that the Commission establish informal guidelines on the time needed to process “straightforward” space station and earth station applications.<sup>327</sup> Specifically, SIA recommends that, for space station applications that are not contested: (1) applications for initial space station authorization be placed on public notice within 45 days of receipt, and acted upon within 45 days after close of the comment period; (2) applications for modification of a space station authorization be placed on public notice within 14 days of receipt, and acted upon within 30 days after close of the comment period; and (3) applications for special temporary authority (STA) for a space station be placed on public notice within 10 days of receipt, if public notice is required, and acted upon within 14 days after close of the comment period. For space-station STA requests that do not require public notice, SIA suggests a guideline of Commission action within 30 days of receipt.

133. We agree with SIA that providing applicants and the public with our expected processing times for typical applications will make our authorization process more transparent and predictable. Regarding SIA’s specific timeframes, however, we note two important considerations. First, the issues raised in a space station license modification application can be as complex as those raised in an application for initial authorization. Second, we often have to coordinate action among multiple Bureaus and Offices within the Commission and with other Federal agencies, for example when the proposed operation may impact terrestrial services or U.S. Government operations.<sup>328</sup>

134. In light of these considerations, we note the following expected processing periods for straightforward applications that are not contested, barring any complication: (1) applications for initial space station authorization or for modification of authorization will be placed on public notice within 45 days of receipt, and acted upon within 60 days after close of the comment period; and (2) applications for special temporary authority (STA) for a space station will be placed on public notice within 14 days of receipt, if public notice is required, and acted upon within 30 days after close of the comment period. For space-station STA requests that do not require public notice, we expect to act within 30 days of receipt.

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authorized under a blanket NGSO license are technically identical to those in service, including the same frequency bands and orbital parameters, and may not cause a net increase in the number of operating satellites in the authorized orbital planes or an additional orbital plane. *Space Station Licensing Reform Order*, 18 FCC Rcd at 10854, ¶ 250 n.596; see also Appendix B, *infra* (Section 25.113(i)). For NGSO replacement constellations, application-timing requirements are set forth in 47 C.F.R. § 25.121(e).

<sup>324</sup> *Further Notice*, 29 FCC Rcd at 12135, ¶ 54.

<sup>325</sup> EchoStar Comments at 32; DIRECTV Reply at 8. EchoStar also supports our proposed clarifying amendments. EchoStar Comments at 33.

<sup>326</sup> See *Further Notice*, 29 FCC Rcd at 12135, ¶ 54.

<sup>327</sup> Letter from Tom Stroup, President, SIA to Marlene H. Dortch, Secretary, FCC (filed Sept. 10, 2015) (attaching earlier filing on FCC Process Reform).

<sup>328</sup> For example, pursuant to a January 31, 2003, Memorandum of Understanding between the Commission and the National Telecommunications and Information Administration (NTIA), the Commission has agreed that, where possible, it will give advance notice of 15 business days to the NTIA before any action that could potentially cause interference to government operations. *Memorandum of Understanding between the Federal Communications Commission and the National Telecommunications and Information Administration* at 2, Section IV.3. (Jan. 31, 2003), available at [http://www.ntia.doc.gov/files/ntia/publications/fccntiamou\\_01312003.pdf](http://www.ntia.doc.gov/files/ntia/publications/fccntiamou_01312003.pdf).

135. SIA also argues that comparable timeframes should be established for earth station applications, but does not propose specific guidelines. We agree that earth station applicants would similarly benefit from disclosure of processing time expectations, and will pursue specific guidelines within the next six months.

**J. Licensing Rules for Earth Stations that Transmit to GSO Space Stations in FSS Frequency Bands**

136. In this Section we amend the Part 25 rules governing earth stations eligible for “routine” application processing to serve more effectively the general purpose of preventing harmful interference.

**1. Background**

137. Various Sections in Part 25 specify technical criteria for “routine licensing” or “routine processing” of fixed earth stations that transmit to GSO space stations in the “conventional” C-band (5925-6425 MHz), the “conventional” Ku-band (14.0-14.5 GHz), the “extended” Ku-band (12.75-13.25 GHz and 13.75-14.0 GHz),<sup>329</sup> the conventional Ka-band (28.35-28.6 GHz and 29.25-30.0 GHz), or the 24.75-25.25 GHz band, which is allocated for feeder-link transmissions for 17/24 GHz BSS systems.<sup>330</sup> Other rule Sections specify routine licensing criteria for earth stations that transmit from ships to GSO space stations in the conventional C-band or conventional Ku-band or from land vehicles or aircraft to GSO space stations in the conventional Ku-band.<sup>331</sup> These criteria were devised to limit the amounts of radiofrequency energy that such earth stations may radiate in directions other than toward the space stations they communicate with, absent coordination with operators of other space stations. Earth station applicants proposing conventional C-band, conventional or “extended” Ku-band, conventional Ka-band, or 24.75-25.25 GHz uplink operation not meeting routine licensing criteria must demonstrate that the proposed non-routine operation is permissible under the terms of coordination agreements between the operator(s) of the target satellite(s) and operators of other GSO space stations receiving in the same uplink band at orbital locations within six degrees of the target satellite(s).

138. To be eligible for routine licensing, applications for fixed earth stations transmitting to GSO satellites in the extended Ku-band or the conventional Ka-band and applications for earth stations transmitting from mobile platforms in the conventional C-band or conventional Ku-band must demonstrate that the proposed earth stations will operate within limits on off-axis equivalent isotropically radiated power (EIRP) density specified in Sections 25.138, 25.218, 25.221, 25.222, 25.226, and 25.227. Applicants for licenses for fixed earth stations transmitting in the conventional C-band or conventional Ku-band (except stations that transmit analog video signals)<sup>332</sup> can qualify for routine licensing either by demonstrating compliance with off-axis EIRP density criteria in Section 25.218 or by demonstrating compliance with antenna-size, off-axis gain, and input power density criteria in Section 25.134 or Section 25.212(c) or (d). Likewise, an applicant for a feeder-link earth station transmitting in the 24.75-25.25 GHz band can qualify for routine licensing either by demonstrating compliance with off-axis EIRP density criteria in Section 25.223 or by demonstrating compliance with the off-axis gain and input power density criteria in Section 25.212(f).

139. The input power-density and off-axis gain criteria in Sections 25.134 and 25.212 dovetail with the off-axis EIRP density criteria in Sections 25.218 and 25.223. Since off-axis EIRP density is a function of input power density and off-axis antenna gain, proposed earth stations that are ineligible for

<sup>329</sup> In this Second Report and Order, we redefine the term “extended Ku-band,” as used in Part 25, to include in the uplink only the 13.75-14.0 GHz band.

<sup>330</sup> See 47 C.F.R. §§ 25.134, 25.138, 25.211, 25.212, 25.218, 25.223.

<sup>331</sup> See 47 C.F.R. §§ 25.221, 25.222, 25.226, 25.227.

<sup>332</sup> There are different criteria in Section 25.211 for routine licensing of earth stations that transmit full-transponder analog video signals, which cannot be licensed under Section 25.218.

routine licensing under Section 25.134 or Section 25.212 because off-axis antenna gain would exceed relevant routine limits may qualify for routine licensing under Section 25.218 or Section 25.223 if input power density is reduced to compensate for the higher off-axis gain. Conversely, proposed earth stations could operate with higher input power density than the relevant level specified in Section 25.134 or 25.212 yet qualify for routine licensing under Section 25.218 or Section 25.223 if the applicants propose to use transmitting antennas with off-axis gain below the routine levels in Section 25.209 cross-referenced in Sections 25.134 and 25.212 to an extent sufficient to compensate for the higher input power density.

## 2. Definition of “theta”

140. *Background.* The rules that prescribe EIRP density criteria for routine licensing specify limits on EIRP density for various angular ranges. The angles are expressed in degrees, using the Greek letter theta ( $\theta$ ) to represent the angle. In the *Further Notice*, we observed that theta is defined in Sections 25.138 and 25.223 as the angle between a given direction of emission and the axis of a transmitting antenna’s main lobe—that is, the angle from the direction of peak emission—while Sections 25.218, 25.221, 25.222, 25.226, and 25.227 define theta as the angle from a line from the antenna’s focal point to the target satellite.<sup>333</sup> We proposed to amend Sections 25.138 and 25.223 to use the latter definition, because it properly places responsibility for the effects of antenna mis-pointing on applicants and licensees.<sup>334</sup>

141. *Discussion.* SIA and EchoStar commented on our proposal. SIA agrees that a single definition of theta is desirable in these rule Sections, but prefers to exclude the effects of antenna mis-pointing by specifying theta as an angle from the axis of the main lobe.<sup>335</sup> SIA argues that issues arising from antenna mis-pointing may be properly handled operationally between licensees, and that it is unclear how an applicant would demonstrate compliance with a given pointing accuracy. EchoStar also supports a definition of theta as the angle from the direction of greatest emission, and argues that reference to “the antenna’s focal point” in the description of the proposed definition would exclude antennas that do not make use of a parabolic reflector.<sup>336</sup> Finally, SIA suggests that a separate Greek letter phi ( $\phi$ ) be used when specifying the off-axis angle for the plane perpendicular to the GSO arc.<sup>337</sup> SIA argues that using phi instead of theta in this instance would more clearly indicate the two separate angular measurements.

142. Upon consideration of the record, we adopt our proposal to define theta in Sections 25.138 and 25.223 as the angle in degrees from a line from the earth station antenna to the orbital location of the target satellite.<sup>338</sup> We define theta in the same way in Sections 25.209, 25.218, 25.221, 25.222, 25.226, and 25.227,<sup>339</sup> and make other conforming changes to reflect this definition.<sup>340</sup> Taking account of

<sup>333</sup> *Further Notice*, 29 FCC Rcd at 12137, ¶ 59.

<sup>334</sup> *Id.*; see *Earth Station Eighth Report and Order*, 23 FCC Rcd at 15112, ¶ 24 n.90.

<sup>335</sup> SIA Comments at 7.

<sup>336</sup> EchoStar Comments at 33.

<sup>337</sup> See SIA Comments at 7-8.

<sup>338</sup> See, e.g., *Further Notice*, 29 FCC Rcd at 12213, Appendix A (proposing definition of theta in Section 25.223(b)(1)).

<sup>339</sup> See proposed definitions of theta in *Further Notice*, 29 FCC Rcd at 12199 (Section 25.209(a)(1)), 12203 (Section 25.218(c)(1)), 12207 (Section 25.221(a)(1)(i)(A)), 12210 (Section 25.222(a)(1)(i)(A)), 12215 (Section 25.226(a)(1)(i)(A)), 12218 (Section 25.227(a)(1)(i)(A)). The definition of theta in Section 25.209 proposed in the *Further Notice* references a line “from the focal point of the antenna.” See *Further Notice*, 29 FCC Rcd at 12199. As a logical outgrowth of our proposed definitions of theta in Sections 25.138, 25.218, 25.221, 25.222, 25.223, 25.226, and 25.227, and to reflect antenna designs that do not make use of a parabolic reflector, we omit the phrase “focal point” from the definition of theta in Section 25.209 and otherwise reconcile it with the definitions we are adopting in similar rule Sections.

potential earth station mis-pointing in the definition of theta better serves the Commission's goal of prescribing default limits on interference to adjacent co-frequency space stations. It also provides operators of adjacent space stations a basis for objection if they experience greater interference than expected due to antenna mis-pointing. Accordingly, we decline to adopt SIA's proposed definition of theta, which could deprive operators of this recourse to the Commission. Moreover, we have not found that administration of the current definition of theta in Sections 25.218, 25.221, 25.222, 25.226, and 25.227, which takes into account antenna pointing accuracy, results in uncertain compliance requirements. Finally, we decline SIA's suggestion to add an additional Greek letter phi to our rules prescribing off-axis EIRP density limits. We believe that use of the single term theta, as defined herein, is simpler and clear.

### 3. "Plane Tangent to the GSO Arc"

143. *Background.* Sections 25.218, 25.221, 25.222, 25.226, and 25.227 specify EIRP density limits for co-polarized signals in "the plane of the geostationary satellite orbit as it appears at the particular earth station location."<sup>341</sup> In the *Further Notice*, we proposed to replace this phrase and its definitions and shorthand variants with a new term, "plane tangent to the GSO arc," and to define the term in Section 25.103.<sup>342</sup>

144. *Discussion.* SIA suggests that we use the term "local plane of the GSO arc" in place of "plane tangent to the GSO arc," but otherwise supports our proposal and the proposed definition.<sup>343</sup> Because the plane being defined is tangent to the GSO arc at the location of the target space station, we believe that the term "plane tangent to the GSO arc" more clearly represents the definition we are adopting than SIA's suggestion. Accordingly, we adopt our proposal to define this term as "the plane defined by the location of an earth station's transmitting antenna and a line in the equatorial plane that is tangent to the GSO arc at the location of the GSO space station that the earth station is communicating with," for the reasons stated in the *Further Notice*.

### 4. Emissions Outside the Plane Tangent to the GSO Arc

145. *Background.* In the *Further Notice*,<sup>344</sup> we observed that routine EIRP density envelopes in Sections 25.138(a), 25.218, 25.223(b), 25.221(a), 25.222(a), 25.226(a), and 25.227(a) specify emissions in planes other than two orthogonal planes. In contrast, earth station antenna gain is required to be measured in only two orthogonal planes. We proposed to revise these EIRP density limits to apply likewise only to emissions in two planes: the plane tangent to the GSO arc and "the plane perpendicular to the GSO arc," a term that we proposed to define in Section 25.103.

146. *Discussion.* SIA supports our proposal, with a change in the term "plane perpendicular to the GSO arc" to "plane orthogonal to local plane of the GSO arc" in light of its proposed renaming of the "plane tangent to the GSO arc."<sup>345</sup> We have declined, however, to adopt SIA's proposed term for the "plane tangent to the GSO arc." We also prefer the common word "perpendicular" to "orthogonal," which has the same meaning in this instance. Accordingly, we adopt our proposal to define this term as

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<sup>340</sup> We amend provisions in Sections 25.138, 25.209, 25.218, 25.221, 25.222, 25.223, 25.226, and 25.227 to conform them to the definition of theta adopted in those rule Sections. Conforming amendments are also necessary in other rules. See Appendix B, *infra* (definitions of "plane perpendicular to the GSO arc" and "plane tangent to the GSO arc" in Section 25.103; description of "off-axis angle" in Section 25.115(g)(1)).

<sup>341</sup> See 47 C.F.R. §§ 25.218(c)-(h), 25.221(a)(1)(i)(A), 25.222(a)(1)(i)(A), 25.226(a)(1)(i)(A), 25.227(a)(1)(i)(A).

<sup>342</sup> See *Further Notice*, 29 FCC Rcd at 12137, ¶ 60.

<sup>343</sup> SIA Comments at 8.

<sup>344</sup> See *Further Notice*, 29 FCC Rcd at 12137, ¶ 61.

<sup>345</sup> SIA Comments at 8.



the plane that is perpendicular to the “plane tangent to the GSO arc,” as defined above, and includes a line between the earth station in question and the GSO space station that it is communicating with, for the reasons stated in the *Further Notice*.

## 5. Sidelobe and Backlobe Allowances

147. *Background.* The technical criteria for earth station licensing allow for variations in excess of the antenna gain envelopes in Section 25.209 and the EIRP density envelopes in Sections 25.138, 25.218, 25.221, 25.222, 25.223, 25.226, and 25.227. The *Further Notice* reviewed these allowances and proposed several amendments to rationalize the requirements.

148. For emissions “in the plane of the GSO” in the conventional C-band, conventional Ku-band, or “extended Ku-band.”<sup>346</sup> Sections 25.218(c)-(h), 25.221(a)(1)(i)(A), 25.222(a)(1)(i)(A), 25.226(a)(1)(i)(A), and 25.227(a)(1)(i)(A) provide that EIRP density may exceed the routine envelopes by as much as 3 dB in up to 10% of the sidelobes at theta angles between 7° and 180°. Section 25.209(a)(1) contains equivalent text specifying the sidelobe allowance for off-axis gain for antennas transmitting in bands other than the conventional Ku-band or conventional Ka-band. Because the angular width of an antenna’s sidelobes can vary, allowing 10% of the sidelobes to exceed an envelope at off-axis angles from 7° to 180° might allow the envelope to be exceeded in significantly more, or significantly less, than 10% of that angular range. We proposed to amend these rules to provide, instead, that the envelopes for off-axis EIRP density and antenna gain in the plane tangent to the GSO arc may be exceeded by as much as 3 dB in up to 10% of the theta angular range of 7-180°.<sup>347</sup>

149. For emissions outside “the plane of the GSO” in the conventional C-band, conventional Ku-band, or extended Ku-band, Sections 25.218(c)-(h), 25.221(a)(1)(i)(B), 25.222(a)(1)(i)(B), 25.226(a)(1)(i)(B), and 25.227(a)(1)(i)(B) state that EIRP density may exceed the routine envelopes by as much as 6 dB in up to 10% of the sidelobes and that the region of the main reflector spillover energy is to be considered as a single lobe for purposes of this rule. Provisions in Section 25.209(a)(3) and (4), which in combination apply to FSS earth station operation in any frequency band, afford the same allowance with respect to off-axis gain envelopes. In the *Further Notice*, we proposed to amend the EIRP density provisions to state, instead, that EIRP density may exceed the routine envelopes in the plane perpendicular to the GSO arc by up to 6 dB in the region of main reflector spillover energy and by up to 6 dB in 10% of the range of theta angles not included in that region.<sup>348</sup> We proposed to amend the off-axis gain provisions in the same manner.<sup>349</sup> We invited comment on whether the routine off-axis EIRP density limits for emissions in the plane tangent to the GSO arc should similarly include a separate allowance for backlobe emissions in the region of main reflector spillover energy.

150. Sections 25.138(a)(3) and 25.223(b)(3) stipulate the allowed sidelobes in excess of EIRP density envelopes for routine licensing of conventional Ka-band earth stations and 17/24 GHz BSS feeder-link earth stations. We proposed clarifying amendments in these rules to state that the EIRP density envelopes for co-polarized signals in Sections 25.138(a) and 25.223(b) may be exceeded by up to 3 dB in up to 10% of the range of theta angles from 10-180° on each side of the line from the earth station to the target satellite.<sup>350</sup>

<sup>346</sup> As revised by this Second Report and Order, Section 25.218 will also apply to the “extended C-band.” See Section IV.J.16., *infra*.

<sup>347</sup> *Further Notice*, 29 FCC Rcd at 12138, 12147, ¶¶ 62, 96.

<sup>348</sup> *Id.*, 29 FCC Rcd at 12138, ¶ 63.

<sup>349</sup> *Id.*, 29 FCC Rcd at 12147, ¶ 96. Specifically, this revision to the sidelobe allowance for routine gain envelopes was contemplated in the *Further Notice*, but not fully implemented in the proposed amendments to Section 25.209.

<sup>350</sup> *Id.*, 29 FCC Rcd at 12138, ¶ 64.

151. In contrast, there is no provision in Section 25.209(a)(2) allowing antenna gain in excess of the specified envelope in “the plane of the geostationary satellite orbit” for antennas transmitting in the conventional Ku-band or conventional Ka-band. We proposed to include such allowances in text in Section 25.209 that would specify routine gain envelopes for antennas transmitting in the conventional Ku-band different from those applicable in the 28.35-30.0 GHz band and 17/24 GHz BSS feeder uplink bands.<sup>351</sup>

152. Finally, the *Further Notice* observed that Section 25.209(h) omits the sidelobe exceedance allowance adopted for Ku-band NGSO FSS gateway stations, which is the same allowance given to Ku-band earth stations transmitting to GSO satellites. We proposed to correct the omission.<sup>352</sup>

153. *Discussion.* As an initial matter, SIA supports our proposal to codify in Section 25.209(h) the sidelobe allowance the Commission adopted for Ku-band NGSO FSS gateway stations.<sup>353</sup>

154. AvL, a manufacturer of earth station antennas, supports our proposals to specify sidelobe allowances in 10% of an angular range and to provide a separate allowance for main reflector spillover energy in the plane perpendicular to the GSO arc.<sup>354</sup> AvL recommends making the same 6 dB allowance for main reflector spillover energy available in the plane tangent to the GSO arc.

155. SIA and EchoStar, however, suggest a different general approach to allowing sidelobe and backlobe excesses based on Recommendation ITU-R S.732-1.<sup>355</sup> SIA’s proposal would divide into segments the range of off-axis angles in which the antenna gain envelope or EIRP density envelope may be exceeded. Gain or EIRP density could exceed routine limits in 10% of the entire angular range, up to the maximum exceedance specified for the segment. EchoStar supports SIA’s proposal.<sup>356</sup> EchoStar argues that the impact on potential interference of sidelobes exceeding routine limits is greater if those sidelobes occur near the main lobe than if they are at wider off-axis angles. As a result, EchoStar contends that a flat limit on sidelobe excesses across the entire permitted range is unduly restrictive with respect to lobes far removed from the main lobe.

156. We adopt most of our proposals on this issue, with certain changes to reconcile the sidelobe allowances with respect to routine envelopes for off-axis gain and EIRP density. We decline to adopt SIA’s proposal. SIA’s proposal makes use of angular segments that are based on current envelopes for antenna gain and EIRP density. This angular segmentation is inconsistent with the modified, technology-neutral antenna gain and EIRP density envelopes we adopt below for operation in the conventional Ku-band and conventional Ka-band. In addition, SIA’s proposal is more complicated than the approach we are adopting, and tends to afford less flexibility to applicants with respect to the placement of sidelobes. Further, while we agree with EchoStar’s observation that higher sidelobes near the main lobe can result in a greater potential for interference, we do not anticipate that our proposal will result in harmful interference to adjacent space station operators, and, therefore, prefer a simpler, more flexible approach.

157. Accordingly, we adopt our proposal to specify that, for routine licensing purposes, antenna gain and EIRP density excesses above the specified envelopes are permitted in 10% of an angular

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<sup>351</sup> See *id.*, 29 FCC Rcd at 12147, ¶ 97, 12199-200 (proposed text of Section 25.209(a)(2), (a)(3), (a)(5), (a)(6)).

<sup>352</sup> *Id.*, 29 FCC Rcd at 12148, ¶ 101.

<sup>353</sup> SIA Comments at 16. As discussed in Section IV.J.2. above, we decline SIA’s recommendation to define theta as the angle from the axis of the main lobe, including for purposes of Section 25.209(h).

<sup>354</sup> AvL Comments at 1.

<sup>355</sup> See SIA Comments at 9-10; Letter from Tom Stroup, President, SIA to Marlene H. Dortch, Secretary, FCC, at 2-3, Exhibit B (filed July 15, 2015) (SIA July *Ex Parte*); EchoStar Comments at 34-35.

<sup>356</sup> See generally EchoStar Comments at 34-35.

range, rather than in 10% of the sidelobes within that angular range.<sup>357</sup> We will also add separate allowances for antenna gain and EIRP density in the region of main reflector spillover energy of up to 6 dB above the routine envelopes in the plane tangent to the GSO arc. This change is consistent with the backlobe allowances regarding the plane perpendicular to the GSO arc. In addition, we will harmonize the proposed sidelobe allowance for EIRP density specifications in the plane tangent to the GSO arc in Sections 25.138(a)(3) and 25.223(b)(3) with the proposed allowances for antenna gain and EIRP density in other Sections, by specifying the permitted angular range as between 7-180°, rather than between 10-180°.<sup>358</sup> Finally, we adopt our proposal to codify the sidelobe allowance in Section 25.209(h) that was previously inadvertently omitted.

## 6. EIRP Density Specifications for Cross-Polarized Signals

158. *Background.* The rules that prescribe off-axis EIRP density envelopes for routine licensing of conventional Ka-band earth stations, 17/24 GHz BSS feeder-link earth stations, and earth stations on mobile platforms specify separate envelopes for cross-polarized signals at theta angles up to 9.2°.<sup>359</sup> In the *Further Notice*, we invited comment as to whether the EIRP density specifications in Section 25.218 should also include a separate envelope for cross-polarized signals, given that cross-polarized emissions at off-axis angles can contribute to interference at adjacent orbital locations.<sup>360</sup>

159. *Discussion.* EchoStar argues there is no need to specify off-axis EIRP density limits in Section 25.218 for cross-polarized signals at angles greater than seven degrees from the direction of maximum gain, because their impact on potential interference is negligible.<sup>361</sup> SIA contends that the impact of the cross-polarization envelopes beyond seven degrees is limited and does not warrant specific treatment in any rule.<sup>362</sup> We agree with these observations, and amend the antenna gain and EIRP density limits on cross-polarized signals for conventional Ka-band earth stations, 17/24 GHz BSS feeder-link earth stations, and earth stations on mobile platforms, to stop at seven degrees off-axis. No party, however, objects to the addition of a separate EIRP density envelope in Section 25.218 for cross-polarized signals at theta angles up to seven degrees. We adopt this amendment to address the potential for interference from these signals, consistent with our treatment of cross-polarized emissions in other rule Sections.

## 7. Limits on Aggregate EIRP Density

160. *Background.* In the *Further Notice*,<sup>363</sup> we addressed off-axis EIRP density limits for routinely licensed earth stations in Sections 25.138, 25.218, 25.221, 25.222, 25.226, and 25.227, as well as the routine input power density limits in Section 25.134 for stations in satellite networks operating in the conventional C or Ku-band using digital modulation. Noting that in the definition of the term N included in these rules the phrase “in the same satellite receiving beam” is potentially ambiguous, we proposed to define N as the actual number of simultaneous co-frequency transmissions at any given time to the same target satellite, and to stipulate that N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite. Further, we proposed to delete the stipulation that N=1 for stations operating pursuant to FDMA or TDMA network protocols since operation with such protocols would not necessarily preclude simultaneous co-frequency transmission by multiple earth stations to the same target satellite. Finally, we proposed to incorporate the “minus 10log(N)” formula in

<sup>357</sup> See SIA Comments at 9-10; AvL Comments at 1; EchoStar Comments at 34-35.

<sup>358</sup> See *Further Notice*, 29 FCC Rcd at 12199, ¶ 101.

<sup>359</sup> See, e.g., 47 C.F.R. § 25.138(a)(4).

<sup>360</sup> See *Further Notice*, 29 FCC Rcd at 12138, ¶ 65.

<sup>361</sup> EchoStar Comments at 35.

<sup>362</sup> See SIA Comments at 16, 17.

<sup>363</sup> See *Further Notice*, 29 FCC Rcd at 12138-40, ¶¶ 66-70.

the input power density criteria for certain individually licensed analog Ku-band earth stations in Section 25.212(c)(1), for certain individually licensed analog C-band earth stations in Section 25.212(d), and into the EIRP density envelopes for analog earth station operations in Section 25.218.

161. We also proposed changes to the associated “1 dB rules” for earth stations on mobile platforms.<sup>364</sup> Specifically, we proposed to clarify the text of the existing “1 dB” rules in Sections 25.221, 25.222, 25.226, and 25.227 to state that aggregate EIRP density from stations in a network toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits determined by the “minus  $10\log(N)$ ” formula if  $N=1$ . In addition, we proposed to include similar provisions in Section 25.138(a) and in Section 25.218 to afford operators additional flexibility.

162. *Discussion.* Commenters addressing the issue uniformly oppose the proposed new definition of  $N$ , generally arguing that it is unnecessary to prevent interference and would prove unduly restrictive. Commenters particularly object to redefining  $N$  as the number of terminals that can simultaneously transmit on a co-frequency basis to the same target satellite instead of within a given receiving beam on the target satellite, as this definition effectively shifts the burden of complying with the aggregate EIRP density limit from only the earth stations transmitting to one target satellite receiving beam to all of the earth stations transmitting to the same satellite.<sup>365</sup> ViaSat and EchoStar both argue that the proposed redefinition of  $N$  would preclude efficient spectrum reuse through state-of-the-art multiple beam satellites by requiring transmit power levels to be reduced to an impractical extent.<sup>366</sup> Both SIA and Inmarsat assert that spot beam satellites have been operating for some time now under the current definition of  $N$  with no identified interference problems,<sup>367</sup> and SIA further cites the mitigating factors of decreasing gain-to-temperature ratio ( $G/T$ ) with increasing beam size of the victim satellite, transmitting earth station location offset from the center of the victim satellite’s receiving beam peak, and the use of orthogonal frequency reuse patterns in spot beam satellites.<sup>368</sup> Multiple commenters urge the Commission to eliminate the “ $10\log(N)$ ” formula entirely and to replace it with a more flexible “aggregate emissions” approach that would require the aggregate off-axis EIRP density for co-frequency earth stations in each target satellite receiving beam not to exceed the level specified for a network with only a single co-frequency earth station transmitting at a given time.<sup>369</sup>

163. Although commenters generally support the addition of new provisions in Sections 25.138(a) and 25.218 to afford additional flexibility, they similarly oppose including references to  $10\log(N)$  and the 1 dB limit in these new requirements, recommending instead that operators be allowed to comply with an aggregate off-axis EIRP-density limit.<sup>370</sup>

<sup>364</sup> *Id.*, 29 FCC Rcd at 12140, ¶¶ 71-72. Provisions containing the 1 dB factor provide greater flexibility to networks able to manage aggregate EIRP density by dynamically controlling the EIRP density of individual earth stations, because they do not require each earth station in the satellite network transmitting simultaneously in the same frequency range to the same target satellite to limit EIRP density to a constant value. Rather, they require the aggregate EIRP density toward satellites other than the target satellite to be kept at least 1 dB below the limits for stations operating in networks that do not permit more than one earth station to transmit at the same time in the same frequency range, *i.e.*, 1 dB below the levels determined according to the “minus  $10\log(N)$ ” formula with  $N=1$ .

<sup>365</sup> *See, e.g.*, ViaSat Comments at 8.

<sup>366</sup> *Id.* at 6-8; EchoStar Comments at 35-39.

<sup>367</sup> SIA Comments at 10; Letter from Tom Stroup, President, SIA to Marlene H. Dortch, Secretary, FCC, at 2 (filed Oct. 23, 2015) (SIA October *Ex Parte*); Inmarsat Comments at 4-5.

<sup>368</sup> SIA also provided an analysis in support of its argument that examines the impact on  $\Delta T/T$  between two spot beam satellite networks with different size spot beams. SIA Comments, Annex A.

<sup>369</sup> *Id.* at 11; EchoStar Comments at 40; ViaSat Comments at 2.

<sup>370</sup> ViaSat Comments at 2-6; SIA Comments at 12, 19-20, Annex 1 at 88, 96, 107, 118.

164. Although SIA initially urged the Commission to extend the “1 dB rule” to fixed earth stations in Sections 25.138(a) and 25.218, SIA now withdraws its support for this proposal and instead urges the Commission to delete this rule from Sections 25.221, 25.222, 25.226, and 25.227 and to adopt alternate text stating that the effective aggregate off-axis EIRP density from all terminals in the same target satellite receiving beam must not exceed the routine licensing limits.<sup>371</sup> Other commenters similarly support elimination of the 1 dB margin in rules for selective power control systems, arguing that it imposes an unnecessary performance limitation and could result in a significant decline in the useable capacity of the network.<sup>372</sup> ViaSat points to the maturation of dynamic power control technology, its successful operation without difficulty for over a decade, and the extension of its use to fixed earth station networks in various frequency bands.<sup>373</sup> Noting that the case where all earth stations operate with the same power level is simply a subset of the more generic case where the power can vary among multiple users, EchoStar advocates combining the “minus 10log(N)” and “1 dB” rules into a single rule in Section 25.115 to allow co-frequency operation for all earth stations under a more flexible requirement.<sup>374</sup>

165. We will not adopt our proposal to modify the definition of N in Sections 25.134, 25.138, 25.218, 25.221, 25.222, 25.226, and 25.227. We are persuaded by commenters’ arguments that redefining N could impose an overly restrictive burden on operators of satellite networks that may inhibit the deployment of spectrally efficient spot beam satellite technology. Rather, as commenters suggested, we will eliminate the “minus 10log(N)” formula entirely from our rules. We will replace it with a requirement that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam must not exceed the off-axis EIRP density limit permissible for a single earth station, as specified by the relevant rule Section.<sup>375</sup> We believe that this approach will sufficiently limit the possibility of harmful interference to adjacent satellite networks while simultaneously providing the necessary flexibility to earth station operators. We will extend this same approach to the input power density criteria for certain individually licensed analog Ku-band earth stations in Section 25.212(c)(1),<sup>376</sup> for certain individually licensed C-band earth stations in Section 25.212(d), and into the EIRP density envelopes for analog earth station operations in Section 25.218, as our rationale for addressing the potential contribution of individually licensed earth stations to aggregate off-axis interference levels remains unchanged, and the record does not provide a persuasive reason for rejecting this proposal.<sup>377</sup> In addition, we will adopt our proposed new requirements in Sections 25.138(a) and 25.218, but will not include references to 10log(N) or the 1 dB limit, following instead the approach recommended by SIA.<sup>378</sup>

166. In clarifying that the phrase “in the same satellite receiving beam” that currently appears in the definition of N refers to the target satellite, rather than a victim satellite, the Commission recognizes that the aggregate off-axis transmissions into the receiving beam of an adjacent co-frequency satellite network may originate from earth stations in different (*i.e.*, multiple) receiving beams of the

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<sup>371</sup> SIA Comments at 12.

<sup>372</sup> Boeing Comments at 12-13; ViaSat Comments at 3-6; EchoStar Comments at 40.

<sup>373</sup> ViaSat Comments at 4.

<sup>374</sup> EchoStar Comments at 39-40. Although intending to offer the flexibility provided under the current 1 dB rules, EchoStar proposes elimination of the specific 1 dB margin from the requirement.

<sup>375</sup> Additional language addressing operation with contention protocols is discussed below in Section IV.J.8.

<sup>376</sup> On the same grounds, we will also incorporate this rule into Section 25.212(c)(2) for individually licensed digital Ku-band earth stations.

<sup>377</sup> We proposed extension of these provisions to rule Sections addressing individually licensed earth stations because aggregate EIRP density can be generated by such earth stations transmitting to a target satellite with multiple spot beams. See *Further Notice*, 29 FCC Rcd at 12140, ¶ 70.

<sup>378</sup> SIA Comments at 19-20, Annex 1 at 88, 96, 107, 118; SIA October *Ex Parte*.



target satellite. We believe, however, that these transmissions are unlikely to be problematic in the conventional Ka-band, given the relatively homogeneous interference environment resulting from the widespread use of spot beam satellites.

167. As spot beam satellite systems increasingly migrate to other frequency bands, however, and in particular to the conventional and extended Ku-bands, we anticipate that sharing situations may sometimes arise where a space station employing wide-area beams will operate adjacent to one or more spot beam satellites with multiple co-frequency transmitting earth stations lying within the victim satellite's receiving beam, but not in the same target satellite receiving beam. In such situations, the wide-area-beam satellite system may be subject to aggregate off-axis emissions that exceed the limit permissible for a single earth station. Although we expect that these instances will be infrequent, and that the interference will be largely mitigated by factors such as the decreased G/T of the wide-area beam and the gain roll-off over the service area, we cannot predict in advance its extent or how problematic it may be. If interference due to aggregate off-axis emissions from earth stations transmitting to another satellite does occur, both operators must cooperate fully in order to coordinate their systems so that each may continue its operations. However, coordination will not be required unless the aggregate interference into the receiving beam of the victim satellite, from all co-frequency earth stations transmitting simultaneously to the same target satellite, exceeds the interference that would be generated by a single earth station located at the peak of the victim satellite's receiving antenna beam, and transmitting at the maximum off-axis EIRP density permitted under the relevant rule Section.

168. Finally, as SIA suggests, we will eliminate the "1 dB" requirement from the rules for FSS earth stations on mobile platforms using variable power density control in Sections 25.221, 25.222, 25.226, and 25.227. In light of the increasingly widespread operation of systems employing dynamic power control and the absence of interference complaints over the past decade, we are similarly persuaded that this constraint is no longer necessary. We will not, however, adopt EchoStar's proposal to articulate these provisions only once in a single rule specifying earth station application requirements, which we did not propose in the *Further Notice*. In this instance, we believe it is more useful to have these operational requirements stated alongside the other applicable off-axis transmission requirements.

## 8. Operation with Contention Protocols

169. *Background.* As explained in the *Further Notice*,<sup>379</sup> transmissions from earth stations in a network using contention protocols can "collide" with one another, resulting in an aggregate EIRP density higher than routine limits that may interfere with the reception of co-frequency space stations. Because of this potential for increased interference, the Commission has required applicants for Ku-band Very Small Aperture Terminal (VSAT) networks to certify that use of contention protocols will be reasonable.<sup>380</sup> Noting the absence of complaints of harmful interference from the use of contention protocols, and recognizing the findings in the *Earth Station Eighth Report and Order* that use of contention protocols tends to reduce interference risk,<sup>381</sup> we proposed to amend Section 25.134 to state that collisions of burst transmissions resulting from contention protocol operation need not be taken into account when determining the value of N in the "minus 10log(N)" formula.<sup>382</sup> We also proposed to include the same proviso in the definition of N in Sections 25.138 and 25.218, and to include a similar exception for contention protocol operation in the limit on aggregate EIRP density for networks operating with variable power control that we proposed to incorporate into Sections 25.138 and 25.218.<sup>383</sup> In addition, we invited comment on the advisability of inserting analogous provisions in Sections 25.221, 25.222, 25.226, and

<sup>379</sup> See *Further Notice*, 29 FCC Rcd at 12141, ¶ 73.

<sup>380</sup> See *id.*, 29 FCC Rcd at 12141, ¶ 74.

<sup>381</sup> See *Earth Station Eighth Report and Order*, 23 FCC Rcd at 15132-33, ¶¶ 77, 79.

<sup>382</sup> *Further Notice*, 29 FCC Rcd at 12141-42, ¶ 75.

<sup>383</sup> *Id.*

25.227 for stations operating with contention protocols on mobile platforms. We also invited comment on deletion of the requirement in Section 25.134(g)(4) that Ku-band VSAT applicants certify that contention protocol usage will be reasonable.<sup>384</sup>

170. *Discussion.* All comments the Commission received on this topic favor excluding collisions of data burst transmissions resulting from use of a contention protocol when determining aggregate off-axis EIRP density values. Both SIA and Kymeta propose language for the “minus  $10\log(N)$ ” rule that would include such an exception.<sup>385</sup> EchoStar also supports our proposal, and recommends further that the Commission extend this approach to mobile terminals authorized under Sections 25.221, 25.222, 25.226 and 25.227, claiming that the use of contention protocols by these terminals will reduce adjacent-satellite interference.<sup>386</sup>

171. Consistent with commenters’ views, we will include language in our rules stating that when calculating aggregate off-axis EIRP density levels, aggregate interference resulting from contention protocol transmissions need not be taken into account. In the *Further Notice*, we proposed including language in the definition of N in the “minus  $10\log(N)$ ” rules that would exclude use of contention protocol transmissions when determining the value of N, and we proposed to include a similar exception for contention protocol operation in the limit on aggregate EIRP density for networks operating with variable power control in Sections 25.138 and 25.218. Since we are amending those provisions to delete references to the “minus  $10\log(N)$ ” formula,<sup>387</sup> we will include the exception as a part of the new requirement that addresses aggregate interference into adjacent satellites from simultaneously transmitting earth stations in Sections 25.138 and 25.218. In addition, we will incorporate analogous language in Sections 25.221, 25.222, 25.226, and 25.227 for stations using contention protocols on mobile platforms.

172. Only SIA commented on our proposal to delete the certification requirement in Section 25.134(g)(4). SIA proposes that this language be amended and moved to replace the current requirement in Section 25.115(i).<sup>388</sup> Specifically, SIA asserts that because earth station networks other than VSATs can use contention protocols, the VSAT-specific requirement in Section 25.134(g)(4) should be deleted, and Section 25.115(i) should be amended to require any earth station applicant seeking a blanket license and planning to use a contention protocol to certify that its contention protocol usage will be reasonable.<sup>389</sup> We concur with SIA’s proposed approach, and will delete Section 25.134(g)(4) and amend Section 25.115(i) to reflect that the certification requirement applies to all earth station network applicants planning to use contention protocols.

## 9. Analog Signal Bandwidth

173. *Background.* The routine licensing criteria for analog earth station operation in Section 25.212 apply only to transmission of analog signals with bandwidths of 200 kHz or less, or 1 MHz or less for command signals at a band edge. There are no such limits on analog signal bandwidth in the routine licensing criteria for analog VSAT operation in Section 25.134, nor in the off-axis EIRP density criteria in Section 25.218. The Commission recognized the appropriateness of excluding wideband analog earth station operation from routine licensing based on compliance with limits on power density due to the increased likelihood that the time-varying nature of the power density within such transmissions will cause increased interference relative to digital or narrow-band analog transmissions at similar power

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<sup>384</sup> *Id.*

<sup>385</sup> See SIA Comments at 11; Kymeta Comments, Exhibit 1.

<sup>386</sup> See EchoStar Comments at 41.

<sup>387</sup> See Section IV.J.7., *supra*.

<sup>388</sup> Section 25.115(i) requires VSAT network earth station applicants that plan to use a contention protocol to certify that they will comply with the requirements of Section 25.134(g)(4). See 47 C.F.R. §§ 25.115(i), 25.134(g)(4).

<sup>389</sup> See SIA Reply, Annex B at 19, 35.

levels. Accordingly, we proposed to amend Section 25.218 to limit the applicability of the routine licensing criteria in that Section to exclude transmission of band-edge analog command signals with bandwidths greater than 1 MHz or transmission of other analog uplink signals with bandwidths greater than 200 kHz.<sup>390</sup> As a consequence, we further proposed to eliminate Section 25.218(a)(2) as the specific exclusion for analog video transmissions would be unnecessary.<sup>391</sup> Similarly, we proposed to amend the routine licensing rules for VSAT networks in Section 25.134.<sup>392</sup> However, our decision to delete Section 25.134 in its entirety renders this proposal moot.<sup>393</sup>

174. *Discussion.* We received no comment on this topic apart from SIA, which supported our proposals.<sup>394</sup> Accordingly, we adopt the proposed changes to Section 25.218, including the consequent deletion of Section 25.218(a)(2).

#### 10. Alternative Routine Licensing Criteria for Conventional Ka-band Earth Stations

175. *Background.* In the *Further Notice*, we proposed to facilitate routine licensing by incorporating alternative off-axis gain, input power density, and antenna-size criteria in Sections 25.134 and 25.212 for applicants for earth stations transmitting to GSO satellites in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands.<sup>395</sup> We proposed to specify an input power density limit of 3.5 - 10log(N) dBW/MHz, and a minimum equivalent antenna diameter of 66 centimeters, for routine licensing of such earth stations.<sup>396</sup> We also proposed to amend Section 25.132 to allow such applicants to certify compliance with relevant standards in Section 25.209(a) and (b) instead of submitting antenna gain patterns. In addition, we proposed to insert separate gain specifications for conventional Ka-band antennas in Section 25.209(a) and (b) for off-axis angles between 48° and 85° that would be consistent with the off-axis EIRP density specifications in Section 25.138(a) and the proposed input power density.<sup>397</sup>

176. *Discussion.* We adopt our proposed alternative approach for routine licensing of FSS earth stations transmitting to GSO satellites in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands that permits such applicants to demonstrate compliance with off-axis gain and accompanying input power density levels. Accordingly, we will incorporate off-axis gain certification requirements combined with

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<sup>390</sup> See *Further Notice*, 29 FCC Rcd at 12142-43, ¶ 78.

<sup>391</sup> *Id.*

<sup>392</sup> *Id.* The Commission did not propose to specify a limit on the bandwidth of command signals in Section 25.134 because VSAT earth stations are not used to perform telemetry, tracking, and control operations.

<sup>393</sup> See Section IV.J.13, *infra*.

<sup>394</sup> See SIA Comments at 13.

<sup>395</sup> See *Further Notice*, 29 FCC Rcd at 12143-44, ¶¶ 80-81. Earth station applicants may qualify for routine licensing by certifying compliance with limits on antenna size, off-axis gain, and input power density, or by demonstrating compliance with limits on off-axis EIRP density. At present, applicants for earth station operation in the conventional Ka-band are limited to the latter approach, while earth station applicants in conventional C- and Ku-bands have access to both. See 47 C.F.R. §§ 25.138, 25.211, 25.212, 25.218.

<sup>396</sup> *Further Notice*, 29 FCC Rcd at 12143-44, ¶ 81. These routine input power density limits were proposed for inclusion in Sections 25.134(c) and 25.212(g), respectively.

<sup>397</sup> *Id.* Operating at the proposed input power density level, a transmitting antenna conforming to the gain patterns specified for conventional Ka-band antennas in Section 25.209(a)(2) and (b) would generate EIRP density levels closely matching those specified in Section 25.138(a) for off-axis angles from 2° to 48°. For off-axis angles between 48° and 85°, however, the EIRP density would lie below the corresponding limits specified Section 25.138(a) by 10 dB.

our proposed input power density value of 3.5 dBW/MHz,<sup>398</sup> into Section 25.212(e),<sup>399</sup> and will reference these routine licensing requirements in Section 25.115.<sup>400</sup> We also amend Section 25.132 to allow applicants to certify compliance with relevant standards in Section 25.209(a) and (b) instead of submitting antenna gain patterns. As we noted in the *Further Notice*, these rule changes will make it more convenient for some earth station operators to qualify for routine licensing.<sup>401</sup> These proposals were supported by SIA<sup>402</sup> and were not opposed by other commenters. We will not, however, insert our proposed separate gain specifications at off-axis angles between 48° and 85° for conventional Ka-band antennas in Section 25.209(a) and (b). Our decision herein to adopt more technologically neutral off-axis EIRP density envelopes in Section 25.138(a) and (b), and to make conforming changes to Section 25.209, renders this proposal moot.

177. We will not include a minimum antenna diameter requirement for routine licensing of conventional Ka-band earth stations. We are persuaded by commenters' arguments that generally oppose including this criterion, arguing that the off-axis EIRP density levels necessary for routine licensing may be met regardless of antenna size, and that mandating a minimum antenna diameter may hinder deployment of newer antenna technologies that do not rely on parabolic reflectors.<sup>403</sup> EchoStar argues that all applications for which the antenna is compliant with Section 25.209 and that meet the power density limits at the antenna flange should be eligible for routine processing regardless of the antenna diameter, and that there is no public interest reason that antennas with smaller diameters should be subjected to additional scrutiny.<sup>404</sup> ViaSat similarly claims this approach might unduly restrain the deployment of new antenna technologies that may rely on antenna diameters that are smaller than a specified size.<sup>405</sup> In addition to opposing a Ka-band minimum antenna diameter requirement as unnecessary and not technologically neutral,<sup>406</sup> SIA further proposed harmonizing changes to eliminate minimum antenna diameter requirements for routine licensing of Ku-band GSO FSS earth stations in Sections 25.134 and 25.212.<sup>407</sup>

178. For the reasons discussed above, we also eliminate from our rules the minimum equivalent antenna diameter specification as a condition for routine licensing for conventional and extended C-band and conventional and extended Ku-band earth stations in Sections 25.115(a)(2)(iii), 25.211(d)(2), 25.211(d)(3), 25.212(c)(1), 25.212(c)(2), and 25.212(d). This action is a logical outgrowth

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<sup>398</sup> Consistent with our decision in Section IV.J.7. above to eliminate the "10log(N)" formula from our rules, we are not including this term in the off-axis EIRP density requirements for licensing of conventional Ka-band blanket-licensed earth station networks.

<sup>399</sup> We move the revised text proposed for Section 25.212(e) to a new paragraph (h) so that it remains at the end of the Section. See Section IV.J.13., *infra*.

<sup>400</sup> Because, as elaborated in Section IV.J.13. below, we are deleting rule Section 25.134 in its entirety, we will cross-reference in Section 25.115 the relevant alternative off-axis gain and input power density requirements in Section 25.212, instead of including them in Section 25.134 as contemplated in the *Further Notice*.

<sup>401</sup> *Further Notice*, 29 FCC Rcd at 12143, ¶ 80.

<sup>402</sup> SIA Comments at 13.

<sup>403</sup> See SIA Reply at 5-6; EchoStar Reply at 11; ViaSat Reply at 4. In contrast to SIA, EchoStar, and ViaSat, AvL recommends that the minimum antenna diameter for conventional Ka-band earth stations be set at 60 centimeters, based upon the frequency ratio between the conventional Ka-band and Ku-band and the 1.2 meter diameter requirement for routine licensing of Ku-band earth stations. See AvL Comments at 2.

<sup>404</sup> EchoStar Reply at 11.

<sup>405</sup> ViaSat Reply at 4.

<sup>406</sup> SIA Reply at 5-6.

<sup>407</sup> SIA also proposed deletion of Section 25.134 and incorporation of the relevant provisions into Section 25.115. SIA Comments at 14.

of our proposal to harmonize the routine licensing options for GSO FSS earth station operation.<sup>408</sup> We proposed to add alternative criteria for routine licensing of conventional Ka-band GSO FSS earth stations for consistency with the routine licensing provisions in other bands, because the costs and benefits of such licensing criteria are generally the same in the different bands.<sup>409</sup> Accordingly, for the same reasons that we decline to adopt the proposed minimum equivalent antenna diameter for routine licensing of conventional Ka-band earth stations, we also remove the minimum antenna diameter requirement for other frequency bands. We believe that harmonization of our rules in all frequency bands and the elimination of unnecessary requirements will provide greater clarity and utility to applicants.

179. In its comments, EchoStar not only supports extending the new routine licensing approach to conventional Ka-band earth station applicants, but also advocates that both the new method (conformance with discrete off-axis antenna gain and input power density values) and the currently specified method (conformance with off-axis EIRP density values) be extended to the entire 27.5-30.0 GHz band.<sup>410</sup> EchoStar asserts that applying two-degree spacing criteria to portions of this band where GSO satellites do not operate on a primary basis will add clarity and facilitate sharing among networks of equal status.<sup>411</sup> We decline to adopt EchoStar's proposal. Our intent in adopting the alternative approach to routine licensing for conventional Ka-band earth station applicants is to afford these applicants the same two approaches to routine licensing that are currently available to earth station applicants in the conventional C and conventional Ku-bands. The *Further Notice* did not contemplate extending routine licensing procedures to portions of the 27.5-30.0 GHz band in which GSO FSS earth stations operate on a secondary or non-routine basis under the Ka-band Plan,<sup>412</sup> and we decline to do so based on the present record.

180. AvL supports our proposal to allow conventional Ka-band earth station applicants to certify compliance with relevant standards in Section 25.209(a) and (b) instead of submitting antenna gain patterns, but recommends that the rules require any such certification be signed by a senior employee of the company to guarantee compliance.<sup>413</sup> In addition, AvL recommends that the antenna manufacturer be required to submit a general radiated power envelope to ensure that the applicant confirms its understanding of the applicable antenna performance requirements in an easily verifiable manner. We will not adopt AvL's proposals to impose these additional requirements. We are not convinced that it is appropriate to impose such filing requirements on conventional Ka-band earth station applicants that are not imposed on routinely licensed earth station applicants in other frequency bands. In addition, Section 25.132 requires applicants to submit radiation pattern measurements to the Commission upon request.<sup>414</sup>

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<sup>408</sup> See *Further Notice*, 29 FCC Rcd at 12143, ¶ 80 (proposing to adopt the same alternative licensing approach for earth station applicants in the conventional Ka-band that is available to applicants in the conventional C- and Ku-bands, in light of the similar licensing considerations in the different bands).

<sup>409</sup> See generally *id.*

<sup>410</sup> EchoStar Reply at 11. In this Second Report and Order the Commission defines "conventional Ka-band" as the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30 GHz bands. See Section IV.K.1., *infra*.

<sup>411</sup> EchoStar Reply at 12.

<sup>412</sup> The Commission issued a series of Orders in CC Docket No. 92-297 and IB Docket No. 98-172 establishing a designation plan for use of the 27.5-30.0 GHz band. *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, CC Docket No. 92-297, First Report and Order and Fourth Notice of Proposed Rulemaking, 11 FCC Rcd 19005 (1996) (*28 GHz First Report and Order*), modified by Third Report and Order, 12 FCC Rcd 22310 (1997) (*28 GHz Third Report and Order*); *18 GHz Report and Order*, 15 FCC Rcd 13430.

<sup>413</sup> AvL Comments at 2.

<sup>414</sup> 47 C.F.R. § 25.132(a)(1).



We believe this approach is sufficient to ensure that the relevant antenna performance information is available if needed, while not unduly burdening applicants.

### 11. Modified Off-Axis EIRP Density Envelopes

181. Kymeta, a manufacturer of flat-panel earth station antennas, proposes a new, technology-neutral off-axis EIRP density envelope that it asserts will make it easier for some Ka-band earth station applicants to apply for routine licensing.<sup>415</sup> Kymeta argues that the envelope currently codified in Section 25.138(a) appears to trace the natural shape of the radiation pattern produced by a parabolic reflector, and as such may pose unnecessary obstacles to the routine licensing of Ka-band earth stations with flat-panel antennas.<sup>416</sup> Kymeta urges the Commission to adopt its proposed envelope, which is intended to address steerable flat-panel antennas that can have sidelobe patterns different from the more circularly symmetric distribution typical of parabolic antennas, and consequently may be precluded from meeting the criteria for blanket licensing under our current rules.<sup>417</sup> Specifically, Kymeta's proposed envelope differs from the one in our current rules in that it would flatten the EIRP density envelope for the off-axis angular range between 19.1° and 48°.<sup>418</sup> Kymeta and SIA also present technical analyses demonstrating that Kymeta's proposed envelope would not materially increase the interference expected to other satellites.<sup>419</sup>

182. SIA, EchoStar, and ViaSat support Kymeta's proposal, arguing that it will enable more rapid and cost-effective deployment of a wider range of state-of-the-art earth stations, while causing insignificant increased interference toward adjacent satellite networks.<sup>420</sup> SIA and Kymeta advocate further that this technology-neutral envelope be applied to FSS earth stations operating in the conventional Ku- and conventional Ka-bands, including ESVs, VMES and ESAAs, to harmonize technology-neutral rules and to facilitate licensing and deployment of a wider range of earth stations.<sup>421</sup> Accordingly, SIA proposes similar conforming amendments in its comments to the off-axis EIRP density envelopes for routine licensing of conventional Ku-band and conventional Ka-band earth stations in Sections 25.218, 25.222, 25.226, and 25.227.<sup>422</sup>

183. We adopt Kymeta's modified off-axis EIRP density envelope for routine licensing of conventional Ka-band GSO FSS earth stations, and amend Section 25.138(a)(1) and (2) accordingly.<sup>423</sup>

<sup>415</sup> Kymeta Comments at 7-8. Although initially presented as an alternative off-axis EIRP density envelope that, along with our current envelope, would permit routine licensing of Ka-band earth stations, both SIA and ViaSat recommend that Kymeta's envelope be adopted as a replacement for, rather than as an alternative to, the current off-axis EIRP density envelope in Section 25.138(a)(1) and (2). SIA Reply, Exhibit 2, Annex B at 36-39; ViaSat Reply at 3.

<sup>416</sup> Kymeta Comments at 8.

<sup>417</sup> *Id.* at 6.

<sup>418</sup> *Id.* at 7-8. For co-polarized signals in the plane tangent to the GSO arc, Kymeta's envelope would apply the value  $35.5-25\log(\theta)$  dBW/MHz only to values of  $\theta$  between 9.23° and 19.1°, while our current envelope extends this formula to values of  $\theta$  out to 48° off-axis. Beyond 19.1° off-axis, Kymeta would specify the constant EIRP density limit of 3.5 dBW/MHz. In the plane perpendicular to the GSO arc, an analogous pattern is proposed with the limits relaxed by 3 dB.

<sup>419</sup> Kymeta Comments, Exhibit 2. This initial analysis assumes a near-worst-case scenario and compares Kymeta's proposed envelope with the current envelope of Section 25.138 using an exceedance of 3 dB over the relevant off-axis angular range, resulting in only a 0.15 dB degradation in the victim's C/(N+I). SIA Reply, Exhibit 1; SIA July *Ex Parte*, Exhibit A. These analyses demonstrate an increase in the aggregate interference power into the victim's satellite of 0.2 dB or 0.19 dB, depending upon the assumptions made with regard to permitted exceedances.

<sup>420</sup> SIA Reply at 3-5, Exhibit 2; EchoStar Reply at 13-14; ViaSat Reply at 2-3.

<sup>421</sup> SIA Reply at 4, Annex B at 36-39.

<sup>422</sup> SIA Reply at 1-4, Annex B at 73-78, 92-93, 104-05, and 115-16.

<sup>423</sup> 47 C.F.R. § 25.138(a)(1), (2).

We agree with commenters that the current off-axis EIRP density envelope is defined by the performance characteristics of the historically prevalent parabolic dish antenna, and as such, may hinder the routine licensing of newer antenna technologies. Moreover, we are persuaded by commenter's technical analyses that increased interference into adjacent satellites will be negligible. For similar reasons, we also extend this approach to routine licensing of conventional Ku-band earth stations in Sections 25.218(e)(1) and (2), 25.218 (f)(1) and (2), 25.222, 25.223, 25.226, and 25.227, as proposed by Kymeta and SIA. We believe that adopting these new off-axis EIRP density envelopes will facilitate routine processing of a wider range of state-of-the-art earth station terminals that will benefit satellite service customers.

184. We will also amend the underlying antenna off-axis gain specifications contained in Section 25.209 for conventional Ku-band and conventional Ka-band earth stations. The off-axis antenna gain specifications are intended to dovetail with the off-axis EIRP density requirements, and to change one without amending the other would create a disjuncture in our rules and disparities in our approach to routine licensing of earth stations. Specifically, we will amend the off-axis gain specifications for conventional Ku-band and conventional Ka-band earth stations in Section 25.209(a) and (b) to conform these gain patterns to the off-axis EIRP density envelopes proposed by Kymeta and SIA.

185. These changes are a logical outgrowth of the proposals and requests for comment in the *Further Notice*. Specifically, we proposed alternative routine licensing criteria for conventional Ka-band earth stations to make it more convenient for some applicants to qualify for routine licensing.<sup>424</sup> We also proposed to harmonize the antenna gain and EIRP density envelopes for conventional Ka-band earth stations.<sup>425</sup> And we sought comment on how best to accommodate flat-plate antennas in our antenna measurement requirements.<sup>426</sup> In addition to our specific proposals, and in keeping with the broad streamlining objectives of this proceeding, we invited comment on "any alternative proposals that would improve the efficiency of the satellite licensing or operating rules and make them less burdensome."<sup>427</sup> Making the routine EIRP density envelopes for conventional Ku-band and conventional Ka-band earth stations technology-neutral will improve the efficiency of our licensing process by removing requirements premised on older technological designs and unnecessary for protection of other users.

## 12. Routine Gain Envelopes for 17/24 GHz BSS Feeder-link Stations

186. In the *Further Notice*, we proposed to amend Section 25.209 to indicate that the off-axis gain envelopes specified for earth stations transmitting in the 28.35-30 GHz band also apply to earth stations transmitting in the 24.75-25.25 GHz band.<sup>428</sup> We received no objections to our proposal to harmonize the gain standards for operation in these similar frequency bands. Below, however, we adopt modified, technology-neutral off-axis gain standards for earth station antennas transmitting in the 28.35-30 GHz band.<sup>429</sup> Accordingly, we adopt the same standards for antennas transmitting in the 24.75-25.25 GHz band, in light of the similar propagation characteristics and in keeping with our proposal to harmonize the gain standards in these bands.<sup>430</sup>

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<sup>424</sup> *Further Notice*, 29 FCC Rcd at 12143, ¶ 80.

<sup>425</sup> *Id.*, 29 FCC Rcd at 12143-44, ¶ 81.

<sup>426</sup> *Id.*, 29 FCC Rcd at 12149, ¶ 106.

<sup>427</sup> *Id.*, 29 FCC Rcd at 12119, ¶ 4.

<sup>428</sup> *See id.*, 29 FCC Rcd at 12143, ¶ 82.

<sup>429</sup> *See* Section IV.J.18., *infra*.

<sup>430</sup> Adoption of this gain envelope for antennas transmitting in the 24.75-25.25 GHz band is a logical outgrowth of our proposal to apply the same gain envelope to antennas transmitting in this band and in the 28.35-30 GHz band. *See id.*

### 13. Other Proposed Changes in Sections 25.134 and 25.212

187. *Background.* In the *Further Notice*, we proposed several changes to Section 25.134.<sup>431</sup> In the caption of that Section, and elsewhere in Part 25, we proposed to replace the term “CSAT network” or “CSAT system,” with the term “conventional C-band VSAT network”<sup>432</sup> consistent with the definition of “VSAT network” that we proposed to adopt in the *Further Notice*.<sup>433</sup> Further, we proposed to amend Section 25.134(a)(2) to indicate more clearly the routine licensing criteria for conventional C-band VSAT networks.<sup>434</sup> We also proposed to replace the requirements for non-routine VSAT network applications in Section 25.134(a)(2) and (b) with a general provision in Section 25.220 stating, among other things, that applications for fixed earth station operation in the conventional C-band or conventional Ku-band that do not qualify for routine processing under relevant criteria in Section 25.134, 25.211, 25.212, or 25.218 must meet the coordination requirements in Section 25.220.<sup>435</sup>

188. In addition, we sought comments on two proposals put forward by SIA. We invited comment on SIA’s proposal to add a provision in Section 25.134 that would allow a conventional Ku-band or conventional Ka-band VSAT applicant proposing to operate within a peak EIRP limit of 50 dBW to forego providing all other technical specifications and merely certify that the proposed operation will be in compliance with all applicable Commission rules.<sup>436</sup> In particular, we stated that commenters advocating for this proposal should provide a supporting technical analysis, which was lacking in SIA’s proposal.<sup>437</sup> We also invited comment on SIA’s suggestion that the Commission look to the type-approval approach that Europe has taken for VSAT terminals, which is based on earth station operators testing and declaring conformance with certain technical standards.<sup>438</sup> We noted that the Commission does not have such technical standards, but sought comment on the costs and benefits of adopting a standards-based approach and its appropriate scope.<sup>439</sup>

189. Finally, the *Further Notice* proposed non-substantive amendments to Section 25.212(e) to state simply that applications for authority for fixed earth station operation in the 5925-6425 MHz or 14.0-14.5 GHz band that do not qualify for routine processing under relevant criteria in Section 25.211, 25.212, or 25.218 are subject to the requirements in Section 25.220.<sup>440</sup>

190. *Discussion.* SIA and EchoStar assert that Section 25.134 should be deleted.<sup>441</sup> SIA argues that the VSAT-specific rules in Section 25.134 are unnecessary and duplicative of earth station

<sup>431</sup> *Further Notice*, 29 FCC Rcd at 12144-45, ¶¶ 83-87.

<sup>432</sup> *Id.*, 29 FCC Rcd at 12144, ¶ 83.

<sup>433</sup> *See id.*, 29 FCC Rcd at 12154, ¶ 131.

<sup>434</sup> *Id.*, 29 FCC Rcd at 12144, ¶ 84.

<sup>435</sup> *Id.*, 29 FCC Rcd at 12144-45, ¶ 85.

<sup>436</sup> *Id.*, 29 FCC Rcd at 12145, ¶ 86.

<sup>437</sup> *Id.*, 29 FCC Rcd at 12145, ¶ 86 n.116.

<sup>438</sup> European operators must test their equipment and declare conformity with the technical standards developed by the European Telecommunication Standards Institute before deploying and operating a new type of satellite earth station, but conformance with those standards exempts such stations from individual or blanket licensing requirements. *See, e.g.*, Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive); Electronic Communications Committee, ECC Decision of 24 March 2006 on Exemption from Individual Licensing of high e.i.r.p. satellite terminals (HEST) operating within the frequency bands 10.70-12.75 GHz or 19.70-20.20 GHz space-to-Earth and 14.00-14.25 GHz or 29.50-30.00 GHz Earth-to-space, ECC/DEC/(06)03.

<sup>439</sup> *Further Notice*, 29 FCC Rcd at 12145, ¶ 87.

<sup>440</sup> *Id.*, 29 FCC Rcd at 12145, ¶ 88.

<sup>441</sup> *See* SIA Comments at 14, Appendix B at 36-47, 55-63; SIA Reply at 5 n.16; EchoStar Comments at 50.

blanket licensing provisions contained in other rule Sections. SIA proposes to delete duplicative information that is already captured by other requirements, and to move the remaining information contained in Section 25.134 to Section 25.115, which contains requirements for earth station applications generally.<sup>442</sup> Regarding our proposal to delete the undefined term “CSAT,” however, SIA argues that it should be retained in Part 25 due to “other federal regulations” dealing with CSAT systems.<sup>443</sup>

191. We adopt the proposals of SIA and EchoStar to delete Section 25.134 as unnecessary. We agree that there is considerable redundancy between Section 25.134 and other provisions that address blanket licensing of earth station networks, and that any non-duplicative provisions may be incorporated into existing rule sections. Thus, by removing redundant provisions in Section 25.134<sup>444</sup> and relocating non-redundant provisions to other rule Sections, we are not effecting a substantive change.<sup>445</sup>

192. Specifically, we will remove most of the provisions currently found in Section 25.134, except that the modified text of Section 25.134(g)(4), addressing use of contention protocols, will replace the existing text of Section 25.115(i). Because Section 25.134(h), which prohibits use of remote earth stations that do not cease transmissions when synchronization fails, is an operational requirement rather than a licensing requirement, we will move this rule to Section 25.271. Following deletion of Section 25.134, our proposal to amend the text of Section 25.134(a) to differentiate more clearly the conventional C-band earth station network routine processing requirements is moot.

193. In addition, we will delete the term “CSAT.” Other than in Section 25.134, CSAT appears only in Section 25.115(c)(2).<sup>446</sup> Because the caption of Section 25.115(c)(2) specifies that it pertains to large networks of small antennas operating in the conventional C-band, use of the descriptive adjective “CSAT” in that Section is superfluous.

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<sup>442</sup> See SIA Comments at 14, Appendix B at 36-47, 55-63; see also SIA Reply Comments at 5 n.16. Specifically, SIA proposes to move Section 25.134(e), (f), (g)(4), and (h) into Section 25.115, with modifications to the text proposed in some instances.

<sup>443</sup> See SIA Comments at 13-14. SIA does not identify these regulations.

<sup>444</sup> Section 25.134(e) states that VSAT networks operating in the conventional Ku-band may use more than one hub earth station, and the hubs may be sited at different locations. See 47 C.F.R. § 25.134(e); *Earth Station Streamlining Fifth Report and Order*, 20 FCC Rcd at 5713, ¶ 125. VSAT networks in the conventional Ka-band may also employ multiple hubs at different locations under a single blanket license, pursuant to the general blanket licensing provision for such systems in Section 25.115(e). Accordingly, rather than relocate Section 25.134(e) as proposed by SIA, we remove it and clarify in Section 25.115(c)(1) that applicants for operation of VSAT networks in the conventional Ku-band may specify multiple hubs. In addition, we delete Section 25.134(f) as unnecessary, for the reasons explained below.

<sup>445</sup> Because this change is non-substantive, it does not require prior notice and an opportunity to comment under the Administrative Procedure Act (APA). Section 553(b) of the APA establishes an exception to the notice and comment requirement applicable when the Commission finds good cause for concluding that notice and comment are unnecessary. See 5 U.S.C. § 553(b)(B) (stating that notice and comment procedures do not apply “when the agency for good cause finds (and incorporates the finding and a brief statement for reasons therefore in the rules issued) that notice and public procedures thereon are ... unnecessary”). The “unnecessary” exception to the notice requirement is “confined to those situations in which the administrative rule is a routine determination, insignificant in nature and impact, and inconsequential to the industry and to the public.” *Utility Solid Waste Activities Group v. EPA*, 236 F.3d 749, 755 (D.C. Cir., 2001) (citing *Texaco v. FPC*, 412 F.2d 740, 743 (3<sup>rd</sup> Cir., 1969)); *Sections 2.925 and 2.926 of the Rules Regarding Grantee Codes for Certified Radiofrequency Equipment, Order*, 27 FCC Rcd 6565, 6567, ¶ 8 (2012) (*Grantee Code Order*). “‘Unnecessary’ refers to the issuance of a minor rule or amendment in which the public is not particularly interested.” *Texaco*, 412 F.2d at 743 n.3; *Grantee Code Order*, 27 FCC Rcd at 6567 n.11.

<sup>446</sup> See 47 C.F.R. § 25.115(c)(2).

194. SIA and EchoStar support allowing earth station applicants proposing to operate below a threshold peak EIRP to certify compliance with all applicable Commission rules.<sup>447</sup> EchoStar also suggests the Commission look to the European Commission's example as an approach that has significantly simplified licensing of low-power earth stations.<sup>448</sup> Neither SIA nor EchoStar, however, provide a technical basis for adoption of a separate procedure for "low" EIRP earth stations or suggest standards for a European-style approach.<sup>449</sup>

195. Iridium argues that neither the certification approach for low-EIRP earth station applications nor the European-style standards certification approach in general should apply to blanket-licensed earth station applications proposing to operate in the 29.25-29.5 GHz band, due to the coordination requirements with co-primary NGSO MSS feeder links.<sup>450</sup> AvL expresses concern that an applicant certifying a 50 dBW EIRP limit and operation in compliance with applicable Commission rules may not be sufficient for licensing purposes.<sup>451</sup>

196. We will not adopt, at this time, the alternative licensing procedures SIA proposed for earth stations transmitting with "low" EIRP values. In the *Further Notice*, we requested that commenters advocating adoption of the 50 dBW EIRP proposal provide a supporting technical analysis. No commenter has done so. Accordingly, we lack a sufficient technical record to adopt this alternative approach to routine licensing. We may, however, reconsider this issue in the future if a sufficient technical record is developed at that time.

197. Nor will we adopt a European-style, standards-based licensing approach for VSAT terminals. Under this approach, new earth station models must be tested and declared in conformance with certain technical standards, compliance with which can exempt the operators of such equipment from individual or blanket licensing requirements. No party has provided a detailed proposal on this issue, or described what new standards or procedures would be appropriate. Moreover, under the rules we are adopting today, earth stations may be licensed to operate in the conventional and extended C-band, conventional and extended Ku-band, and conventional Ka-band based on a certification, rather than a technical demonstration, of compliance with routine limits on off-axis antenna gain and input power density. Accordingly, based on the present record, it is unclear what changes would be necessary for the Commission to adopt a standards-based approach, or to what extent such an approach would simplify the authorization of earth stations.

198. Finally, SIA supports our proposal to amend Section 25.220(a) to provide that applications for FSS earth station operation that do not qualify for routine processing under relevant criteria in Sections 25.211, 25.212, or 25.218 must meet the coordination requirements in Section 25.220.<sup>452</sup>

199. We adopt our proposed non-substantive amendment to Section 25.212(h)<sup>453</sup> to simply state that applications for authority for fixed earth station operation in the 5850-6725 MHz,<sup>454</sup> or 14.0-14.5

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<sup>447</sup> See SIA Comments at 14, Appendix B at 36-47, 55-63; EchoStar Reply at 14-15.

<sup>448</sup> EchoStar Reply at 14-15.

<sup>449</sup> Further, in its comments SIA increased its proposed peak EIRP limit from 50 dBW to 60 dBW, but offered no technical rationale for this increase.

<sup>450</sup> See Iridium Comments at 7-8.

<sup>451</sup> See AvL Comments at 3.

<sup>452</sup> See SIA Comments at 14.

<sup>453</sup> We relocate this revised text from Section 25.212(e) to (h) so that it remains at the end of this Section.

<sup>454</sup> Consistent with our decision to extend the routine licensing criteria in Sections 25.218 and 25.212 to earth stations operating in the extended C-band and the extended Ku-band, other than the Appendix 30B bands, we will also include these frequencies in the amended language.



GHz band, that do not qualify for routine processing under relevant criteria in Section 25.211, 25.212, or 25.218 are subject to the requirements in Section 25.220. We note that Section 25.218 does not contain a similar cross-reference to Section 25.220. As a non-substantive amendment to Section 25.218, we will also add the modified text of Section 25.212(h) to Section 25.218 to inform equally parties reviewing that Section.<sup>455</sup>

#### 14. Clarification of the Applicability of Section 25.218

200. We proposed to amend the first paragraph in Section 25.218 to eliminate any possible confusion by explicitly stating that an application for conventional C- or Ku-band VSAT stations not meeting the criteria in Section 25.134 can instead qualify for routine processing by meeting the EIRP density criteria in Section 25.218.<sup>456</sup> Our decision in Section IV.J.13 above, to suppress Section 25.134 renders this clarification unnecessary.<sup>457</sup>

#### 15. Reference Bandwidth in EIRP Density Specifications in Section 25.138

201. In the *Further Notice* we proposed to change the reference bandwidth for the off-axis EIRP density limits in Section 25.138(a) from 40 kHz to 1 MHz.<sup>458</sup> We proposed this change to align these routine envelopes for conventional Ka-band earth stations with the ITU Radio Regulations and to provide more flexibility for applicants, as emission power would consequently be averaged over a larger bandwidth. Both SIA<sup>459</sup> and EchoStar<sup>460</sup> support this proposal, and we received no opposing comments. Thus, we adopt this change to Section 25.138(a) for the reasons noted.

#### 16. Routine Licensing Criteria for Extended C-band Stations

202. *Background.* Our current rules contain no provisions to allow routine licensing of earth stations proposing to operate in extended C-band frequencies. In the *Further Notice*, we proposed to extend the routine licensing criteria for conventional C-band earth stations in Section 25.218 to earth station operations in the extended C-band.<sup>461</sup>

203. *Discussion.* SIA supports inclusion of the extended C-band in Section 25.218.<sup>462</sup> Intelsat opposes extending routine uplink limits based on two-degree spacing to the extended C-band, consistent with its overall opposition to the two-degree spacing policy.<sup>463</sup>

204. We adopt our proposal to amend Section 25.218 to afford routine licensing to earth station operations in the extended C-band, excluding the frequencies subject to the Appendix 30B Plan for the reasons discussed above.<sup>464</sup> Routine licensing criteria will expedite processing of earth station

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<sup>455</sup> Because this rule amendment merely reiterates in Section 25.218 the licensing process available in Section 25.220, we find that notice and comment are “unnecessary” for its adoption under Section 553(b)(A) of the APA. See note 445, *supra*.

<sup>456</sup> See *Further Notice*, 29 FCC Rcd at 12145-46, ¶ 89.

<sup>457</sup> We do, however, amend this Section’s first paragraph to reflect its applicability to extended C-band earth station applicants as a consequence of the changes adopted in Section IV.J.16. below.

<sup>458</sup> See *Further Notice*, 29 FCC Rcd at 12146, ¶ 90.

<sup>459</sup> See SIA Comments at 64.

<sup>460</sup> See EchoStar Comments at 42.

<sup>461</sup> See *Further Notice*, 29 FCC Rcd at 12146, ¶ 91.

<sup>462</sup> See SIA Comments at 15; SIA Reply, Exhibit 3 at 70.

<sup>463</sup> See Intelsat Reply at 8.

<sup>464</sup> See Section IV.F.4., *supra*. Thus, we extend routine licensing to operations in the 5850-5925 MHz, 6425-6700 MHz, and 6700-6725 MHz bands, but exclude the 6725-7025 MHz band incorporated in our proposed definition of “extended C-band.”

applications for these bands, and is consistent with our decision above to adopt routine limits for space station transmissions in the extended C-band. In addition, as a logical outgrowth of our proposal, we will also extend the routine licensing procedures for conventional C-band earth stations in Section 25.212(d) to operations in the extended C-band.<sup>465</sup> This will ensure that the two options available for routine licensing in the conventional C-band—by showing compliance with off-axis EIRP density envelopes or compliance with antenna gain envelopes and an input power density—are also available to operations in the extended C-band.

### 17. Routine Licensing Criteria for Extended Ku-band Stations

205. Above, we adopted an alternative set of routine licensing criteria—antenna gain and input power density levels—for earth station operation in the extended C-band and conventional Ka-band, in which routine licensing is currently only available through compliance with EIRP density limits. Routine licensing of extended Ku-band earth stations is also limited to those applicants demonstrating compliance with EIRP density constraints. To offer the benefits of the alternate path of routine licensing to applicants for extended Ku-band stations, we similarly amend Section 25.212 to incorporate off-axis antenna gain and input power density limits for routine licensing.<sup>466</sup> In light of our decision, above, to exclude bands subject to Appendix 30B of the ITU Radio Regulations from our two-degree spacing requirements, we will exclude those bands from the routine licensing criteria for earth station operation in the extended Ku-band in Sections 25.212 and 25.218.<sup>467</sup>

### 18. Off-Axis Gain Standards for FSS Earth Stations

206. *Background.* In the *Further Notice*, we proposed multiple changes to Section 25.209. In response to a suggestion from SIA, we proposed to amend Section 25.209(a) and (b) to clarify that these provisions also apply to earth stations using FSS frequencies to provide feeder links for non-FSS space stations.<sup>468</sup> We also proposed to add missing text in Section 25.209(a)(2) regarding sidelobe allowances and defining the terms theta and dBi.<sup>469</sup> Because the Commission requires earth station antenna gain to be measured in only two orthogonal planes, we proposed to specify antenna gain envelopes similarly in two orthogonal planes only, *i.e.*, the “plane tangent to the GSO arc” and the “plane perpendicular to the GSO arc,” rather than in other directions.<sup>470</sup>

207. In addition, we proposed to delete Section 25.209(a)(5), which states that an elliptical earth station antenna may be operated only when its major axis is aligned with “the plane of the geostationary satellite orbit as it appears at the particular earth station location” in light of our proposal to require gain and off-axis EIRP density measurements at worst-case skew angles for antennas with axially asymmetric radiation patterns.<sup>471</sup> We also proposed to clarify the rule on protection of FSS earth station

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<sup>465</sup> Adoption of this alternative means of routine licensing for earth station operation in the extended C-band is a logical outgrowth of our proposal to adopt a routine EIRP density envelope for operation in this band, and of our proposal to adopt routine input power density and antenna gain criteria (in addition to the existing EIRP density criteria) for operation in the conventional Ka-band. See *Further Notice*, 29 FCC Rcd at 12143, ¶ 80, 12146, ¶ 91.

<sup>466</sup> This action is a logical outgrowth of our proposal to adopt alternative routine licensing criteria for conventional Ka-band earth stations, as the benefits of such alternative licensing are generally the same in the different bands. See *Further Notice*, 29 FCC Rcd at 12143, ¶ 80 (proposing to adopt the same alternative licensing approach for earth station applicants in the conventional Ka-band that is available to applicants in the conventional C- and Ku-bands, in light of the similar licensing considerations in the different bands).

<sup>467</sup> Thus, we afford routine licensing to earth station operations in the 10.95-11.2 GHz, 11.45-11.7 GHz, and 13.75-14.0 GHz bands, but exclude the 10.7-10.95 GHz, 11.2-11.45 GHz and 12.75-13.25 GHz bands.

<sup>468</sup> *Further Notice*, 29 FCC Rcd at 12146, ¶ 93.

<sup>469</sup> *Id.*, 29 FCC Rcd at 12147, ¶ 96.

<sup>470</sup> *Id.*, 29 FCC Rcd at 12147, ¶ 95.

<sup>471</sup> *Id.*, 29 FCC Rcd at 12147, ¶ 98.

reception in Section 25.209(c)(1),<sup>472</sup> and to delete Section 25.209(e),<sup>473</sup> which would be made redundant by the clarification of Section 25.209(c)(1). Finally, we proposed to replace the word “procedures” with the word “requirements” in Section 25.209(f),<sup>474</sup> and to amend Section 25.209(h) to reflect inadvertently omitted sidelobe exceedance values, as well as to correct minor typographical errors.<sup>475</sup>

208. *Discussion.* SIA supports a number of the changes to Section 25.209 proposed in the *Further Notice*.<sup>476</sup> We adopt our proposals to amend Section 25.209(a) and (b) to make clear that they apply to earth stations that use frequencies allocated to the FSS to provide feeder links for non-FSS space stations. SIA recommends addition of the word “GSO” to describe the earth stations to which these provisions are applicable in Section 25.209.<sup>477</sup> We will incorporate this descriptor in both paragraphs (a) and (b), as we agree it is more precise, however, and consistent with terminology in other rule Sections,<sup>478</sup> we will include it within the phrase “any earth station antenna operating in the FSS and transmitting to a GSO satellite[.]” We will make the proposed changes to Section 25.209(a)(2) using the exceedance values and definitions consistent with our discussion above.<sup>479</sup> We also adopt our proposals to make clarifying amendments to Section 25.209(c)(1) and to eliminate Section 25.209(e), which is made redundant by the change to Section 25.209(c)(1). Finally, we replace the word “procedures” with the word “requirements” in Section 25.209(f) and correct various typographical errors in Section 25.209(h).

209. In addition, consistent with our decision regarding the definitions of “plane tangent to the GSO arc” and “plane perpendicular to the GSO arc,”<sup>480</sup> we adopt our proposal to specify antenna gain envelopes only in two orthogonal planes. Both SIA and EchoStar support the more limited compliance requirement, although they do not fully agree with our proposal on how the required planes are to be defined. Both commenters contend that while the current rules specify that performance be demonstrated along the GSO arc, it is unclear to the manufacturer, testing organization and licensee exactly how to conduct such tests without advance knowledge of the operational use of the antenna. Instead, SIA and EchoStar recommend that the requirement apply in a plane where the beamwidth is the narrowest.<sup>481</sup> We decline to adopt this approach. Requirements for verifying earth station performance are specified in Section 25.132 of our rules, which prescribe, among other things, the azimuth and elevation angular ranges over which the manufacturer must make radiation pattern measurements. These angular ranges are independent of the geostationary orbital arc and require no advance knowledge of the operational use of

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<sup>472</sup> *Id.*, 29 FCC Rcd at 12147-48, ¶ 99. Conforming changes to Section 25.209(c)(2), which currently references paragraph (c)(1), were also proposed.

<sup>473</sup> *Further Notice*, 29 FCC Rcd at 12148, ¶ 100.

<sup>474</sup> *Id.*, 29 FCC Rcd at 12198, Appendix A, ¶ 37.

<sup>475</sup> *Id.*, 29 FCC Rcd at 12148, ¶ 101.

<sup>476</sup> Specifically, SIA agrees with our proposals regarding Section 25.209(c)(1), (c)(2), (f), and (h), although it would change the definition of theta in paragraph (h) consistent with its other proposals, and would use the complementary term “plane orthogonal to the main plane of the antenna” to replace the current phrase “plane perpendicular to the geostationary arc.” SIA also proposes additional minor grammatical changes to Section 25.209(f), as well as changes specifically limiting its applicability to GSO FSS earth stations. Letter from Tom Stroup, President, SIA to Marlene H. Dortch, Secretary, FCC (filed Sept. 17, 2015) (SIA September *Ex Parte*).

<sup>477</sup> SIA Comments, Annex B at 87.

<sup>478</sup> *See, e.g.*, 47 C.F.R. § 25.218(a).

<sup>479</sup> *See* Section IV.J.5., *supra*.

<sup>480</sup> *See* Sections IV.J.3. and IV.J.4., *supra*.

<sup>481</sup> SIA Comments, Appendix B at 57; EchoStar Comments at 43.

the antenna.<sup>482</sup> Unlike the manufacturer, however, we expect that the earth station operator will know *a priori* how the antenna is to be used, and should be able to translate the radiation pattern tests performed by the manufacturer to certify its compliance with the standards of Section 25.209 in the two specified orthogonal planes in the earth station's operating environment.

210. We adopt our proposal to eliminate the current requirement in Section 25.209(a)(5) allowing earth station operation only with the antenna's major axis aligned with the plane of the GSO orbit. O3b supports this modification. However, it expresses concern that this change, in combination with those proposed for Section 25.132, could create ambiguity as to what measurement data are actually required for asymmetric antennas operating with a skew angle.<sup>483</sup> O3b proposes amended text for Section 25.132 to address its concern, which we discuss below.<sup>484</sup> Further to the elimination of this restriction, SIA proposes a new rule in Section 25.209(e) that addresses earth stations operating with asymmetrical antennas but without skew angle adjustment capability. This new rule would specify that in the plane orthogonal to the main plane of the antenna, such earth stations must either demonstrate compliance with the envelopes applicable to co-polarized gain in the plane tangent to the geostationary orbit, or alternatively, in the plane corresponding to the maximum skew angle experienced within the service area of the earth station.<sup>485</sup> Although SIA offers no supporting rationale for this proposal, it is intended, we understand, to take skew angle into account by one of two approaches: either by ensuring that the more restrictive gain requirements applicable in the plane tangent to the GSO arc are met in *both* orthogonal planes (thereby ensuring that they are met at all angles in-between); or, in the alternative, that the gain envelope values specified for the plane tangent to the GSO arc are met in both that plane and in the plane of the worst-case skew angle. We concur with SIA's approach and will adopt this requirement with certain clarifying changes.

211. SIA also suggests that we consolidate the antenna gain envelopes for different bands into a single envelope in Section 25.209(a), using the more permissive elements where the gain envelope is not consistent with the EIRP density envelope for the frequency band.<sup>486</sup> In addition, SIA advocates that the Commission eliminate the cross-polarization requirement in the off-axis gain envelope beyond seven degrees, arguing that its impact in this range is limited.<sup>487</sup> Consistent with our decision above,<sup>488</sup> we adopt SIA's proposal to limit the cross-polarization requirement, and amend Section 25.209 accordingly. We decline, however, to adopt the single off-axis antenna envelope as proposed by SIA. Rather, consequent to our decision to adopt alternative conventional Ka-band and conventional Ku-band off-axis EIRP density envelopes proposed by Kymeta, we are making conforming modifications to the underlying conventional Ku-band and conventional Ka-band off-axis gain envelope specifications in Section 25.209(a) and (b).<sup>489</sup>

212. In addition, SIA proposes that the Commission adopt a new rule in Section 25.209(d) to establish antenna off-axis gain envelopes for certain earth stations operating with primary NGSO FSS

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<sup>482</sup> See Section IV.J.19. below for a discussion of the modifications to Section 25.132(a) and (b) regarding the required angular measurement ranges. In addition, we are requiring that the relevant gain envelope be superimposed on each measured pattern.

<sup>483</sup> O3b Comments at 3-5.

<sup>484</sup> See Section IV.J.19., *infra*.

<sup>485</sup> SIA Reply, Exhibit 3 at 64.

<sup>486</sup> SIA Comments at 15.

<sup>487</sup> *Id.* at 16.

<sup>488</sup> See Section IV.J.6., *supra*.

<sup>489</sup> See Section IV.J.11., *supra*.

satellites.<sup>490</sup> Under SIA's proposal, such earth stations would be required to conform, in two orthogonal planes, to the more relaxed antenna gain envelopes that our rules specify must be met in the plane perpendicular to the GSO arc by GSO FSS earth stations.<sup>491</sup> OneWeb opposes this new rule, arguing that it would negatively impact NGSO FSS user terminal design and operations, is inconsistent with current Part 25 rules (e.g. Section 25.146), and lacks technical foundation.<sup>492</sup> In response, SIA proposes modifications to Section 25.209(f) intended to address OneWeb's concerns by accommodating the possibility of licensing NGSO FSS earth stations that do not cause unacceptable interference under Section 25.209(f).<sup>493</sup>

213. We decline to adopt SIA's proposed new rule in Section 25.209(d), for which it offers no supporting technical rationale. The Commission has not yet determined what off-axis gain envelopes might be appropriate for earth stations operating with NGSO FSS space stations, either to facilitate NGSO-to-NGSO or NGSO-to-GSO interference protection. Moreover, we disagree with SIA that this new rule would clarify requirements for these earth stations, because the Commission has declined to adopt antenna off-axis gain requirements for some NGSO FSS earth stations.<sup>494</sup> We will, however, amend Section 25.209(f) to make it clearer and more concise.

#### **19. Demonstrating Conformance with Limits on Off-Axis Gain and EIRP Density**

214. *Background.* The *Further Notice* proposed multiple changes to Section 25.132. In Section 25.132(b)(1) we proposed to establish a single set of measurement requirements applicable to all frequency bands, and to harmonize these measurement requirements with the gain envelopes specified in Section 25.209 and with the cross-polarization EIRP density envelopes in other rule Sections. Specifically, in Section 25.132(b)(1)(i), we proposed to clarify the range across which co-polarized gain is to be measured in the azimuth plane, and to specify that measurements are to be represented in two plots.<sup>495</sup> We also proposed to re-specify the measurement range for co-polarization gain in the elevation plane, and for cross-polarization gain in both planes.<sup>496</sup> Following these changes, we would expand the scope of Section 25.132(b)(1) to apply its requirements to conventional Ka-band earth stations and delete the now redundant Section 25.138(d). We proposed further to amend Section 25.132(b)(1) to require gain to be measured at the bottom and top of each band assigned for uplink transmission, rather than at the top, bottom and middle of both uplink and downlink frequency bands as currently required.<sup>497</sup> In addition, in

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<sup>490</sup> SIA Comments at 16. SIA would apply this requirement to NGSO FSS earth stations operating on a primary basis, including NGSO FSS earth stations serving as feeder links for non-FSS systems, but would exclude NGSO FSS earth stations subject to paragraph (h) of this rule Section, i.e., Ku-band gateway earth stations.

<sup>491</sup> *Id.*

<sup>492</sup> See Letter from Phillip L. Spector, Counsel for One Web, Ltd., to Marlene H. Dortch, Secretary, FCC (filed July 9, 2015).

<sup>493</sup> SIA September *Ex Parte*. Specifically, SIA proposes to specify that the alternative licensing provisions in Section 25.209(f) apply only to GSO FSS earth stations, as well as introducing other minor grammatical changes.

<sup>494</sup> See *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, ET Docket No. 98-206, 16 FCC Rcd 4096, 4186-87, ¶¶ 238-240 (2000); *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit Fixed Satellite Service in the Ku-Band*, IB Docket No. 01-96, 17 FCC Rcd 7841, 7859, ¶ 60 (2002).

<sup>495</sup> *Further Notice*, 29 FCC Rcd at 12148, ¶ 102. One plot would cover a measurement range across the entire angular range extending  $\pm 180^\circ$  from the main-lobe axis, and the other would cover a smaller range of  $\pm 10^\circ$  from the axis.

<sup>496</sup> *Id.* For co-polarization gain in the elevation plane the range would be 0-30° from beam peak; for cross-polarization measurements in both planes, the range would be across a range of  $\pm 10^\circ$  from beam peak.

<sup>497</sup> *Id.*, 29 FCC Rcd at 12148-9, ¶ 103.



Section 25.132(b)(1)(i) and (ii) we proposed to delete the phrase “in the E- and H-planes for linear-polarized antennas” and in the latter case to specify that cross-polarization gain must be measured in the azimuth and elevation planes. We also proposed to delete, as unnecessary, the statements in Section 25.132(b)(1)(i) and (ii) that gain of circularly polarized antennas must be measured in two orthogonal (*i.e.*, perpendicular) cuts.<sup>498</sup>

215. *Discussion.* These proposed changes to Section 25.132(b)(1) are generally supported by SIA.<sup>499</sup> However, consistent with its proposal to eliminate the cross-polarization requirement in the off-axis gain envelope beyond 7°,<sup>500</sup> it would similarly limit the range across which cross-polarization gain must be measured.<sup>501</sup> AvL also agrees that antenna gain pattern performance is well characterized by measurements at only the lowest and highest frequencies in the assigned operating band.<sup>502</sup> We conclude that these rule changes will clarify the requirements of Section 25.132(b)(1) and better align them with requirements specified in other rule Sections. Accordingly, we adopt these proposed changes to Section 25.132(b)(1), with a modification made to limit the cross-polarization measurement requirement to a range of 7° or less as recommended by SIA, which is consistent with our decision above.<sup>503</sup> AvL also recommends mandating that measurements at intermediate frequencies be made available to, or be placed on file with the Commission,<sup>504</sup> arguing that information from gain measurements made at intermediate frequencies can be of value when calculating an EIRP density or interference protection, as sidelobe peak locations can change rapidly with frequency.<sup>505</sup> We decline to adopt this requirement, as it lacks sufficient specificity (*i.e.*, at which intermediate frequencies, polarizations, and angular ranges) to be enforceable. We note also, that in accordance with Section 25.111(a) of our rules, the Commission has authority to request additional information concerning applications from any party, at any time, and AvL’s concerns may be addressed accordingly.

216. In Section 25.132(b)(1)(iv) we proposed to adopt a new provision that would require the gain of an antenna with an axially asymmetric radiation pattern to be measured at the worst-case skew angle at which the antenna would operate if it would not always be aligned with the plane tangent to the GSO arc.<sup>506</sup> We invited comment as to whether a further requirement should be adopted for measuring the gain patterns of flat-plate antennas.<sup>507</sup> Commenters generally support the Commission’s proposal to include requirements for measurements at the worst-case skew angles for asymmetric antennas,<sup>508</sup> and SIA is further of the view that the current verification requirements are applicable to flat-plate antennas and phased array antennas currently being designed and manufactured.<sup>509</sup> O3b expresses concern that our proposed wording could be interpreted as requiring that the off-axis gain be measured *only* in directions

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<sup>498</sup> *Id.*, 29 FCC Rcd at 12149, ¶¶ 104-05.

<sup>499</sup> Consequential to other SIA proposals, it recommends use of the terms “main plane” and “plane orthogonal to the main pane.”

<sup>500</sup> SIA Comments at 17.

<sup>501</sup> *Id.*

<sup>502</sup> AvL Comments at 3.

<sup>503</sup> *See* Section IV.J.6., *supra*.

<sup>504</sup> AvL Comments at 3.

<sup>505</sup> *Id.* at 3. AvL states that this requirement should not impose an undue burden on the industry since modern antenna test ranges routinely make measurements at multiple intermediate frequencies.

<sup>506</sup> We accordingly proposed to add a definition of “skew angle” in Section 25.103. *See* Section IV.K.6., *infra*.

<sup>507</sup> *Further Notice*, 29 FCC Rcd at 12149, ¶ 106.

<sup>508</sup> SIA Comments at 17; EchoStar Comments at 44; Inmarsat Comments at 5.

<sup>509</sup> SIA Comments at 17.

corresponding to the worst-case skew angle that will be used in practice, when, as it argues, the two sets of orthogonal measurements required in Section 25.132(b)(1)(i)(A) and (B) should still be made for such antennas but with the reference point for the definition of “azimuth” and “elevation” corresponding to the case of maximum skew angle.<sup>510</sup> O3b proposes amended language for this rule which would insert the phrase “in the two orthogonal planes referred to in Sections 25.132(b)(1)(i)(A) and 25.132(b)(1)(i)(B)” to further describe the planes in which measurement are to be made.<sup>511</sup> We concur that our proposed wording might be made clearer. We do not believe, however, that citing “the planes referred to in Section 25.132(b)(1)(i)(A) and 25.132(b)(1)(i)(B)” is entirely accurate either as these rule provisions specify the azimuth and elevation planes respectively. Rather, we will require that for such antennas, measurements be made in two orthogonal planes, with the antenna oriented at the maximum skew angle at which it will operate, and that these measurements be made over the angular ranges, and presented in plots, as specified in Section 25.132(b)(1)(i)(A) and (B).

217. O3b expresses additional concern that useful measured data for flat-plate antennas currently captured by the Commission’s rules will be lost by the proposed changes to Sections 25.209 and 25.132 as such antennas using phased array elements tend to produce their worst-case sidelobes in particular directions that are not necessarily orthogonal to their main axis. Consequently, the measurement of such antennas in two orthogonal planes only, as required by the proposed new Sections 25.209 and 25.132, would likely end up missing some of the worst-case sidelobe levels that occur in other directions.<sup>512</sup> O3b proposes that additional text be included in Section 25.132(b)(1)(iv) requiring applicants to determine the direction or directions in which the worst case sidelobes occur and to provide measured data of the gain in these directions over a range of off-axis angles of  $\pm 90^\circ$ .<sup>513</sup> O3b may be correct in asserting that in the case of phased-array antennas, the requirement to make measurements only in two orthogonal planes may in fact miss some worst-case sidelobes. However, O3b offered no justification for its proposed angular measurement range of  $\pm 90^\circ$  in the direction(s) in which the worst-case sidelobes occur. Moreover, other commenters were not provided sufficient opportunity to discuss either the merits of O3b’s proposal in general, or the feasibility of making such measurements in practice. Because at present the record does not provide sufficient information to adopt O3b’s proposal, we decline to make this change to Section 25.132(b)(1) at this time.

218. Based in part upon our adoption of the new requirement in Section 25.132(b)(1)(iv) as well as a definition of “skew angle,” SIA also urges the Commission to delete as unnecessary, the requirements of Sections 25.221(a)(1)(i)(D), 25.222(a)(1)(i)(D), and 25.226(a)(1)(i)(D) regarding skew angles and the need to align the major axis of the antenna along the GSO arc.<sup>514</sup> SIA argues that the current language in Sections 25.221(a)(1)(i)(A), (B), and (C), 25.222(a)(1)(i)(A), (B), and (C), and 25.226(a)(1)(i)(A), (B), and (C) completely define the off-axis EIRP density limits under any circumstances, and that the requirement contained in paragraphs (a)(1)(i)(D) in each of these rule Sections is redundant.<sup>515</sup> Moreover, SIA asserts that this language could be interpreted in a manner that would disfavor innovative approaches to EIRP spectral density management, and notes the omission of this requirement from the

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<sup>510</sup> O3b Reply at 3-4.

<sup>511</sup> *Id.* at 4.

<sup>512</sup> *Id.* at 4-5.

<sup>513</sup> *Id.*

<sup>514</sup> SIA Comments at 18. In Section 25.221(a)(1)(D) this requirement for C-band ESVs states that for non-circular ESV antennas, the major axis of the antenna will be aligned with the tangent to the arc of the GSO at the orbital location of the target satellite, to the extent required to meet the specified off-axis EIRP spectral-density criteria. Analogous requirements are specified in Sections 25.222(a)(1)(D) and 25.226(a)(1)(D) for Ku-band ESVs and VMESs, respectively.

<sup>515</sup> *Id.*

similar, but newer rule Section 25.227 addressing ESAAs.<sup>516</sup> No commenters objected to SIA's proposal. We concur with SIA's assessment that off-axis EIRP density requirements are fully defined in previous paragraphs of these rule Sections and that the additional requirements in Sections 25.221(a)(1)(i)(D), 25.222(a)(1)(i)(D), and 25.226(a)(1)(i)(D) are unnecessary. Our adoption of the new measurement requirement in Section 25.132(b)(1)(iv) for axially asymmetric antennas further ensures that such antennas will be capable of meeting these off-axis EIRP density requirements at the worst-case skew angles with which they will operate. Accordingly, we delete these rule Sections as requested by SIA.

219. Commenters concur with our proposal to delete the second sentence in Section 25.132(b)(2)<sup>517</sup> as vague and unnecessary,<sup>518</sup> and we delete it accordingly.

220. Rather than requiring applicants to specify off-axis EIRP density in tables, we proposed to amend our rules to require them to file off-axis EIRP density charts with relevant routine envelopes superimposed, and to provide supplemental data in tabular form in order to demonstrate eligibility for routine licensing under EIRP density criteria in various other rule Sections.<sup>519</sup> Specifically, we proposed to require applicants to provide charts specifying EIRP density calculated based on measurement pursuant to Section 25.132(b)(1), in both orthogonal planes, with the relevant routine envelopes superimposed. We proposed to require submission of two charts for co-polarized EIRP density in the plane tangent to the GSO arc: one covering the range of off-axis angles from 0° to ±10° and another covering the range from 0° to ±180° off-axis.<sup>520</sup> In addition, our proposed rules included requirements to provide plots of maximum cross-polarized EIRP density in the planes tangent to, and perpendicular to, the GSO arc at off-axis angles from 0° to ±10°.<sup>521</sup> Further, we proposed to require applicants to provide a supplemental table for each off-axis angular range in which the routine EIRP density envelope is exceeded, specifying angular coordinates in degrees off-axis and corresponding calculated off-axis EIRP density at 0.2° increments over the angular range in which the routine envelope is exceeded and one degree on each side of that range.<sup>522</sup> We proposed to incorporate these requirements in Section 25.115(g)(1) and to delete inconsistent or redundant requirements in Sections 25.115(g), 25.220(b), 25.221(b), 25.222(b), 25.226(b), and 25.227(b).<sup>523</sup>

221. EchoStar supports these proposed new presentation rules and the uniform application of requirements for off-axis gain measurements or off-axis EIRP densities throughout our rules.<sup>524</sup> SIA agrees that it is easier to review off-axis EIRP density specifications when in a graphical format and supports the proposed revisions to Section 25.115(g)(1), but would include its preferred terms specifying the "local plane of the GSO arc" and the "plane orthogonal to the local plane of the GSO arc."<sup>525</sup> We will

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<sup>516</sup> *Id.*

<sup>517</sup> *Further Notice*, 29 FCC Rcd at 12149, ¶ 107. This sentence states that "[t]he minimum tests specified above are recognized as representative of the performance of the antenna in most planes although some increase in sidelobe levels should be expected in the spar planes and orthogonal spar planes."

<sup>518</sup> SIA Comments at 18.

<sup>519</sup> *See, e.g.*, 47 C.F.R. §§ 25.138, 25.218, 25.221, 25.222, 25.223, 25.226, 25.227.

<sup>520</sup> *Further Notice*, 29 FCC Rcd at 12150, ¶ 109. This requirement to file off-axis EIRP density charts would not apply to applicants that certify conformance with antenna gain standards pursuant to Section 25.132(a)(1) and certify that input power density will not exceed the relevant limit in Section 25.134, 25.211, or 25.212.

<sup>521</sup> *Id.*, 29 FCC Rcd at 12181-83, Appendix A (Section 25.115(g)).

<sup>522</sup> *Id.*, 29 FCC Rcd at 12150, ¶ 109.

<sup>523</sup> *Id.*

<sup>524</sup> EchoStar Comments at 44.

<sup>525</sup> SIA Comments at 19. Consistent with its proposals in other rule Sections, SIA also recommends that the cross-polarized measurement range be limited to ±7° off-axis.

adopt these changes, and consistent with decisions above, we will retain the phrases “plane tangent to the GSO arc” and “plane perpendicular to the GSO arc.”<sup>526</sup> SIA further supports the deletion of redundant provisions in Sections 25.115(g), 25.220(b), 25.221(b), 25.222(b), 25.226(b), and 25.227(b), which we will make.<sup>527</sup>

222. Consequent to our proposal to require earth station applicants to demonstrate conformance with off-axis EIRP density envelopes in various rule Sections calculated from gain measurement rather than specifying gain patterns,<sup>528</sup> we proposed to delete Section 25.132(b)(3)<sup>529</sup> and to amend Section 25.132(a)(2) to state, instead, that applicants that specify off-axis EIRP density pursuant to requirements in Section 25.115(g)(1) are not subject to the certification requirement in Section 25.132(a)(1) and need not submit antenna gain patterns.<sup>530</sup> SIA agrees that Section 25.132(b)(3) should be deleted, and it also agrees with the proposed changes to our information submission requirements,<sup>531</sup> which we will adopt.

223. Finally, to eliminate various disparities in our rules regarding information requirements for applicants that rely on coordination with potentially affected satellite operators in lieu of demonstrating conformance with routine licensing criteria, we proposed to require all such applicants to specify off-axis EIRP density pursuant to the proposed requirements in Section 25.115(g)(1) rather than provide gain patterns.<sup>532</sup> Commenters generally supported this proposal<sup>533</sup> and we received no opposition. Accordingly, we will amend our rules as proposed.

## 20. Coordination Requirements for Non-Routine Earth Station Operation

224. In the *Further Notice*, we proposed to replace VSAT-specific provisions in Section 25.134 regarding non-routine earth station operations with a general provision in Section 25.220 stating, among other things, that applicants for fixed earth station licenses in the conventional C-band or conventional Ku-band that do not qualify for routine processing under relevant criteria in Section 25.134, 25.211, 25.212, or 25.218 must meet the coordination requirements in Section 25.220.<sup>534</sup> We further proposed to amend Section 25.220 to expand its scope to applications for, and operation of, conventional Ka-band earth stations that do not meet the off-axis EIRP density criteria in Section 25.138(a), and to delete separate coordination rules in Section 25.138(b) and (c).<sup>535</sup> We also proposed to delete Section 25.220(a)(2), as we believed the cross-reference to Section 25.154 to be unnecessary.<sup>536</sup> SIA agrees with

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<sup>526</sup> We note that the proposed text in Section 25.115(g)(1)(ii) incorrectly specified *cross*-polarized EIRP density, instead of *co*-polarized EIRP density. We correct this in the adopted Section 25.115(g)(1)(ii). See Appendix B, *infra*.

<sup>527</sup> SIA Comments at 19.

<sup>528</sup> *Further Notice*, 29 FCC Rcd at 12150, ¶ 109.

<sup>529</sup> Section 25.132(b)(3) currently states that applicants seeking authority to operate FSS earth stations pursuant to the requirements in Section 25.218, 25.220, 25.221, 25.222, 25.223, 25.226, or 25.227 must submit a copy of the manufacturer’s range test plots of the gain patterns of antennas less than three feet in diameter. 47 C.F.R. § 25.132(b)(3).

<sup>530</sup> *Further Notice*, 29 FCC Rcd at 12150, ¶ 108.

<sup>531</sup> SIA Comments at 18-19.

<sup>532</sup> *Further Notice*, 29 FCC Rcd at 12150, ¶ 111. We also adopt conforming changes in Sections 25.220, 25.221, 25.222, 25.226 and 25.227.

<sup>533</sup> SIA Comments at 17; EchoStar Comments at 44; Inmarsat Comments at 5.

<sup>534</sup> *Further Notice*, 29 FCC Rcd at 12144-45, ¶ 85.

<sup>535</sup> *Id.*

<sup>536</sup> *Id.*, 29 FCC Rcd at 12152, ¶ 116.

these proposals,<sup>537</sup> and we received no objections. We believe that these changes will eliminate redundancy and make our rules more clear. Accordingly we adopt these changes.<sup>538</sup>

225. The *Further Notice* also proposed to delete Section 25.220(d)(1)(i) as unnecessary, since protection for non-routine operation is sufficiently addressed in the initial paragraph of Section 25.220(d)(1) and since Section 25.220(d)(1)(ii) requires submission of a statement from the satellite operator that it has coordinated the proposed operation with the operators of all adjacent satellites within six degrees. EchoStar and SIA support this proposal,<sup>539</sup> and no commenters object. Accordingly, we delete Section 25.220(d)(1)(i).

226. For clarification, we proposed to amend Section 25.220(d)(2) to state that the operator of an earth station licensed pursuant to Section 25.220 must reduce power as necessary to conform to relevant routine limits on off-axis EIRP density in the direction of a future two-degree compliant satellite receiving in the same uplink band at a location within six degrees of the target satellite, unless the non-routine earth station operation has been coordinated with the operator of that satellite.<sup>540</sup> At the suggestion of SIA, we further proposed to amend Section 25.220(d)(2) to require an operator of a non-routine earth station to reduce EIRP density toward a co-frequency space station more than six degrees away from the target satellite, to levels within relevant routine limits if operation of the co-frequency space station is adversely affected by emissions from the non-routine earth station and the non-routine operation is not permitted under the terms of a coordination agreement with the operator of that satellite.<sup>541</sup> We also proposed to include an analogous rule in Section 25.223(d) addressing non-routine 17/24 GHz BSS feeder link stations.<sup>542</sup>

227. EchoStar supports both of these amendments to Section 25.220(d)(2), noting that while rare, it is important that interference be taken into account in instances of non-compliance beyond six degrees.<sup>543</sup> ViaSat urges the Commission to continue to require non-routine operations to be curtailed to protect subsequently launched systems unless the subsequent system operator consents to the non-routine operations.<sup>544</sup> In contrast, and consistent with its overall opposition to the two-degree spacing policy, Intelsat objects to the revisions to Section 25.220(d), which it argues, merely codifies the existing policy for uplink transmissions and fails to address what it asserts to be shortcomings with the two-degree spacing policy in general.<sup>545</sup>

228. We will amend Section 25.220(d)(2) with the language proposed in the *Further Notice* and include an exception for continuing transmissions pursuant to the modified two-degree spacing policy

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<sup>537</sup> SIA Comments at 14, Annex B at 115. Consistent with its other proposals, SIA supports use of the term “conventional GSO Ka-band.”

<sup>538</sup> We will omit the reference to Section 25.134 consistent with our decision above to delete this Section in its entirety. See Section IV.J.13., *supra*.

<sup>539</sup> EchoStar Comments at 44; SIA Comments, Annex B at 115.

<sup>540</sup> *Further Notice*, 29 FCC Rcd at 12151, ¶ 115.

<sup>541</sup> *Further Notice*, 29 FCC Rcd at 12151, ¶ 116. SIA recommended similar amendments to Section 25.138(c), however, we address these instead by expanding the scope of Section 25.220 to apply to applications for, and operation of, conventional Ka-band earth stations that do not meet the off-axis EIRP density criteria in Section 25.138(a).

<sup>542</sup> *Id.* For non-routine 17/24 GHz BSS feeder-link earth stations, the angular separation over which coordination is required may vary. Our current rule specifies 6° for EIRP density excesses of up to 3 dB, and 10° for EIRP density excesses greater than 3 dB but no more than 6 dB. 47 C.F.R. § 25.223(c).

<sup>543</sup> EchoStar Comments at 45.

<sup>544</sup> ViaSat Reply at 7.

<sup>545</sup> Intelsat Comments at 25.



discussed above.<sup>546</sup> We believe these changes provide additional clarity and offer a remedy for potential interference scenarios not currently addressed in the rule. In addition, we will adopt the proposed changes to Section 25.223(d) with regard to non-routine 17/24 GHz BSS feeder link stations in order to protect operators adversely affected by uplink transmissions in excess of routine levels.<sup>547</sup>

229. In response to a recommendation from SIA, we proposed to include an exception in the coordination rule Section 25.223(c) analogous to the one in Section 25.220(d)(4), that would allow an applicant to omit certification of coordination with the operator of a co-frequency satellite if off-axis EIRP density from the proposed earth station(s) would not exceed routine levels toward any point on the geostationary arc within one degree of the co-frequency satellite's assigned location.<sup>548</sup> SIA concurs with our proposal,<sup>549</sup> as does EchoStar, which argues that such a change would significantly simplify the process of obtaining an authorization by eliminating the need to obtain coordination agreements from other operators with which the operator's performance is compliant.<sup>550</sup> Accordingly, we will amend Section 25.223(c) as proposed. SIA also proposes inclusion of analogous provisions in Section 25.138(b) and (c). However, this need was obviated by our extension of the applicability of coordination rules in Section 25.220(d) to conventional Ka-band earth stations, which SIA supports.<sup>551</sup>

230. Finally, we proposed to amend Section 25.220 to extend its applicability to earth stations on mobile platforms and to delete redundant or inconsistent coordination rules in Sections 25.221, 25.222, 25.226, and 25.227, which apply to earth stations on mobile platforms.<sup>552</sup> SIA supports this proposal,<sup>553</sup> and no commenters express objections. Accordingly, we amend Section 25.220 as proposed, and delete the redundant rule provisions in Sections 25.221, 25.222, 25.226, and 25.227.

## 21. Other Proposed Changes in Licensing Rules for Earth Stations on Vessels, Vehicle Mounted Earth Stations, and Earth Stations Aboard Aircraft

231. In the *Further Notice*, we proposed to delete as redundant, the final sentences in paragraph (a)(3) and (a)(3)(i) in Sections 25.221, 25.222, 25.226, and 25.227, which call attention to the requirements of paragraph (b)(3) in each of these rule Sections.<sup>554</sup> We also proposed to delete the final sentence in paragraph (a)(3)(ii) in Sections 25.226 and 25.227, which is redundant with provisions in paragraph (b)(3) in those rule Sections.<sup>555</sup> SIA supports these deletions<sup>556</sup> and no commenter opposed them. Accordingly, we will amend these rule Sections as proposed.<sup>557</sup>

<sup>546</sup> See Section IV.F.3, *supra*.

<sup>547</sup> In Section 25.223(d), we will specify the requirement to be applicable over the angular separation values specified in paragraph (c)(1) of that Section. Section 25.223(c)(1) specifies varying angular separations over which the non-routine earth station operator must coordinate depending upon the level of EIRP density exceedance.

<sup>548</sup> *Further Notice*, 29 FCC Rcd at 12151-52, ¶¶ 116-17.

<sup>549</sup> SIA Comments, Annex B at 143.

<sup>550</sup> EchoStar Comments at 45.

<sup>551</sup> SIA Comments at 19.

<sup>552</sup> *Further Notice*, 29 FCC Rcd at 12152, ¶ 118.

<sup>553</sup> SIA Comments, Annex B at 82.

<sup>554</sup> *Further Notice*, 29 FCC Rcd at 12152, ¶¶ 119, 12207, 12210, 12214-15, 12217.

<sup>555</sup> *Id.*, 29 FCC Rcd at 12152, ¶ 119.

<sup>556</sup> SIA Comments at 19.

<sup>557</sup> In addition, we shorten the headings for these rule Sections without changing their meaning. These changes are non-substantive and inconsequential and, therefore, fall under the "unnecessary" exception to the notice and comment requirement of the APA. See note 445, *supra*.

232. Consistent with analogous changes we proposed to the definition of N in various earth station routine licensing rules,<sup>558</sup> we proposed to change the phrase “simultaneously transmitting co-frequency ... earth stations in the same satellite receiving beam” in paragraph (a)(3) in Sections 25.221, 25.222, 25.226, and 25.227 to “earth stations transmitting simultaneously in the same frequencies to the same target satellite.”<sup>559</sup> SIA does not support these changes consistent with its general opposition to our proposed re-definition of N and the “1 dB formula.” Instead, it recommends an alternate approach to addressing aggregate EIRP density in each of these rule Sections,<sup>560</sup> and proposes instead that in subparagraph (a)(3)(i) we delete reference to N and the “1 dB formula,” and specify that the off-axis EIRP density will be aggregated only in the receive beam of the satellite carrying the traffic (*i.e.*, the interfering satellite).<sup>561</sup>

233. As discussed above, we are not adopting our proposed new definition of N and instead will delete references to N and to the “1 dB formula” from our rules.<sup>562</sup> In addition, we have decided to retain our current approach to determining aggregate off-axis EIRP density, whereby it is summed only over transmissions from the co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam. We find SIA’s proposed amendments to be consistent with this approach and adopt its proposed changes to paragraphs (a)(3)(i) in Sections 25.221, 25.222, 25.226 and 25.227.<sup>563</sup>

#### **K. Section 25.103 “Definitions”**

234. In this Section we revise the list of defined terms in Section 25.103 to make them clearer and more convenient to use.

##### **1. “20/30 GHz bands”**

235. *Background.* The term “20/30 GHz bands” is currently defined as the 18.3-20.2 GHz and 28.35-30.0 GHz bands, which are allocated for use by the FSS. The Commission has designated certain portions of these bands as primary for GSO FSS operation, and other portions as primary for NGSO FSS operation, MSS feeder-link operation, and/or terrestrial operation. Applications for GSO FSS earth station operation in the bands designated as primary for such operation—18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space)—may qualify for routine licensing under Section 25.138. In view of this, and in the interest of convenience, we proposed to revise the definition of “20/30 GHz bands” to refer only to the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30.0 GHz bands.<sup>564</sup> As a consequence of this proposal, we also proposed to replace the term “20/30 GHz” where currently used in Section 25.209 with a specification of the frequency bands mentioned in the current definition.

236. *Discussion.* SIA and Iridium support our proposal to limit this definition to the bands designated as primary for GSO FSS operation.<sup>565</sup> They suggest, however, that “conventional GSO Ka-bands” would be a more accurate title for this definition than “20/30 GHz bands.”<sup>566</sup> SIA recommends the

<sup>558</sup> *Further Notice*, 29 FCC Rcd at 12139, ¶¶ 67-68.

<sup>559</sup> *Id.*, 29 FCC Rcd at 12152, ¶ 120.

<sup>560</sup> SIA Comments at 19-20, Annex 1 at 88, 96, 107, 118. SIA also proposes analogous changes to Sections 25.138 and 25.218. *See* Section IV.J.7., *supra*.

<sup>561</sup> SIA Comments at 19-20, Annex 1 at 88, 96, 107, 118.

<sup>562</sup> *See* Section IV.J.7., *supra*.

<sup>563</sup> We also adopt the analogous changes to Section 25.138(a)(5) and to Section 25.218(d)(3), (f)(3) and (h)(3). *See* Section IV.J.7., *supra*.

<sup>564</sup> *See Further Notice*, 29 FCC Rcd at 12152, ¶ 121.

<sup>565</sup> *See* SIA Reply, Annex B at 1; Iridium Comments at 8-9.

<sup>566</sup> The term “Ka-band” generally refers to the 17.7-20.2 GHz and 27.5-30.0 GHz frequency bands.

term “conventional NGSO Ka-bands” as a counterpart, to signify the 18.8-19.1 GHz and 28.6-29.1 GHz bands where NGSO FSS operations are designated as primary.<sup>567</sup> In addition, Iridium contends that the term should be further limited to GSO FSS earth stations that operate in the specified bands, and suggests developing separate definitions for NGSO FSS and NGSO MSS feeder links. SIA also recommends using the narrower definition in the antenna performance standards in Section 25.209, rather than specifying the bands in the current definition.<sup>568</sup>

237. In contrast, EchoStar advocates expanding the current definition of “20/30 GHz bands” to include the 27.5-28.35 GHz band. This band is allocated for FSS operation on a co-primary basis with terrestrial services, but has been designated by the Commission for secondary use by the FSS.<sup>569</sup> EchoStar argues that this definitional change would ensure that two-degree spacing rules are applied to GSO FSS operations in any portion of the 18.3-20.2 GHz and 27.5-30.0 GHz bands, regardless of their status, and thereby facilitate sharing among GSO FSS systems. Iridium opposes EchoStar’s proposal.<sup>570</sup> Iridium argues that applications for secondary or non-conforming operation should be evaluated case-by-case and not under service and technical rules adopted for primary services.

238. After considering the record, we adopt our proposal to limit this definition to the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30.0 GHz bands designated for primary GSO FSS use. We believe that a definition specific to these GSO FSS primary bands will prove clearer and more useful in our rules. We decline EchoStar’s recommendation to expand the definition to the 18.3-20.2 GHz and 27.5-30.0 GHz bands in order to apply the two-degree spacing rules in Section 25.138 to applications for GSO FSS earth station operation on a secondary or non-conforming basis. The *Further Notice* did not propose an expansion of the two-degree spacing policy to such secondary or non-conforming GSO FSS operations, which are not subject to routine licensing under Section 25.138 and which may require waivers of the Commission’s Ka-band Plan or the Table of Frequency Allocations.<sup>571</sup> Moreover, EchoStar does not fully address what additional amendments to Section 25.138 would be necessary or appropriate to accommodate applications for secondary or non-routine use.<sup>572</sup> Based on this record, we decline to broaden the scope of applications eligible for processing under Section 25.138.

239. We will use the term “conventional Ka-band,” instead of the term “20/30 GHz bands,” for parallelism with other “conventional” bands and because we believe this term is more indicative of the GSO FSS primary bands it represents. In keeping with our definitions of other frequency bands allocated to the FSS,<sup>573</sup> we will not limit “conventional GSO Ka-bands” to GSO FSS earth station operation, as Iridium proposes. Rather, we will indicate in context which service and type of operation applies. Because SIA proposes to use the additional term “conventional NGSO FSS Ka-bands” in only one rule section, we are not convinced that its definition is necessary in Part 25 or that its use would be clearer or more convenient than simply stating the relevant frequency bands. We, therefore, decline to add this defined term.<sup>574</sup> We also decline, at this time, to adopt definitions of NGSO FSS feeder links and NGSO

<sup>567</sup> SIA Reply at 7.

<sup>568</sup> See SIA Reply, Annex B at 57.

<sup>569</sup> See 47 C.F.R. § 2.106; *28 GHz First Report and Order*, 11 FCC Rcd at 19025, ¶ 45.

<sup>570</sup> Iridium Reply at 6-7.

<sup>571</sup> Footnote NG165 of the U.S. Table of Frequency Allocations, for example, limits FSS use of the 18.8-19.3 GHz band to NGSO systems. See 47 C.F.R. § 2.106, footnote NG165.

<sup>572</sup> For example, unlike applications under Section 25.138, applications for secondary GSO FSS operation must include a technical demonstration that the applicant can operate on a non-harmful interference basis to the service designated as primary. *28 GHz Third Report and Order*, 12 FCC Rcd at 22325-66, ¶ 39.

<sup>573</sup> See, e.g., Appendix B, *infra* (defining the conventional Ku-band as the 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) FSS frequency bands).

<sup>574</sup> SIA Reply, Exhibit 3 at 14-15.

MSS feeder links, as Iridium proposes. Defining these terms was not contemplated by the *Further Notice*, and we have not received comment from Iridium or any other party as to what appropriate definitional text would be. Finally, we adopt our proposal to replace the term “20/30 GHz” where currently used in Section 25.209 with a specification of the frequency bands mentioned in the current definition.

**2. “Conventional C-band” “Extended C-band” “Conventional Ku-band” “Extended Ku-band”**

240. *Background.* In connection with the possible application of two-degree spacing criteria to operations in the extended C-band, we proposed to define the terms “conventional C-band” and “extended C-band” in Section 25.103, delete the definition of the term “C-band,” and replace “C-band” and the equivalent “4/6 GHz bands” with “conventional C-band.”<sup>575</sup> The proposed definition of “extended C-band” in Appendix A of the *Further Notice* specified the 3600-3700 MHz (space-to-Earth), 5850-5925 MHz (Earth-to-space), 6425-6700 (Earth-to-space), and 6700-7025 MHz (bi-directional)<sup>576</sup> FSS bands.<sup>577</sup> A portion of these frequencies, 6725-7025 MHz (Earth-to-space), is subject to the international plan for FSS under Appendix 30B of the ITU Radio Regulations.<sup>578</sup>

241. We also proposed to define “conventional Ku-band” and to use it in place of its less-common synonym, “12/14 GHz bands.” We did not specifically propose to alter the definition of “extended Ku-band” in Section 25.103, which specifies the 10.7-11.7 GHz (space-to-Earth), 12.75-13.25 GHz (Earth-to-space), and 13.75-14.0 GHz (Earth-to-space) FSS bands.<sup>579</sup> Included in this definition are the 10.70-10.95 GHz, 11.20-11.45 GHz, and 12.75-13.25 GHz bands also subject to the Appendix 30B FSS plan.

242. *Discussion.* SIA supports our proposal to define “conventional C-band” and “conventional Ku-band” and to use them in place of synonyms in Part 25.<sup>580</sup> SES notes that the proposed rule text defining the “extended C-band” omits the Appendix 30B downlink band, 4500-4800 MHz, associated with the 6725-7025 MHz uplink band and recommends including this downlink band as well.<sup>581</sup>

243. We adopt our proposals concerning the “conventional C-band” and “conventional Ku-band,” which should make our terminology clearer and more consistent. We adopt a modified definition of “extended C-band” to remove the 6725-7025 MHz planned band,<sup>582</sup> and decline SES’s suggestion to add the additional planned band 4500-4800 MHz. Above, we concluded that the public interest would not be served by including bands subject to Appendix 30B within our two-degree spacing rules.<sup>583</sup>

<sup>575</sup> *Further Notice*, 29 FCC Rcd at 12152, ¶ 121.

<sup>576</sup> The space-to-Earth allocation to the FSS in this band is limited to NGSO MSS feeder links. *See* 47 C.F.R. § 2.106, footnote 5.458B.

<sup>577</sup> *Further Notice*, 29 FCC Rcd at 12178, Appendix A, ¶ 4.

<sup>578</sup> *See* note 10, *supra*.

<sup>579</sup> *See 2013 Report and Order*, 28 FCC Rcd at 12412, ¶ 17 (relocating the definition of “extended Ku-band” from Section 25.218(b) to Section 25.103); *Earth Station Eighth Report and Order*, 23 FCC Rcd at 15155, Appendix B, ¶ 7 (adopting the definition of “extended Ku-band” in Section 25.218).

<sup>580</sup> *See, e.g.*, SIA Reply, Exhibit 3 at 1-2.

<sup>581</sup> *See* SES Comments at 6 n.18.

<sup>582</sup> In addition, given our proposed use of the term in Part 25, we limit the 6700-6725 MHz band in “extended C-band” to the Earth-to-space direction, as only this direction is allocated for GSO FSS operation. *See* note 576, *supra*.

<sup>583</sup> *See* Section IV.F.4., *supra*.

Consistently, we exclude planned bands from the term “conventional C-band,” which will make it more useful in Part 25. For the same reason, we redefine the term “extended Ku-band” as the 10.95-11.2 GHz, 11.45-11.7 GHz, and 13.75-14.0 GHz bands, without the planned bands incorporated in the current definition.

### 3. “NGSO FSS gateway earth station”

244. *Background.* The definition of “NGSO FSS gateway earth station” includes provisions relating to coordination with terrestrial services. In the *Further Notice*, we proposed to move these provisions to a new sub-paragraph in Section 25.203(c), which prescribes requirements for coordinating earth stations with terrestrial stations in shared frequency bands.<sup>584</sup> The remaining definition of “NGSO FSS gateway earth station,” as proposed, specifies an earth station supporting routing and switching functions that does not originate or terminate traffic, but interconnects multiple user-operated earth stations operating in other frequency bands with primary terrestrial networks, such as the public switched telephone network and Internet networks.<sup>585</sup>

245. *Discussion.* SIA supports relocating the provisions related to terrestrial coordination to Section 25.203(c).<sup>586</sup> It argues, however, that the remaining definition is overly narrow and does not include all Ka-band NGSO FSS gateway operations of its member, O3b.<sup>587</sup> SIA suggests revisions to the proposed definition to reflect that NGSO FSS gateways may operate in the same bands as non-gateway stations in the same system, may interconnect earth stations operated by the space station operator or by its customers, and may connect to public as well as private networks.

246. We adopt our proposal to move coordination-related text from the definition of “NGSO FSS gateway earth station” to Section 25.203(c). We also adopt modified text for the remaining definition to reflect the gateway operations contemplated by SIA.<sup>588</sup> We believe this general definition, as revised, is clearer and better reflective of NGSO FSS gateway operations and its use will improve the efficiency of licensing of such stations.<sup>589</sup>

### 4. “Permitted Space Station List”

247. *Background.* The “Permitted Space Station List” is a point of communication<sup>590</sup> available to routinely licensed earth stations. An earth station authorized to communicate with the “Permitted List” may access any U.S.-licensed GSO space station providing FSS in the conventional C-band, conventional Ku-band, or conventional Ka-band and any non-U.S. licensed GSO FSS space station granted inclusion on the Permitted List in these bands, provided that the operation is otherwise consistent with the earth station license and the space station grant. In the *Further Notice*, we invited comment on a recommendation made earlier in this proceeding to expand the definition of the Permitted Space Station List to include all U.S.-licensed GSO space stations providing FSS to U.S. earth stations in any frequency

<sup>584</sup> *Further Notice*, 29 FCC Rcd at 12153, ¶ 124.

<sup>585</sup> See *Further Notice*, 29 FCC Rcd at 12178, Appendix A, ¶ 4. The substance of the definition was adopted in the context of NGSO FSS gateway operations in the 10.7-14.5 GHz frequency range. See *Amendment of Parts 2 and 25 of the Commission’s Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, First Report and Order and Further Notice of Proposed Rule Making, ET Docket No. 98-206, 16 FCC Rcd 4096, 4111-12, ¶¶ 29-31 (2000), Second Memorandum Opinion and Order, 18 FCC Rcd 2324, 2335, ¶ 25 (2003); see also *2013 Report and Order*, 28 FCC Rcd 12408, ¶ 7 n.12 (adopting non-substantive amendments to the definition).

<sup>586</sup> See SIA Reply, Exhibit 3 at 51.

<sup>587</sup> See SIA Reply at 7-8.

<sup>588</sup> See Appendix B, *infra*.

<sup>589</sup> See *Further Notice*, 29 FCC Rcd at 12119, ¶ 4.

<sup>590</sup> An earth station “point of communication” is the space station with which it operates.



band and every non-U.S. licensed GSO FSS space station that the Commission has authorized a U.S. earth station to communicate with in any frequency band.<sup>591</sup>

248. *Discussion.* SES and EchoStar support expansion of the Permitted List to include all authorized GSO FSS space stations.<sup>592</sup> They assert that an expanded Permitted List would simplify the earth station licensing process and relieve earth station operators of the obligation to modify their licenses when GSO space stations in the additional bands are relocated or replaced. Intelsat objects to expanding the Permitted List to include the extended C-band and extended Ku-band due to the more extensive coordination requirements in those bands.<sup>593</sup> SES also recommends that a separate Permitted List be created for NGSO FSS operations to provide a consolidated reference point for such systems authorized to serve the United States.<sup>594</sup> In addition, SES contends that the expanded Permitted List should include non-U.S. licensed space stations that have been granted market access through any of the available market access mechanisms—petition for declaratory ruling, “Letter of Intent,” or earth station license application—rather than solely through a petition for declaratory ruling, as today.<sup>595</sup>

249. We expand the definition of the Permitted Space Station List to include all GSO FSS space stations licensed or granted U.S. market access in bands where we will have routine licensing criteria for earth stations, *i.e.*, the extended and conventional C-bands, the extended and conventional Ku-bands, the conventional Ka-band, and the 24.75-25.25 GHz band.<sup>596</sup> The Commission has historically limited the Permitted List to bands in which it had developed routine licensing criteria.<sup>597</sup> Earth stations conforming to routine parameters in those bands may operate without prior coordination between adjacent space station operators.<sup>598</sup> Accordingly, antenna repointing to a different space station on the Permitted List, within any “coordinated arc” of antenna pointing agreed upon by co-equal terrestrial users, should not cause harmful interference and need not be specifically approved by the Commission. Further, because we retain the ability to address any terrestrial coordination issues in the individual earth station license, we disagree with Intelsat that such considerations preclude inclusion of additional bands in the Permitted List. However, we do not have similar routine licensing standards in other FSS frequency bands or for NGSO FSS operation at this time. It is therefore premature to expand or create an additional Permitted List for such operation. We note, however, that the online list of all authorized space stations that will be created will serve a similar informational function to the current online Permitted List.<sup>599</sup>

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<sup>591</sup> See *Further Notice*, 29 FCC Rcd at 12153-54, ¶ 126.

<sup>592</sup> See SES Comments at 17-18; SES Reply at 14-15; EchoStar Comments at 46-47; see also EchoStar Reply, Appendix A at 1.

<sup>593</sup> Intelsat Comments at 30.

<sup>594</sup> SES Comments at 18.

<sup>595</sup> *Id.* at 17. EchoStar concurs that parties granted market access through a “Letter of Intent” filing should be included in the Permitted List. EchoStar Comments at 47.

<sup>596</sup> See 47 C.F.R. §§ 25.138, 25.211, 25.212, 25.218, 25.221(a), 25.223(b), 25.222(a), 25.226(a), 25.227(a). Under the modified criteria we adopt here, routine limits on space station transmissions will no longer be included in the requirements for routine earth station licensing.

<sup>597</sup> See *Permitted List Order*, 15 FCC Rcd at 7210 n.19; *Ka-band Permitted List Order*, 25 FCC Rcd at 1546-47, ¶ 11.

<sup>598</sup> Conversely, under our current rules and the rules we adopt in this order, an earth station seeking to exceed routine uplink limits in these bands may be authorized to transmit only to the space stations referred to in the prior certification of coordination between adjacent space station operators provided to the Commission. See 47 C.F.R. § 25.220(d)(1).

<sup>599</sup> See Section IV.G., *supra*. Unlike inclusion on the Permitted List, however, inclusion on this online list will not make a space station available to additional earth station operators without a modification of the earth station license.

250. We will include in the Permitted List designation all non-U.S. licensed space stations that have been granted U.S. market access in these bands, whether the market access is accomplished through a declaratory ruling or a U.S. earth station license.<sup>600</sup> Currently, a party seeking a reservation of spectrum and orbital location for eventual use to communicate with a U.S. earth station files a “Letter of Intent” with the Commission for the proposed non-U.S. licensed space station.<sup>601</sup> A party seeking to add an in-orbit space station to the Permitted List, however, does so through a petition for declaratory ruling.<sup>602</sup> The procedural mechanism of the “Letter of Intent” filing was adopted prior to the use of the declaratory ruling mechanism to provide U.S. market access. We believe, however, that a petition for declaratory ruling is a sufficient means to request U.S. market access through any type of non-U.S. licensed space station, whether unbuilt or in-orbit, and in any frequency band. Accordingly, to simplify this process, we specify that all requests for market access by the space station operator must be submitted through a petition for declaratory ruling. We will modify our rules accordingly.<sup>603</sup>

251. We also note the recordkeeping difficulties that accompany market access grants through earth station licenses. In these cases, the space station grant of market access can be spread over several, otherwise unrelated earth station authorizations, which may prove difficult to identify. To improve the transparency of this market access procedure, and ultimately to save time, we direct the International Bureau to create appropriate space station files that will collect, under one call sign, the market access granted to a space station through earth station authorizations.

#### 5. “VSAT network”

252. *Background.* We proposed to add a definition of “VSAT network,” which is used in several rule Sections in Part 25, as a network consisting of “remote” earth stations with small antennas that communicate via one or more FSS space stations, which usually include one or more “hub” or “gateway” earth stations that route messages to and from the remote stations and may perform other network control functions.<sup>604</sup>

253. *Discussion.* As part of their proposals to delete “VSAT”-specific provisions in Part 25,<sup>605</sup> SIA and EchoStar argue that a definition of “VSAT network” is unnecessary.<sup>606</sup> EchoStar contends that the proposed definition does not encompass all operations presently licensed as “VSAT,” including Hughes’s own satellite broadband services.<sup>607</sup> SIA argues that “VSAT” is ambiguous and should be replaced by the undefined phrase “blanket licensed earth station networks.”<sup>608</sup>

254. We agree with the approach proposed by SIA and EchoStar, and thus we do not adopt a definition of “VSAT network.” As SIA and EchoStar note, and as we concluded above,<sup>609</sup> VSAT-specific licensing rules are unnecessary. Rather, VSAT networks may be licensed under technical and other rules

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<sup>600</sup> Thus, consistent with our treatment of U.S.-licensed space stations, non-U.S. licensed operators will not need to request specific inclusion on the Permitted List.

<sup>601</sup> See *DISCO II*, 12 FCC Rcd at 24173-74, ¶¶ 184-85, 188.

<sup>602</sup> See *Permitted List Order*, 15 FCC Rcd at 7212, ¶ 10; *Ka-band Permitted List Order*, 25 FCC Rcd at 1548, ¶ 13.

<sup>603</sup> Specifically, we modify Section 25.137(a), (e), and (f). 47 C.F.R. § 25.137(a), (e), (f). Because this is merely a change in agency procedure, its adoption does not require prior notice or an opportunity for comment under the APA. 5 U.S.C. § 553(b)(A).

<sup>604</sup> *Further Notice*, 29 FCC Rcd at 12154, ¶ 131.

<sup>605</sup> See discussion in Section IV.J.13. above.

<sup>606</sup> See SIA Comments at 13-14; EchoStar Comments at 48-50.

<sup>607</sup> EchoStar Comments at 49.

<sup>608</sup> SIA Comments at 13-14.

<sup>609</sup> See Section IV.J.13., *supra*.

that apply more neutrally to blanket-licensed earth station networks. Accordingly, and consistent with our decision to delete Section 25.134, we remove the term “VSAT” in favor of “blanket-licensed earth station networks,” which better indicates the scope of licensing of stations under the relevant provisions.

## 6. Other Definitional Changes

255. We also adopt, without further discussion, our proposals to remove unnecessary text from the definition of “protection areas,”<sup>610</sup> which SIA supports;<sup>611</sup> to define the terms “plane tangent to the GSO arc” and “plane perpendicular to the GSO arc”<sup>612</sup> for the reasons stated above;<sup>613</sup> to define “skew angle,”<sup>614</sup> which EchoStar supports<sup>615</sup> and which SIA supports except for the use of the phrase “plane tangent to the GSO arc,” an argument which we have addressed above;<sup>616</sup> and to define “two-degree-compliant space station,”<sup>617</sup> which EchoStar supports.<sup>618</sup>

### L. Rules Pertaining to Dismissal of Applications

256. *Background.* We proposed to consolidate in Section 25.112 the rules pertaining to dismissal of applications found in Section 25.152, delete redundant text, and add a provision that duplicative space station applications will not be considered.<sup>619</sup>

257. *Discussion.* EchoStar supports our proposals.<sup>620</sup> In addition, EchoStar recommends relaxing the acceptability requirements in Section 25.112. Instead of the Commission returning an application found to be defective, for example, due to incompleteness or internal inconsistencies,<sup>621</sup> EchoStar proposes that we accept the application for filing if the defects are not material to the Commission’s ability to process the application or the public’s ability to review it.<sup>622</sup> EchoStar also recommends giving applicants sixty days to cure any defects.<sup>623</sup>

258. After considering the record, we adopt our proposed amendments to Section 25.112 and consequential deletion of Section 25.152, which should clarify the dismissal rules. We will not adopt

<sup>610</sup> *Further Notice*, 29 FCC Rcd at 12154, ¶ 128.

<sup>611</sup> SIA Reply, Exhibit 3 at 3-4.

<sup>612</sup> *Further Notice*, 29 FCC Rcd at 12154, ¶ 127.

<sup>613</sup> See Sections IV.J.3. and IV.J.4., *supra*.

<sup>614</sup> *Further Notice*, 29 FCC Rcd at 12154, ¶ 129.

<sup>615</sup> EchoStar Comments at 48.

<sup>616</sup> See *id.*; SIA Reply, Exhibit 3 at 4-5.

<sup>617</sup> *Further Notice*, 29 FCC Rcd at 12154, ¶ 130. We note that the text for this definition proposed in the *Further Notice* erroneously included a reference to the routine off-axis EIRP density limits in Section 25.223(b). See *id.*, 29 FCC Rcd at 12178, Appendix A, ¶ 4. These limits apply to feeder-link earth stations for the 17/24 GHz BSS service, for which the Commission’s rules are premised upon four-degree orbital spacing between space stations. See *17/24 GHz BSS Order*, 22 FCC Rcd at 8871-72, ¶¶ 70-74. We remove this reference from the adopted definition.

<sup>618</sup> See EchoStar Comments at 48. We address in Sections IV.J.10. and IV.K.1., above, EchoStar’s argument that two-degree spacing rules should be extended to bands in which GSO FSS operations are on a secondary or non-interference basis.

<sup>619</sup> *Further Notice*, 29 FCC Rcd at 12155, ¶ 132.

<sup>620</sup> EchoStar Comments at 50-51.

<sup>621</sup> See 47 C.F.R. § 25.112(a).

<sup>622</sup> EchoStar Comments at 51.

<sup>623</sup> *Id.* at 51; EchoStar Reply, Appendix A at 2 (text of proposed Section 25.112(d)).

EchoStar's proposals. While in some instances it is efficient for staff to aid parties to address discrepancies in their pending applications, we require all applications under Part 25 to be substantially complete when they are filed.<sup>624</sup> This standard is not "letter perfection."<sup>625</sup> Thus, the Commission may already place on public notice applications with minor inaccuracies that are not material to the Commission's or the public's review. It is not clear how this would change under EchoStar's first proposal. Further, allowing applicants 60 days to cure any defect could encourage hurriedly prepared applications and delay processing. We are not persuaded, therefore, that codifying the broad exceptions proposed by EchoStar would serve the public interest.

**M. Section 25.113 "Station construction, launch authority, and operation of spare satellites"**

259. *Background.* We proposed to replace the term "launch authority" with "deployment approval" in Section 25.113 to avoid any confusion between the Commission's licensing process for space station operation and the functions of the Federal Aviation Administration to license U.S. commercial launch activities.<sup>626</sup> We also proposed to delete, as unnecessary, the requirement in Section 25.113(f) that parties notify the Commission before commencing construction of a space station for which no construction permit is required.<sup>627</sup> Finally, we proposed to consolidate equivalent service-specific rules in Sections 25.142(a)(5), 25.143(c), 25.145(h), and 25.146(m) into a new paragraph (i) in Section 25.113 that states that an NGSO space station licensee may launch and operate technically identical replacement satellites within an existing license term after giving the Commission 30 days' prior notice.<sup>628</sup>

260. *Discussion.* SIA, Planet Labs, and Spire support our proposal to use the term "deployment approval" instead of "launch authority."<sup>629</sup> SIA also supports our proposal to consolidate in a new Section 25.113(i) rules providing for the launch and operation of technically identical NGSO replacement satellites.<sup>630</sup>

261. EchoStar, Planet Labs, and Spire recommend removing the construction notification requirement in Section 25.113(f).<sup>631</sup> Microcom, however, argues that the requirement should be retained and used to inform satellite owners of national telecommunications objectives related to service to rural areas before they begin construction.<sup>632</sup> Microcom also suggests incorporating a new question into the

<sup>624</sup> See *Space Station Licensing Reform Order*, 18 FCC Rcd at 10852, ¶ 244; *International Bureau to Streamline Satellite and Earth Station Processing*, Public Notice, Report No. SPB-140, 1998 WL 747982 (Int'l Bur. rel. Oct. 28, 1998). Under the optional two-step application procedure we adopt above, first-step applicants will be required to file an application with the elements specified above initially, and to follow up with a second-step filing, within two years, including with the first-step filing all of the information required in a single "substantially complete" license application.

<sup>625</sup> For further discussion of the "substantially complete" and "letter perfect" standards, see *Salzer v. FCC*, 778 F.2d 869 (D.C. Cir. 1985).

<sup>626</sup> *Further Notice*, 29 FCC Rcd at 12155, ¶ 133; see also 14 C.F.R. §§ 400 *et seq.*

<sup>627</sup> *Further Notice*, 29 FCC Rcd at 12155, ¶ 134.

<sup>628</sup> *Id.*, 29 FCC Rcd at 12155, ¶ 135. We also proposed to cross-reference the new paragraph (i) in Section 25.113(g), as an exception to the general rule that authority must be applied for and granted before a space station may be launched and operated in orbit. *Id.*

<sup>629</sup> See SIA Reply, Exhibit 3 at 5-8; Planet Labs Comments at 3-4; Spire Comments at 2-3.

<sup>630</sup> SIA Reply, Exhibit 3 at 7-8. SIA also supports our proposal to cross-reference new Section 25.113(i) in Section 25.113(g). *Id.*, Exhibit 3 at 5.

<sup>631</sup> EchoStar Comments at 52; EchoStar Reply, Appendix A at 2; Planet Labs Comments at 4; Spire Comments at 3.

<sup>632</sup> Microcom Comments.

Form 312 application inquiring about proposed satellite service to Alaska, Hawaii, and United States Territories.

262. We adopt our proposals to use the term “deployment approval” in place of “launch authority” for the reason stated in the *Further Notice*,<sup>633</sup> and to consolidate NGSO replacement provisions into Section 25.113(i) to make them generally applicable to blanket NGSO space station licensees.<sup>634</sup> We also adopt our proposal to eliminate the construction notification requirement, which is unnecessary. We will not incorporate Microcom’s proposed geographic service question into Form 312, an issue we did not seek comment on. Form 312, Main Form contains a geographic service certification in Item 43a that is tailored to our corresponding geographic service requirements.<sup>635</sup> In contrast, it appears that Microcom’s proposed question would apply to all space station applications, even those not subject to such requirements, and, therefore, is overly broad. We note, however, that prospective space station applicants are well advised to consult the Commission’s requirements for geographic service prior to beginning construction of a satellite, and assume the risk that a later application may be denied if it fails to comply with any applicable geographic service requirements.<sup>636</sup>

**N. Section 25.114 “Applications for space station authorizations”**

263. The *Further Notice* proposed several minor amendments to Section 25.114, to streamline or clarify some of the satellite license application requirements. All of our proposals are unopposed,<sup>637</sup> and most are explicitly supported by commenters. We conclude here that adoption of our proposed revisions of Section 25.114 are warranted. Accordingly, we adopt our proposals to remove the requirement for a “comprehensive proposal” in Section 25.114(b) as superfluous;<sup>638</sup> to allow applicants for space stations with steerable antenna beams that are not shapeable to describe their proposed coverage area, rather than their expected service area, which will provide them additional flexibility;<sup>639</sup> to specify correctly in Section 25.114(d)(10) the MSS space station applications that must provide the information

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<sup>633</sup> In addition, we make certain non-substantive changes in Section 25.113(h) and (i) for grammatical consistency. Because these changes are non-substantive and inconsequential, their adoption does not require prior notice to the public or an opportunity for comment pursuant to the “unnecessary” exception in Section 553(b)(A) the APA. *See* note 445, *supra*.

<sup>634</sup> We also cross-reference Section 25.113(i) in Section 25.113(g).

<sup>635</sup> Item 43a allows a space station applicant to certify that its proposed operation is not subject to geographic service requirements specified in Part 25, or that its proposed operation is subject to such requirements and that it will comply with them. If proposed operation is subject to geographic service requirements, but the applicant asserts that compliance is technically infeasible or would be economically unreasonable, it must include a narrative description and technical analysis supporting its assertion.

<sup>636</sup> *See, e.g.*, 47 C.F.R. §§ 25.148(c) (geographic service requirements for the DBS service), 25.225 (geographic service requirements for the 17/24 GHz BSS); *see also 1996 Streamlining Order*, 11 FCC Rcd at 21585, ¶ 9 (underscoring that “any construction will be at the applicant’s own risk, and we will not in any way consider the status of construction or expenditures made when acting on the underlying application”).

<sup>637</sup> Our proposal to delete Section 25.210(i)(1), which underlies our consequential proposal to delete Section 25.114(d)(10), was contested. *See* Section IV.X.6., *infra*.

<sup>638</sup> *Further Notice*, 29 FCC Rcd at 12155-56, ¶ 136. EchoStar supports this proposal. EchoStar Comments at 52.

<sup>639</sup> *Further Notice*, 29 FCC Rcd at 12156, ¶ 137. SIA and EchoStar support this amendment of Section 25.114(c)(4)(vi)(D). SIA Reply, Exhibit 3 at 8; EchoStar Comments at 52-53.



required under Section 25.143(b);<sup>640</sup> and to make conforming changes to the application requirements for 17/24 GHz BSS space stations to reflect changes we are making to underlying rules in Section 25.264.<sup>641</sup>

264. The *Further Notice* also proposed to delete Section 25.114(c)(13), which requires applicants to provide the polarization information necessary for determining compliance with Section 25.210(a)(1), (a)(3), and (i), in light of our proposals to delete the underlying requirements in Section 25.210(a)(1), (a)(3), and (i)(1).<sup>642</sup> EchoStar supports this proposal.<sup>643</sup> Below, we remove the polarization requirements Section 25.210(a)(1), (a)(3), and (i)(1). Accordingly, we will adopt conforming changes to Section 25.114(c)(13). Because we are retaining the cross-polarization isolation requirement in Section 25.210(i)(2) for 17/24 GHz BSS space stations, however, which we renumber Section 25.210(i), we will modify Section 25.114(c)(13) to simply provide that space station applicants must include in Form 312, Schedule S, the polarization information necessary for determining compliance with Section 25.210(i).<sup>644</sup>

**O. Further Proposed Changes in Section 25.115 “Applications for earth station authorizations”**

265. *Background.* Section 25.115(a)(3) provides that unless the Commission orders otherwise, an application that meets the criteria in Section 25.115(a)(2) and is filed on Form 312EZ will be deemed granted 35 days after issuance of a public notice of its acceptance for filing if no objection is filed during the 30-day period for filing comments or petitions to deny. Under Section 25.115(a)(2)(iii)-(v), applicants for earth station transmission in the 5925-6425 MHz or 14.0-14.5 GHz bands may use Form 312EZ and the accompanying autogrant procedure only if the proposed operation satisfies routine limits on input power density, antenna gain, and equivalent antenna diameter. Because earth stations in these bands may also be routinely licensed based on compliance with off-axis EIRP density limits, we proposed to revise Section 25.115(a)(2) to allow use of Form 312EZ for applications for GSO FSS earth station transmission in the conventional C-band, conventional Ku-band, or conventional Ka-band that meet the relevant routine licensing criteria in Section 25.134, 25.138, 25.211, 25.212, or 25.218.<sup>645</sup> In addition, we proposed a minor revision to Section 25.115(c)(1) to reflect that applications for conventional Ku-band VSAT networks may be filed with Form 312EZ if the criteria in Section 25.115(a)(2) are met.<sup>646</sup> Finally, we proposed to clarify in Section 25.115(e) that an applicant for blanket GSO FSS earth station authority in the conventional Ka-band need not specify the location of user terminals, but must include the number of terminals to be covered by the license, the geographic area(s) in which they will operate, and the location of hub and/or gateway stations.<sup>647</sup>

<sup>640</sup> *Further Notice*, 29 FCC Rcd at 12156, ¶ 139 (noting that Section 25.143(b) applies to applications for 1.6/2.4 GHz and 2 GHz MSS space stations).

<sup>641</sup> *Id.*, 29 FCC Rcd at 12156, ¶ 140; *see also* Section IV.X.5., *infra*. SIA supports this proposal. SIA Reply, Exhibit 3 at 8-9.

<sup>642</sup> *Further Notice*, 29 FCC Rcd at 12156, ¶ 138.

<sup>643</sup> EchoStar Comments at 53.

<sup>644</sup> In addition to our proposals, Inmarsat suggests that the Commission tailor its space station application requirements to the type of information provided to the ITU, and that we overhaul the requirement to provide technical data in a Form 312, Schedule S. Inmarsat Comments at 2-3. These recommendations are beyond the scope of our proposals in the *Further Notice*.

<sup>645</sup> *Further Notice*, 29 FCC Rcd at 12156-57, ¶ 141.

<sup>646</sup> *Id.*, 29 FCC Rcd at 12157, ¶ 142.

<sup>647</sup> *Id.*, 29 FCC Rcd at 12157, ¶ 143.

266. *Discussion.* SIA and EchoStar support expanding the eligibility criteria for use of Form 312EZ in Section 25.115(a)(2)(iii)-(v).<sup>648</sup> SIA also supports our proposal to note in Section 25.115(c)(1) the availability of Form 312EZ in addition to Form 312.<sup>649</sup>

267. ViaSat, SIA, and O3b support our proposed revisions to the blanket licensing provision in Section 25.115(e), and further recommend expanding the provision to include NGSO FSS blanket earth station applications and additional portions of the Ka-band. ViaSat argues that the rule should permit applications for blanket authority for FSS earth stations communicating with GSO or NGSO space stations in any portion of the 18.3-20.2 GHz and 28.35-30.0 GHz bands.<sup>650</sup> Iridium opposes ViaSat's proposal.<sup>651</sup> SIA and O3b ask that we amend Section 25.115(e) to clarify that blanket licensing is available to NGSO FSS earth stations for operation in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, in which NGSO FSS systems are primary.<sup>652</sup>

268. We adopt our proposal to amend Section 25.115(a)(2)(iii)-(v) to provide for use of Form 312EZ for applications that meet the relevant routine licensing criteria in Sections 25.138, 25.211, 25.212, or 25.218, for the reasons stated in the *Further Notice*.<sup>653</sup> We also adopt our proposal to clarify in Section 25.115(c)(1) that applicants for blanket-licensed earth station networks in the conventional Ku-band that meet the criteria in Section 25.115(a)(2) may submit their application with Form 312EZ. Grant of unopposed routine earth station applications on an expedited basis furthers the public interest, convenience and necessity<sup>654</sup> by regularly permitting faster provision of service from the proposed operations, which conform to standards the Commission has established to ensure compatible operation.

269. In addition, we adopt our proposal to clarify information required for blanket earth station applications filed pursuant to Section 25.115(e), which may avoid confusion that could otherwise arise. We decline ViaSat's proposal to expand blanket licensing under Section 25.115(e) to secondary or non-conforming operations, which was opposed by Iridium and goes beyond the changes contemplated in the *Further Notice*. We adopt, however, the unopposed recommendation of SIA and O3b to codify the Commission's decision in 2000 to allow blanket licensing of NGSO FSS earth stations in the 18.8-19.3 GHz and 28.6-29.1 bands.<sup>655</sup> Codifying this policy will provide greater clarity in our rules.<sup>656</sup>

270. Finally, we make two additional corrections. We amend Section 25.115(k)(1) to indicate that ESVs routinely licensed pursuant to Section 25.221(a)(1) or (a)(3) may also select "Permitted Space Station List" as a point of communication.<sup>657</sup> We also correct Section 25.115(a)(2) to specify that an earth

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<sup>648</sup> SIA Reply, Exhibit 3 at 9-11; EchoStar Comments at 53.

<sup>649</sup> SIA Reply, Exhibit 3 at 11-12.

<sup>650</sup> ViaSat Comments at 10-11.

<sup>651</sup> Iridium Reply at 6-7.

<sup>652</sup> See SIA Reply at 8-9; O3b Reply at 2.

<sup>653</sup> Above, we deleted redundant licensing criteria for VSAT networks in Section 25.134. See Section IV.J.13., *supra*. Accordingly, we will not include a reference to Section 25.134 in Section 25.115(a)(2).

<sup>654</sup> See 47 U.S.C. § 309(a).

<sup>655</sup> *18 GHz Report and Order*, 15 FCC Rcd at 13475, ¶ 95.

<sup>656</sup> Codifying this existing policy is a logical outgrowth of our proposals to clarify and streamline the blanket licensing provisions for earth stations. Further, it does not effect a substantive change, as we are merely codifying an existing policy published in the Federal Register. 65 FR 54155, 54159, ¶ 22.

<sup>657</sup> See 47 C.F.R. §§ 25.115(k)(1), 25.221(b)(7). This revision does not change any legal right or impose any legal obligation on earth station license applicants. Rather, this rule change clarifies Section 25.115(k)(1) by simply restating a current regulatory provision in another rule. Accordingly, we find good cause for concluding that this rule change is insignificant in nature and impact, and inconsequential to the industry and to the public, and so subject to the "unnecessary" exception to the APA notice and comment requirement. See note 445, *supra*.

station applicant proposing reception in the 18.3-18.8 GHz or 19.7-20.2 GHz bands, rather than transmission in the 28.35-28.6 GHz or 29.5-30 GHz bands, may use Form 312EZ only if it will communicate only via space stations for which coordination under footnote US334 of the U.S. Table of Frequency Allocations has already been completed.<sup>658</sup>

**P. Section 25.117 “Modification of station license”**

271. *Background.* We proposed to amend Section 25.117 to provide for automatic grant of license modification applications requesting small space station relocation or small antenna beam repointing.<sup>659</sup> Specifically, we proposed to add a new Section 25.117(h) to provide for automatic grant, 35 days after the date of public notice of acceptance for filing, of unopposed applications for license modification to permit repositioning of the boresight(s) of a GSO space station antenna beam by up to 0.3 angular degrees from the initially authorized position, if the proposed changes are consistent with all Commission rules. We proposed the same autogrant procedure for unopposed applications to relocate DBS or GSO FSS space stations within 0.15° of the initially authorized orbital location. For space stations operating in ITU planned bands, we proposed to exclude applications proposing changes that would require modification of the BSS plan in Appendix 30 or the associated feeder link plan in Appendix 30A of the ITU Radio Regulations. We invited comment, however, as to whether DBS satellites should be given greater flexibility to relocate within the orbital cluster contemplated by the Region 2 BSS and feeder-link plans, which could involve a shift of a DBS satellite’s center location by as much as 0.4°.

272. The *Further Notice* stated that the modifications proposed to be eligible for autogrant would have a negligible impact on the interference environment.<sup>660</sup> However, we requested comment on whether applicants should be required to provide a certification that the change will not result in any increase in interference or increased sensitivity to interference, and that any necessary coordination will be obtained prior to commencement of the modified operations. We also invited comment on a recommendation by Intelsat to provide for automatic grant of applications proposing rotation of a satellite antenna beam by up to 0.3°.

273. Finally, we sought comment on whether we should require a “safe flight profiles” certification associated with applicants proposing relocation, in order to address the risk of collision with other satellites from the relocation.<sup>661</sup> We noted that, in practice, operators seeking to move a space station have routinely provided statements that address collision concerns. We further asked whether the autogrant procedure should be limited to situations in which the operator certifies that there will be no immediate or anticipated overlap in station-keeping volumes with another satellite at the new location.

274. *Discussion.* DIRECTV, EchoStar, and Intelsat support adoption of an autogrant application procedure for GSO space station relocations within 0.15°.<sup>662</sup> No party suggests a more flexible relocation provision for DBS satellites. EchoStar and Intelsat also support automatic grant of

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<sup>658</sup> See *2013 Report and Order*, 28 FCC Rcd at 12423, ¶ 54; *2012 NPRM*, 27 FCC Rcd at 11631-32, ¶ 34. The provisions of footnote US334 apply to operation in the 17.7-20.2 GHz downlink band. 47 C.F.R. § 2.106, footnote US334. An earth station applicant proposing to transmit in the 28.35-28.6 GHz or 29.5-30 GHz bands need not request authority to receive in the bands subject to footnote US334, and vice versa. This correction is in line with a similar restriction in Section 25.115(k)(2). 47 C.F.R. § 25.115(k)(2). Because this amendment merely conforms Section 25.115(a)(2) to footnote US334, we find that prior notice and an opportunity for public comment are unnecessary.

<sup>659</sup> *Further Notice*, 29 FCC Rcd at 12158, ¶ 146.

<sup>660</sup> *Id.*

<sup>661</sup> *Id.*, 29 FCC Rcd at 12158-59, ¶ 147.

<sup>662</sup> DIRECTV Reply at 7; EchoStar Comments at 53-54; Intelsat Comments at 30-31.

applications for antenna beam repositioning of up to 0.3°. <sup>663</sup> EchoStar contends that such relocations and beam repointing should be permitted under the autogrant procedure if the space station operator demonstrates that the change will not cause harmful interference to other operators and, in the case of relocation, if the new orbital location is not occupied by another satellite operator. <sup>664</sup> Regarding a safe flight profiles certification, Intelsat argues that such a requirement is unnecessary, because satellite operators would not operate within the same station-keeping box of another satellite without careful coordination. <sup>665</sup> In the event we conclude otherwise, Intelsat recommends specific text for a safe flight profiles certification based on applicant statements previously accepted in licensing proceedings. Intelsat also concludes that its initial proposal regarding autogrant of applications for antenna beam rotation is unnecessary. <sup>666</sup>

275. We adopt our proposal to allow automatic grant of unopposed applications for DBS and GSO FSS space station relocation within 0.15° of the initially authorized orbital location and unopposed applications for repositioning of antenna beams by up to 0.3 angular degrees. <sup>667</sup> We will provide the same autogrant procedure for petitions that request equivalent modifications of terms of U.S. market access through a non-U.S. licensed space station. <sup>668</sup> We believe this procedure will expedite grant of applications for space station modifications that have a negligible impact on the interference environment, and will further the public interest, convenience, and necessity by promoting faster deployment of service from the modified operation. <sup>669</sup> Accordingly, we decline as unnecessary EchoStar's proposal to require space station applicants to certify or demonstrate that the proposed change will not cause harmful interference or to certify completion of coordination. If an adjacent space station operator believes it will be negatively impacted by the proposed modified operations, it may raise its concerns during the 30-day period for comment on the application. <sup>670</sup> Objections filed during this period will remove the application from the autogrant process.

276. To mitigate the risks of collision associated with an automatically granted application, we will limit the autogrant procedure for space station relocations to applications that include a safe flight profiles certification. The certification will address potential collision risk concerns that may not render an application unacceptable for filing. The certification will, therefore, allow use of the autogrant procedure by some applications that otherwise would be removed from the autogrant track due to concerns over potential debris creation. We adopt a revised version of Intelsat's proposed certification

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<sup>663</sup> EchoStar Comments at 53-54; Intelsat Comments at 30-31.

<sup>664</sup> EchoStar Comments at 53-54.

<sup>665</sup> Intelsat Comments at 31-32.

<sup>666</sup> *Id.* at 31 n.89.

<sup>667</sup> By "initially authorized," we mean authorized by an initial license, license modification, or market access grant prior to any beam repositioning or relocation pursuant to this autogrant procedure or the fleet management procedure in Section 25.118(e).

<sup>668</sup> This will place market access recipients on an equal footing with U.S. licensees in this regard, and is consistent with the Commission's decisions to extend similar provisions to foreign licensees granted market access. *See, e.g., Amendment of the Commission's Space Station Licensing Rules and Policies*, Second Report and Order, IB Docket No. 02-34, 18 FCC Rcd 12507, 12514, ¶ 14 (2003) (applying the "fleet management" procedure in Section 25.118(e) to market access recipients through Section 25.137(f)). The extension of this procedure to non-U.S. licensees is a logical outgrowth of our proposal given the similar considerations involved and the Commission's historical treatment of non-U.S. licensed space station operators in an equivalent manner to U.S. licensees.

<sup>669</sup> *See* 47 U.S.C. § 309(a).

<sup>670</sup> *See* 47 C.F.R. § 25.154.

text, in which applicants must declare that the relocated satellite will not have an overlapping station-keeping volume with another satellite operating or expected to operate at the orbital location.<sup>671</sup>

277. We will allow automatic grant of applications for relocation within 0.15° for both DBS and GSO FSS space stations. This simple 0.15° limit is supported by commenting parties, including two DBS licensees, and no party recommends greater flexibility for DBS satellites.

278. Finally, we will not adopt Intelsat's initial recommendation to provide for autogrant of applications proposing rotation of a satellite antenna beam by up to 0.3°. Intelsat no longer supports this proposal, and no commenter has provided an appropriate means to specify the axis of rotation.

**Q. Section 25.118 “Modifications not requiring prior authorization”**

**1. Earth station modifications**

279. *Background.* Section 25.118(a)(1) states that earth station licensees may modify their authorized facilities without prior authority from the Commission, provided they have complied with applicable coordination requirements in Section 25.251, and the modification does not involve: (i) an increase in EIRP or EIRP density; (ii) an increase in transmitted power; (iii) a change in location of more than 1 second in latitude or longitude for stations operating in frequency bands shared with terrestrial systems; or (iv) a change in location of more than 10 seconds of latitude or longitude for stations operating in frequency bands not shared with terrestrial systems. We proposed to delete the second item in this list as unnecessary, given the exclusion of increases in EIRP or EIRP density.<sup>672</sup> We also proposed to include additional provisos in Section 25.118(a)(1) to exclude changes in operating frequencies or polarization, increases in antenna height, antenna repointing, or the location of a remote control point.<sup>673</sup> In light of these additions, we proposed to delete as superfluous Section 25.118(a)(2) and the provision concerning coordination pursuant to Section 25.251. We also proposed to re-order Section 25.118(a) for clarity.

280. The *Further Notice* also invited comment on a recommendation by SIA to amend Section 25.118(a)(3) to allow a licensee to increase the number of earth stations operating under a blanket license without prior authorization, unless the license specifies a limit on the number of operating stations.<sup>674</sup> We invited comment as well on whether Section 25.115(e) and (f) should be amended to eliminate provisions that require applicants for blanket licenses for conventional Ka-band VSAT networks or Ku-band NGSO FSS earth station networks to specify a maximum number of user terminals.

281. We also proposed, at SIA's suggestion, to amend Section 25.118(a)(5) to allow an earth station operator to communicate, without prior authorization, with a replacement GSO space station positioned within 0.15° of the location of the original space station, provided that there is no increase in the earth station's EIRP or EIRP density.<sup>675</sup>

282. *Discussion.* EchoStar opposes our proposal to add to the list of excluded modifications currently found in Section 25.118(a)(1), and consequently to delete Section 25.118(a)(2).<sup>676</sup> Specifically, EchoStar argues that certain modifications proposed for exclusion are minor or uncontroversial and

<sup>671</sup> See Appendix B, *infra* (Section 25.117(h)(1)(ii)).

<sup>672</sup> *Further Notice*, 29 FCC Rcd at 12159, ¶ 148.

<sup>673</sup> Excluding changes in the location of a remote control point would codify an interpretation of Section 25.118(a)(1) announced by the International Bureau in 2006. See *The International Bureau Provides Guidance Concerning the Relocation of Earth Station Remote Control Points*, Public Notice, 21 FCC Rcd 5045 (Int'l Bur. rel. May 4, 2006).

<sup>674</sup> *Further Notice*, 29 FCC Rcd at 12159, ¶ 149.

<sup>675</sup> *Id.*, 29 FCC Rcd at 12159, ¶ 150.

<sup>676</sup> See EchoStar Comments at 54-55.



should not require a full license modification application, to wit: operation of FSS earth stations in additional frequencies in which FSS is exclusively primary; antenna repointing toward space stations on the Permitted List for transmission in bands in which coordination is not required; increases in antenna height within the limits prescribed by the Federal Aviation Administration; and changes to the location of a remote control point. SIA agrees with EchoStar that changes in the location of a remote control point should be permitted under Section 25.118(a), along with antenna repointing that is within the range of earth station pointing that has already been coordinated.<sup>677</sup>

283. EchoStar also recommends that we modify Section 25.118 to allow a licensee to increase the number of earth stations operating under a blanket license without prior authorization, regardless of the status of the operations in the band.<sup>678</sup> Iridium supports this change for licensed operations on a primary basis only.<sup>679</sup> Iridium argues that an interference analysis supporting a blanket license for secondary or non-conforming operation is often tied to a maximum number of terminals, and that a revised analysis, in a full license modification application, is needed before increasing the number. In contrast, EchoStar contends that a new interference analysis is unnecessary in this situation because harmful interference is not permitted from secondary or non-conforming operations.<sup>680</sup>

284. EchoStar also supports our proposal to allow an earth station operator to communicate with a replacement GSO space station within 0.15° of the orbital location of the original space station without needing to seek prior approval.<sup>681</sup>

285. Finally, EchoStar contends broadly that a letter request should suffice to modify an earth station license under Section 25.118.<sup>682</sup> SIA agrees that submission of a Form 312 and Schedule B is unnecessary to notify the Commission of a change in the location of a remote control point.<sup>683</sup>

286. We adopt a revised list of license modifications that are excluded from the procedures of current Section 25.118(a)(1).<sup>684</sup> Specifically, we will require an application and prior approval under Section 25.117 for earth station modifications that: (i) increase EIRP or EIRP density; (ii) add frequencies; (iii) change polarization; (iv) increase antenna height; (v) repoint the antenna beyond any coordinated arc; or (vi) change the location by more than 1 second of latitude or longitude for stations operating in bands shared with terrestrial systems, or by more than 10 seconds of latitude or longitude for other stations.

287. This list is meant to be relatively simple. While some modifications excluded from processing under Section 25.118(a) may be uncontroversial, as EchoStar contends, variations could require additional attention. For example, a GSO FSS earth station operator could be authorized under Section 25.220 to transmit at power density levels above routine limits based on coordination in certain frequency bands. It would be inappropriate to allow transmission at those existing levels in additional GSO FSS exclusive primary bands if not properly coordinated. Regarding the exclusion for increases in antenna height, we note that such increases could affect coordination with terrestrial services. The record does not provide a sufficient basis for greater precision regarding the exclusions on changes in frequencies, polarization, and antenna height.

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<sup>677</sup> SIA Comments at 20.

<sup>678</sup> EchoStar Comments at 54; EchoStar Reply at 12.

<sup>679</sup> Iridium Comments at 4-5.

<sup>680</sup> See EchoStar Reply at 12.

<sup>681</sup> EchoStar Comments at 55.

<sup>682</sup> *Id.* at 55-56.

<sup>683</sup> SIA Reply at 20.

<sup>684</sup> We are renumbering Section 25.118(a)(1) as 25.118(a)(4).

288. We do agree with commenters, however, that it is unnecessary to require prior approval of antenna repointing except for repointing toward geostationary orbital locations outside of the earth station's coordinated arc, in bands where such coordination is necessary. In other cases, the repointing either has already been coordinated or is not required to be. We also agree that the relocation of an earth station remote control point, where sufficient control is maintained at the new location,<sup>685</sup> need not require prior Commission approval, as these changes are typically uncontroversial.

289. We will continue to require modifications under Section 25.118 to be filed on a Form 312, Main Form and Schedule B if the current Schedule B information is being changed, including changes to the location of a remote control point. We think it is more efficient for applicants to input the modified information directly into Schedule B, which is used to populate the resulting modified authorization, rather than for applicants to describe the changes in a letter and for Commission staff to correct the relevant data fields.

290. In addition, in light of the amendments to current Section 25.118(a)(1) stated above, we delete as unnecessary Section 25.118(a)(1)(ii) and (a)(2), as well as a reference to coordination under Section 25.251, for the reasons described in the *Further Notice*.

291. We also amend Section 25.118 to allow a licensee to increase the number of earth stations operating under a blanket license on a primary basis without prior authorization. This is consistent with SIA's initial proposal,<sup>686</sup> and will expand the current rule, which applies only to VSAT licenses. We believe this will relieve earth station operators from the necessity of filing applications for license modification for changes of a kind that would likely have a negligible interference impact. Because of the different requirements of operations on a secondary or non-routine basis, we will not expand the rule to such operation. To reconcile Section 25.115 with these revisions to Section 25.118, we also amend Section 25.115(e) and (f) to delete the requirements that applicants for blanket licenses for conventional Ka-band VSAT networks or Ku-band NGSO FSS earth station networks specify a maximum number of user terminals. The number of FSS terminals authorized under a blanket license in these bands will not significantly affect any necessary coordination. We also note that Section 25.134(f) requires applicants for VSAT networks in the conventional Ku-band to specify the number of temporary-fixed earth stations they plan to use as hub or remote earth stations. This provision was added for consistency with other rules requiring VSAT applications to specify a maximum number of earth stations to be operated under a blanket license.<sup>687</sup> As a logical outgrowth of our proposal to delete the similar requirement on conventional Ka-band VSAT applicants in Section 25.115(e), and for the same reason, we also delete Section 25.134(f) as unnecessary.

292. Finally, we adopt our unopposed proposal to allow earth stations to communicate, without prior approval, with replacement GSO space stations within 0.15° of the original space station's orbital location. This will streamline modifications having a negligible interference impact.

## 2. Fleet management rule

293. *Background.* Section 25.118(e) provides a streamlined procedure for GSO space station relocations. The rule permits licensees, upon 30 days prior notice to the Commission and to any potentially affected spectrum user, to relocate GSO space stations among the orbital locations assigned to the licensee by the Commission. Licensees may qualify for such "fleet management" relocations only if the space station will operate within the authorized and coordinated technical parameters for the space station previously assigned to the location where it will be moved, and if the licensee makes the certifications required by Section 25.118(e)(3)-(7), and (8)-(9) if the space station is a DBS space station.

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<sup>685</sup> See, e.g., 47 C.F.R. § 25.271.

<sup>686</sup> See Comments of the Satellite Industry Association filed Jan. 14, 2013, at 36.

<sup>687</sup> *Earth Station Streamlining Fifth Report and Order*, 20 FCC Rcd at 5716, ¶ 132.

294. We proposed to amend Section 25.118(e)(1) to include relocations to within  $\pm 0.15^\circ$  of another orbit location assigned to the same licensee.<sup>688</sup> We also proposed to amend Section 25.118(e)(2) to state that a space station may be relocated without prior authorization pursuant to Section 25.118(e) only if the licensee certifies, when giving advance notice of a relocation, that the space station will operate at the new location within the authorized and coordinated technical parameters for the space station previously assigned at that location or within  $0.15^\circ$  of it.<sup>689</sup> In light of our proposed certification requirement in Section 25.118(e)(2), we proposed consequential revisions to Section 25.118(e)(5) and Section 25.118(e)(8) and elimination of Section 25.118(e)(4) as redundant.<sup>690</sup> We also proposed non-substantive clarifying amendments to Section 25.118,<sup>691</sup> and sought comment concerning whether a “safe flight profile” certification would be an appropriate pre-requisite for a fleet management maneuver.<sup>692</sup>

295. *Discussion.* Commenters generally support our proposed amendments to Section 25.118(e).<sup>693</sup> EchoStar supports requiring a safe flight profile certification. Intelsat argues that an additional certification is unnecessary given the requirement to certify coordination of the station-keeping volume of the relocated space station with operators of adjacent space stations, but suggests text for a safe flight profile certification in the event that we find one is necessary. DIRECTV and SES specify that operators of space stations within two degrees of the proposed relocation should be allowed to review and comment prior to the fleet management maneuver.<sup>694</sup>

296. We adopt our proposed amendments to Section 25.118(e), which will afford greater flexibility for fleet management maneuvers.<sup>695</sup> To qualify for such a relocation, a space station operator must notify the Commission and “any potentially affected licensed spectrum user” 30 days in advance of the planned relocation.<sup>696</sup> We believe this addresses DIRECTV and SES’s concerns. In addition, we will require the same safe flight profile certification for a fleet management relocation under Section 25.118(e) that we are requiring for a relocation within  $\pm 0.15^\circ$  of the initially authorized orbital location under the autogrant procedure in Section 25.117. Finally, consistent with the expansion of the autogrant procedure mentioned above, we will expand the fleet management procedure to space station relocations within  $\pm 0.15^\circ$  of the satellite’s initially authorized location. Doing so will provide additional flexibility without creating an increased risk of harmful interference than maneuvers to the orbital location of another space station operated by the licensee.

**R. Section 25.119 “Assignment or transfer of control of station authorization”**

297. *Background.* Before a space station licensee or earth station licensee may consummate a *pro forma* change in ownership, such as a conversion of the licensee from a corporation to a limited liability company with no change in the ultimate control, Section 310(d) of the Act requires it to obtain Commission approval.<sup>697</sup> We invited comment on eliminating this prior approval requirement for *pro*

<sup>688</sup> *Further Notice*, 29 FCC Rcd at 12160, ¶ 153.

<sup>689</sup> *Id.*, 29 FCC Rcd at 12160, ¶ 154.

<sup>690</sup> *Id.*, 29 FCC Rcd at 12160-61, ¶¶ 154-55.

<sup>691</sup> *Id.*, 29 FCC Rcd at 12161, ¶ 156.

<sup>692</sup> *Id.*, 29 FCC Rcd at 12160, ¶ 154.

<sup>693</sup> See DIRECTV Comments at 8; DIRECTV Reply at 7; EchoStar Comments at 56; Intelsat Comments at 32-33; Intelsat Reply at 12; SES Reply at 16.

<sup>694</sup> DIRECTV Comments at 8; DIRECTV Reply at 7; SES Reply at 16.

<sup>695</sup> The revised fleet-management provisions also will be available to operators of non-U.S. licensed space stations that have been granted U.S. market access, pursuant to Section 25.137(f). 47 C.F.R. § 25.137(f).

<sup>696</sup> 47 C.F.R. § 25.118(e).

<sup>697</sup> See 47 U.S.C. § 310(d).

*forma* assignments and transfers of control of common carrier space and earth station licenses under Part 25, by exercising our forbearance authority under Section 10 of the Act.<sup>698</sup> Absent legislative amendments to Section 310(d) to remove the requirement for prior approval, we also requested comment on means to streamline the review process for transfers of non-common carrier space station and earth station licenses, which may fall beyond our forbearance authority.<sup>699</sup>

298. Specifically, Section 10 of the Act provides that the Commission must forbear from applying any regulation or provision of the Act to telecommunications carriers or telecommunications services if the Commission determines that: (1) enforcement of such regulation or provision is not necessary to ensure that the charges, practices, classifications, or regulations by, for, or in connection with that telecommunications carrier or telecommunications service are just and reasonable and are not unjustly or unreasonably discriminatory; (2) enforcement of such regulation or provision is not necessary for the protection of consumers; and (3) forbearance from applying such provision or regulation is consistent with the public interest.<sup>700</sup>

299. *Discussion.* EchoStar supports elimination of the prior approval requirement for *pro forma* transfers of common carrier space station and earth station licenses.<sup>701</sup> For *pro forma* transfers of non-common carrier licenses not subject to forbearance, EchoStar suggests the Commission deem the transfer application granted one day after it is filed to provide parties greater certainty as to the timing of proposed internal reorganizations. Intelsat and SES urge the Commission to seek statutory changes to eliminate the prior approval requirement for *pro forma* transfers of non-common carrier space and earth station licenses.<sup>702</sup> In the interim, both parties suggest the Commission re-evaluate the types of *pro forma* transfers requiring prior approval under the Act. Specifically, Intelsat argues that, if the state or foreign law pursuant to which a licensee is incorporated does not recognize a proposed change in business form as creating a new entity, the Commission should not consider the conversion to be a *pro forma* transfer requiring prior approval under the Act.<sup>703</sup> Finally, Intelsat and SES indicate that the fees for *pro forma* transfer applications could be unduly high.<sup>704</sup> For example, Intelsat notes that a corporate restructuring involving its nearly 50 space station licenses could incur application fees of hundreds of thousands of dollars.

300. We forbear from applying the prior approval requirement in Section 310(d) of the Act to *pro forma*<sup>705</sup> assignments and transfers of control of space station and earth station licenses when the licensee qualifies as a “telecommunications carrier.” We recognize that the Commission has provided

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<sup>698</sup> See *Further Notice*, 29 FCC Rcd at 12161, ¶ 157. The *Process Reform Report* recommended eliminating the requirement for prior approval of *pro forma* transfers of space and earth station Licenses. *Process Reform Report* at 65, Recommendation 5.7.

<sup>699</sup> See *1998 Biennial Regulatory Review – Review of International Common Carrier Regulations*, Report and Order, IB Docket No. 98-118, 14 FCC Rcd 4909, 4944-45, ¶ 87 (1998 *International Biennial Review Order*) (“Because most earth station licenses are not common carrier radio licenses, we might not be able to use our Section 10 forbearance authority to avoid the requirements of Section 310(d) with regard to assignments and transfers of control of earth station authorizations.”).

<sup>700</sup> 47 U.S.C. § 160(a).

<sup>701</sup> See EchoStar Comments at 57-58; EchoStar Reply, Appendix A at 4.

<sup>702</sup> See Intelsat Comments at 34-35; SES Reply at 16-17.

<sup>703</sup> See Intelsat Comments at 34-35.

<sup>704</sup> See *id.* at 34; SES Reply at 17 n.74.

<sup>705</sup> See generally *Federal Communications Bar Association's Petition for Forbearance from Section 310(d) of the Communications Act regarding Non-Substantial Assignments of Wireless Licenses and Transfers of Control Involving Telecommunications Carriers*, Memorandum Opinion and Order, 13 FCC Rcd 6293, 6297-99, ¶¶ 7-8 (1998) (*Section 310(d) Forbearance Order*).

such relief before and has conducted forbearance analyses in those cases similar to the analysis we perform here.<sup>706</sup>

301. Regarding the first prong of the forbearance standard in Section 10(a) of the Act, we conclude that prior approval of applications for consent to *pro forma* transfers and assignments of space and earth station licenses is not necessary to ensure that licensees' charges, practices, classifications, and services are just and reasonable, and not unjustly or unreasonably discriminatory. Because *pro forma* transactions do not affect actual control of the licensee, they are unlikely to have any impact on the licensees' charges, practices, classifications, or services. Accordingly, it has not been necessary to consider these issues in our review of *pro forma* transactions. Given the existence of other mechanisms to deal with issues of this kind should they arise in the future,<sup>707</sup> and the fact that we have had no need to consider them in the context of *pro forma* transactions, we conclude that the first prong of the forbearance standard is met.

302. Regarding the second prong, we conclude that requiring prior Commission review of *pro forma* transfers and assignments of space and earth station licenses is not necessary for the protection of consumers. Based on our experience reviewing *pro forma* applications, we find that *pro forma* transfers and assignments rarely, if ever, raise consumer issues, because the ultimate control of the licensee—which has already been subject to Commission review and approval—does not change as a result of the transaction. We, therefore, conclude that the second prong of the forbearance standard is met.

303. Finally, we conclude that forbearance from requiring prior approval of *pro forma* transfers and assignments of space and earth station licenses is consistent with the public interest. We conclude that such *pro forma* assignments and transfers do not raise public interest concerns and that we should, therefore, cease requiring licensees to obtain prior Commission approval of such transactions. We also conclude that eliminating the requirement for prior approval would promote competitive market conditions by allowing licensees to change their ownership structure or internal organization as business needs require without undue regulatory burdens.

304. Thus, we will not require prior approval for *pro forma* assignments and transfers of control of common carrier space station and earth station licenses when the licensee meets the definition of "telecommunications carrier" in the Act.<sup>708</sup> Rather, the *pro forma* assignee or entity that has undergone a *pro forma* change in ownership must file a notification within 30 days of consummation of the transaction. The notification must be provided in a Form 312, Main Form and Schedule A and include a certification that the transfer of control or assignment was *pro forma* and that, together with all previous *pro forma* transactions, it did not result in a change in the actual controlling party.<sup>709</sup> Updated ownership information must also be provided as necessary to ensure that the Commission's records are kept accurate. After receipt of the Form 312, Main Form and Schedule A and any necessary attachments, the Commission will place the notification on public notice as granted.<sup>710</sup> Any interested party that objects to

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<sup>706</sup> See Section 310(d) Forbearance Order, 13 FCC Rcd at 6300-05, ¶¶ 11-21; 1998 Biennial Regulatory Review - Review of International Common Carrier Regulations, IB Docket No. 98-118, Notice of Proposed Rulemaking, 13 FCC Rcd 13713, 13721, ¶¶ 15-17 (1998); 1998 International Biennial Review Order, 14 FCC Rcd at 4928, ¶ 42.

<sup>707</sup> For example, pursuant to Section 208 of the Act, the Commission must investigate and act on a complaint by any party or entity concerning a common carrier's charges, classifications, regulations, or practices. 47 U.S.C. § 208.

<sup>708</sup> See 47 U.S.C. § 153(51). We note that Sections 54.706, 54.711, and 54.713 require all telecommunications carriers providing interstate telecommunications services to contribute to the universal service fund and file a FCC Form 499-Q (Telecommunications Reporting Worksheet). 47 C.F.R. §§ 54.706, 54.711, 54.713.

<sup>709</sup> Such notifications will not be subject to application fees. See Section 310(d) Forbearance Order, 13 FCC Rcd at 6304-05, ¶ 20.

<sup>710</sup> See *id.*, 13 FCC Rcd at 6312, ¶ 36.



the transaction may, within 30 days from the date upon which public notice is given, file a petition requesting reconsideration.<sup>711</sup>

305. In addition, we adopt EchoStar's proposal to deem granted, one business day after filing, all applications for *pro forma* transfer or assignment of non-common carrier space station and earth station licenses. As noted above, *pro forma* transfer applications do not raise public interest concerns, and the Commission's review is limited to determining that they are, in fact, *pro forma* in nature.<sup>712</sup> Confirmation that the transaction is *pro forma* may be accomplished during the reconsideration period.<sup>713</sup> We believe the deemed-granted approach will provide non-common-carrier licensees greater certainty regarding the timing of proposed restructurings.<sup>714</sup> To qualify for this procedure, in addition to the other application requirements, parties must certify that the transfer of control or assignment is *pro forma* and that, together with all previous *pro forma* transactions, it will not result in a change in the actual controlling party. The transfer must also not require the Commission to issue any waiver or a declaratory ruling. We will indicate grant of such applications in periodic public notices, and interested parties,<sup>715</sup> and the Commission,<sup>716</sup> will have an opportunity to challenge or revisit the grant.

306. We note that the Commission receives notifications of *pro forma* assignments and transfers of receive-only earth station registrations.<sup>717</sup> As they are neither construction permits nor station licenses, these registrations are not subject to Section 310(d) of the Act. While notifications of *pro forma* assignment of such registrations are necessary to update the Commission's records as to the current registrant, we do not believe that notification of *pro forma* transfers of control, reflecting minor ownership changes where the registrant remains the same, is necessary. Accordingly, as a logical outgrowth of our broad inquiry on ways to streamline transfer applications not subject to forbearance, we will not require holders of receive-only registrations to notify the Commission when they have undergone *pro forma* transfers of control, but will continue to require notification of *pro forma* assignments.<sup>718</sup>

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<sup>711</sup> See 47 C.F.R. § 1.106.

<sup>712</sup> See *Section 310(d) Forbearance Order*, 13 FCC Rcd at 6304, ¶ 18.

<sup>713</sup> See generally *id.*, 13 FCC Rcd at 6304, ¶¶ 18-19; 47 C.F.R. § 1.108.

<sup>714</sup> This procedure is similar to a streamlined "immediate approval" procedure adopted for transfer applications in certain wireless services, which is not limited to *pro forma* transactions. See 47 C.F.R. § 1.948(j)(2); *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, Second Report and Order, WT Docket No. 00-230, 19 FCC Rcd 17503, 17554-56, 17557, ¶¶ 101-03, 108 (2004) (*Secondary Markets Second Report and Order*). As with that procedure, the deemed-granted approach we adopt here is consistent with our statutory requirements for case-by-case review and approval of transfer applications, because the Commission's public interest determination will be based on the particular certifications, facts, and representations contained in the application. See *Secondary Markets Second Report and Order*, 19 FCC Rcd at 17557, ¶ 108. Our experience with *pro forma* transactions involving licenses in terrestrial wireless services indicates that a deemed-granted approach is both appropriate and workable to address the similar issues raised by *pro forma* transactions involving licenses in the satellite services.

<sup>715</sup> See 47 C.F.R. § 1.106.

<sup>716</sup> See 47 C.F.R. § 1.108.

<sup>717</sup> See *Deregulation of Domestic Receive-Only Satellite Earth Stations*, Second Report and Order, CC Docket No. 78-374, 104 FCC 2d 348, 353, ¶¶ 10-11 (1986); *Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference between Fixed-Satellites at Reduced Orbital Spacings and to Revise Application Processing Procedures for Satellite Communications Services*, First Report and Order, CC Docket No. 86-496, 6 FCC Rcd 2806, 2807, ¶ 4 (1991); *New Rules for Part 25-Satellite Communications*, Public Notice, 6 FCC Rcd 3738 (rel. June 21, 1991); *Implementation of New Part 25 Regulations for Satellite Space and Earth Station Application and Licensing Procedures*, Public Notice, 12 FCC Rcd 13850, 13852 (rel. Sept. 16, 1997).

<sup>718</sup> We note that such notifications are not subject to application fees.

307. We decline to adopt the proposals of Intelsat and SES to look to the local governing law of a business entity to determine whether a *pro forma* change in ownership has occurred that requires prior approval under Section 310(d) of the Act. We do not have a sufficiently developed record on this recommendation, which would logically extend beyond the satellite services and could require interpretation of complex foreign laws on business associations. In addition, we note that Congressional action would be required to eliminate the prior approval requirement for *pro forma* assignments and transfers of control of non-common carrier space and earth station licenses, and that Congress may wish to explore this issue in the future.

308. In response to Intelsat's and SES's concern regarding fees for *pro forma* transfer applications, we note that the Commission's fee schedule is prescribed by Section 8 of the Communications Act.<sup>719</sup> Section 8 leaves the Commission no discretion with respect to the methodology and timing of adjustments to application fees.<sup>720</sup>

**S. Section 25.129 "Equipment authorization for portable earth-station transceivers"**

309. *Background.* Section 25.129(c) states that applicants for equipment certification of "portable" earth-station transceivers must provide, among other things, "any test data necessary to demonstrate compliance with pertinent performance standards in §§25.138, 25.202(f), 25.204, 25.209, and 25.216," and "the statements required by §2.1093(c)."<sup>721</sup> In the *Further Notice*, we observed that a transceiver that complies with Section 2.1093(d) would also necessarily comply with Section 25.204, and, therefore, we proposed to delete the reference to Section 25.204.<sup>722</sup> We also proposed to delete, as infeasible, the requirement that portable devices as defined in Section 25.129 demonstrate compliance with the antenna gain envelopes in Section 25.209.<sup>723</sup> Finally, we proposed to amend Section 25.129(c) to include a reference to Section 25.202(d),<sup>724</sup> which provides a frequency tolerance requirement of 0.001% for earth stations licensed under Part 25.<sup>725</sup>

310. *Discussion.* Inmarsat supports our proposal to delete the references to Sections 25.204 and 25.209 in Section 25.129(c).<sup>726</sup> Inmarsat asks, however, that we clarify the requirement to demonstrate compliance with Section 25.202(d) before incorporating a "potentially duplicative" provision in Section 25.129.<sup>727</sup>

311. We adopt our proposal to delete the references to Sections 25.204 and 25.209 for the reasons stated in the *Further Notice*. After further consideration, however, we decline to require applicants for equipment certification required by Section 25.129 to submit additional test data demonstrating that the transceivers will comply with the general frequency tolerance rule in Section

<sup>719</sup> 47 U.S.C. § 158.

<sup>720</sup> *Amendment of the Schedule of Application Fees Set Forth in Sections 1.1102 through 1.1109 of the Commission's Rules*, Order, GEN Docket No. 86-285, 29 FCC Rcd 3276, 3276, ¶ 2 (2014).

<sup>721</sup> 47 C.F.R. § 25.129(c); *see also Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite (GMPCS) Memorandum of Understanding and Arrangements*, IB Docket No. 99-67, Second Report and Order, 18 FCC Rcd 24423 (2003) (adopting Section 25.129).

<sup>722</sup> *Further Notice*, 29 FCC Rcd at 12161, ¶ 159.

<sup>723</sup> *Id.*, 29 FCC Rcd at 12161-62, ¶ 159.

<sup>724</sup> *Id.*, 29 FCC Rcd at 12162, ¶ 160.

<sup>725</sup> 47 C.F.R. § 25.202(d); *see also Amendment of Parts 21 and 25 of the Rules to Establish Revised Earth Station Coordination and Interference Calculation Methods for International and Domestic Communication-Satellite Facilities by Nongovernmental Entities*, Docket No. 19495, Report and Order, 40 FCC 2d 395, 399, ¶ 15 (1973).

<sup>726</sup> Inmarsat Comments at 6-7.

<sup>727</sup> *Id.* at 7.

25.202(d). Applicants for operation of such equipment must already submit any information required for licensing under Part 25, and we do not believe that any separate demonstration of compliance with this operational rule is necessary for equipment certification.

**T. Section 25.130 “Filing requirements for transmitting earth stations”**

312. We proposed to amend Section 25.130(b) to reflect the relevant application requirements located in Section 25.203.<sup>728</sup> We also proposed clarifying amendments to Section 25.130(g) and the note to Section 25.130(g).<sup>729</sup> EchoStar<sup>730</sup> and SIA<sup>731</sup> support our proposed clarifications of Section 25.130(g) and the note to Section 25.130(g), respectively, and no commenter opposes our proposals for this Section. We adopt our proposals for Section 25.130 to reflect in this Section the existing application requirements in Section 25.203 and to clarify the meaning of Section 25.130(g), which should make our rules easier to understand.

**U. Section 25.131 “Filing requirements and registration for receive-only earth stations”**

313. *Background.* Section 25.131(j) requires receive-only earth stations to be licensed by the Commission in order to receive signals from non-U.S. licensed space stations that are not on the Permitted Space Station List. The purpose of this restriction is to ensure that there is a “regulatory control point” for all transmissions from non-U.S. licensed satellites to U.S. receive-only earth stations.<sup>732</sup> The market-access procedures in Section 25.137, however, also provide a regulatory control point for non-U.S. licensed space stations not eligible for inclusion on the Permitted List. We, therefore, proposed to amend Section 25.131(j) to allow unlicensed receive-only earth stations to receive signals from any non-U.S. licensed space station approved for U.S. market access under Section 25.137.<sup>733</sup> We also proposed to amend Section 25.131(b) to enable operators of unlicensed receive-only earth stations to register for protection of reception of signals from space stations approved for U.S. market access that are not on the Permitted List.<sup>734</sup>

314. *Discussion.* Commenters support our proposed amendments to Section 25.131(b)<sup>735</sup> and (j).<sup>736</sup> In addition, EchoStar suggests that Section 25.131 be amended to allow unlicensed reception from any non-U.S. licensed space station, regardless whether the space station has been approved for U.S. market access.<sup>737</sup> EchoStar argues that the licensing requirement for receive-only earth stations communicating with non-U.S. licensed space stations imposes a discriminatory burden that is not imposed on receive-only earth stations communicating with U.S.-licensed space stations.

315. We adopt our proposed changes to Section 25.131(b) and (j), which will provide greater flexibility and protection from harmful interference to operators of unlicensed receive-only earth stations. We decline EchoStar’s proposal, and will continue to require receive-only earth stations to be licensed before receiving transmissions from a non-U.S. licensed space station that has not been granted U.S.

<sup>728</sup> *Further Notice*, 29 FCC Rcd at 12162, ¶ 161; *see also* 47 C.F.R. § 25.203(f), (i)(1), (k).

<sup>729</sup> *Further Notice*, 29 FCC Rcd at 12162-63, ¶¶ 162-63.

<sup>730</sup> EchoStar Comments at 58.

<sup>731</sup> *See* SIA Reply, Exhibit 3 at 23-24.

<sup>732</sup> *See DISCO II*, 12 FCC Rcd at 24179-80, ¶ 201.

<sup>733</sup> *Further Notice*, 29 FCC Rcd at 12163, ¶ 164.

<sup>734</sup> *Id.*, 29 FCC Rcd at 12163, ¶ 165.

<sup>735</sup> *See* SIA Reply, Exhibit 3 at 24-25; Inmarsat Comments at 6.

<sup>736</sup> *See* AvL Comments at 3; EchoStar Comments at 58-59; Inmarsat Comments at 6; O3b Reply at 2; SES Reply at 15.

<sup>737</sup> EchoStar Comments at 58-59; EchoStar Reply, Appendix A at 4.

market access pursuant to Section 25.137. We believe that this restriction remains consistent with our treaty obligations,<sup>738</sup> and provides a necessary vehicle for Commission review of transmissions from non-U.S. licensed space stations entering the United States similar to the review we perform for transmissions from U.S.-licensed space stations.

**V. Section 25.133 “Period of construction; certification of commencement of operation”**

316. *Background.* Section 25.133(b)(1)(v) states that initial licenses for individually licensed earth stations will include a condition requiring the licensee to certify, upon completion of construction, that “each antenna has been tested and found to perform within 2 dB of the applicable pattern specified in §25.209 or other authorized pattern.” We proposed to amend this Section to indicate, instead, that a filing pursuant to Section 25.133(b)(1) should include a certification that each antenna has been tested and found to perform within authorized gain patterns or off-axis EIRP density levels.<sup>739</sup> We also proposed to delete Section 25.133(c), which would be rendered unnecessary by adoption of our proposed amendment to Section 25.133(b)(1)(v).

317. Section 25.133(b)(2) requires blanket earth station licensees to file the information required by Section 25.133(b)(1) when the network commences operation. Section 25.133(b)(1) includes a requirement to certify “that the facility as authorized has been completed.” We proposed to amend Section 25.133(b)(2) to require blanket licensees to notify the Commission when their networks commence operation, rather than certify that “the facility as authorized has been completed.”<sup>740</sup> We also proposed to amend Section 25.133(b)(2) to require blanket licensees to certify that each hub antenna, and each type of antenna used in remote stations in the network, has been tested and found to perform within authorized specifications, rather than requiring them to certify that the performance of every antenna in the network has been tested.

318. Finally, we proposed to revise Section 25.133(a)(2) to correct an oversight from the *2013 Report and Order*, and to state simply that operation of a network of earth stations at unspecified locations under an initial blanket license must commence within 12 months after the license is granted unless the Commission orders otherwise.<sup>741</sup>

319. *Discussion.* SIA agrees with our proposed amendments to the construction notification requirements for blanket licenses in Section 25.133(b)(2).<sup>742</sup> Regarding our proposal to specify that each type of blanket-licensed antenna must be tested, EchoStar argues that as long as any one type of antenna authorized under the blanket license is enabled, the notification should be considered sufficient.<sup>743</sup> EchoStar contends that if any one of the antenna types authorized under a blanket license is in operation, the authorized spectrum is in use, and that some types of antennas may be authorized but infrequently deployed. EchoStar also argues that we should retain, in Section 25.133(b)(1)(v), the 2 dB margin for antenna gain performance tested on-site to account for the increased risk of measurement error of such testing, provided that the earth station operator meets the relevant EIRP density envelope.<sup>744</sup>

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<sup>738</sup> See *DISCO II*, 12 FCC Rcd at 24180, ¶ 203.

<sup>739</sup> *Further Notice*, 29 FCC Rcd at 12164, ¶ 167.

<sup>740</sup> *Id.*, 29 FCC Rcd at 12164, ¶ 168. We did not propose to require this notification within a specified period of time after commencement of operation of the network.

<sup>741</sup> *Id.*, 29 FCC Rcd at 12164, ¶ 166.

<sup>742</sup> SIA Reply, Exhibit 3 at 28.

<sup>743</sup> EchoStar Comments at 59-60.

<sup>744</sup> See *id.* at 60.

320. We adopt our proposal to remove the 2 dB margin for measured antenna gain in Section 25.133(b)(1)(v), and to specify instead that the tested antenna must conform to either authorized gain patterns or EIRP density levels. Because operators will have the option of certifying tested compliance with EIRP density envelopes, we believe that maintaining the 2 dB antenna gain margin under EchoStar's proposal is unnecessary.<sup>745</sup> Accordingly, we will delete Section 25.133(c) as unneeded.

321. We agree with EchoStar that the notification due to the Commission when a blanket-licensed earth station network begins operation need not include a certification that each type of antenna used in remote stations has been tested. Rather, the network could begin operation with use of only one type of authorized remote earth station antenna. We will modify Section 25.133(b)(2) accordingly. However, to ensure their tested performance, we will require an additional certification for antenna models deployed after the initial notification when the additional models are first deployed. Finally, we adopt our proposed amendments to Section 25.133(a)(2), which correct an oversight in the *2013 Report and Order*.

#### **W. Other Proposed Changes in Section 25.138**

322. We proposed to delete the first sentence of Section 25.138(e), which contains a protection rule for GSO FSS earth stations in the conventional Ka-band, as redundant with the general provision in Section 25.209(c)(1).<sup>746</sup> We also proposed to delete, as unnecessary, the other sentence of Section 25.138(e), which requires applicants under that Section to provide receive-band antenna gain plots "for purposes of ensuring the correct level of protection" when operating. Finally, we proposed to delete Section 25.138(g), which requires applicants for renewal of a conventional Ka-band earth station license granted under Section 25.138 to specify the number of constructed earth stations, as no such requirement applies to renewal applicants of any other type of earth station.<sup>747</sup> SIA and EchoStar support these proposals,<sup>748</sup> which we adopt for the reasons noted above.

#### **X. Service-Specific Space Station Licensing Rules**

##### **1. Section 25.143 "Licensing provisions for the 1.6/2.4 GHz Mobile-Satellite Service and 2 GHz Mobile-Satellite Service"**

323. Consistent with an amendment of Section 25.114(a), we proposed to revise Section 25.143(a) to indicate that a single blanket license may be issued for an NGSO constellation in the 1.6/2.4 GHz MSS or 2 GHz MSS comprised of satellites that are not all technically identical.<sup>749</sup> SIA supports our proposal,<sup>750</sup> which no commenter opposes, and which we adopt to align Section 25.143(a) with Section 25.114(a).

##### **2. Section 25.145 "Licensing provisions for the Fixed-Satellite Service in the 20/30 GHz bands"**

324. *Background.* Section 25.145(f)(2) requires yearly reporting of the number of earth stations brought into service under a blanket FSS earth station license in the 18.3-20.2 GHz and 28.35-

<sup>745</sup> In the event that an earth station is routinely licensed pursuant to input power density and antenna gain criteria, and the tested performance of the antenna on-site does not fully comply with those antenna gain criteria, we will allow the construction notification requirement to be satisfied if the input power density is reduced such that, when added to the tested antenna gain pattern, the calculated EIRP density levels fall within the relevant EIRP density envelope.

<sup>746</sup> *Further Notice*, 29 FCC Rcd at 12165, ¶ 170.

<sup>747</sup> *Id.*, 29 FCC Rcd at 12165, ¶ 171.

<sup>748</sup> SIA Reply, Exhibit 3 at 40-41; EchoStar Comments at 61.

<sup>749</sup> *Further Notice*, 29 FCC Rcd at 12165, ¶ 172.

<sup>750</sup> See SIA Reply, Exhibit 3 at 43-44.



30.0 GHz bands. No similar requirement applies to licensees of FSS earth stations in other bands. At SIA's suggestion, we proposed to delete this provision as unnecessary.

325. *Discussion.* SIA and EchoStar support our proposal.<sup>751</sup> EchoStar also encourages additional clarifying revisions to Section 25.145.<sup>752</sup> Because most of the remaining provisions relate solely to NGSO FSS operations, EchoStar proposes that the Section heading specify NGSO FSS, and that the prohibition on certain exclusionary arrangements in paragraph (e), which also applies to GSO FSS applicants, be moved to a different Section. EchoStar also argues that paragraph (g), which notes that FSS operations in the 18.3-19.3 GHz band are entitled to protection from terrestrial operations in that band, is unnecessary.

326. We adopt our proposal to delete the annual reporting requirement in Section 25.145(f)(2), which is an unequal reporting burden on certain blanket licensees that is not necessary to the ensure compatible operation. We also adopt EchoStar's proposal to delete paragraph (g), because that paragraph simply acknowledges that the periods for co-primacy of grandfathered terrestrial stations in the 18.3-19.3 GHz band have ended.<sup>753</sup> Regarding Section 25.145(e), we note that identical restrictions exist in the licensing rules for other services,<sup>754</sup> and, for consistency and clarity, we will also retain this provision in the licensing rules for FSS in the 18.3-20.2 GHz and 28.35-30.0 GHz bands at this time. Accordingly, the Section heading will continue to reflect both GSO and NGSO FSS licensing provisions.

**3. Section 25.146 "Licensing and operating rules for the non-geostationary orbit Fixed-Satellite Service in the 10.7 GHz-14.5 GHz bands"**

327. We proposed to correct the title of ITU-R Recommendation S.1503 stated in the second sentence of Section 25.146(a)(1). SIA supports this amendment,<sup>755</sup> which no commenter opposes, and which we adopt to correct an error. In addition, we also take this opportunity to amend the heading of Section 25.146(a)(2) to correctly indicate the "Earth-to-space" and "EPFD<sub>up</sub>" limits that follow.<sup>756</sup>

**4. Section 25.147 "Licensing provision for NGSO MSS feeder downlinks in the band 6700-6875 MHz"**

328. Section 25.147 provides that if an NGSO MSS satellite transmitting in the 6700-6875 MHz band causes harmful interference to previously licensed co-frequency public safety facilities, the satellite licensee must remedy the interference complaint. Because this is an operating requirement rather than a licensing rule, we proposed to move it to a new Section 25.288 in Subpart D ("Technical Operations"). SIA supports our proposal,<sup>757</sup> and no commenter opposes it. We adopt our proposal to place this rule in a more appropriate subpart.

<sup>751</sup> See *id.*, Exhibit 3 at 46; EchoStar Comments at 61-62.

<sup>752</sup> EchoStar Comments at 62.

<sup>753</sup> See *2013 Report and Order*, 28 FCC Rcd at 12452-53, ¶ 163. We find that there is good cause for concluding that notice and comment for this deletion is unnecessary within the meaning of Section 553(b)(B) of the APA.

<sup>754</sup> See 47 C.F.R. §§ 25.142(d), 25.143(h).

<sup>755</sup> See SIA Reply, Exhibit 3 at 47.

<sup>756</sup> This correction is non-substantive and inconsequential. Thus, we find that there is good cause for concluding that revising these headings is "unnecessary," and so subject to an exception to the notice and comment requirements of the APA. See note 445, *supra*.

<sup>757</sup> SIA Reply, Exhibit 3 at 48-49, 130.

**5. Section 25.264 “Requirements to facilitate reverse-band operation in the 17.3-17.8 GHz band of 17/24 GHz Broadcasting-Satellite Service and Direct Broadcast Satellite Service space stations”**

329. *Background.* We proposed to amend Section 25.264 to permit applicants for 17/24 GHz BSS space station licenses to submit required space station antenna gain information and associated certifications in a license application or within 60 days after completion of critical design review for the space station, whichever occurs later, rather than only at the time of application, to allow for such information to reflect a more mature satellite design.<sup>758</sup> To accommodate the potentially later submission of gain information and certifications, we also proposed corresponding amendments to the definition of “prior-filed U.S. DBS space station” in Section 25.264(b)(1), which 17/24 GHz BSS space station applicants or licensees must take into account.<sup>759</sup> Finally, we proposed to amend Section 25.264(c) and (d) to require submission of measured space station gain information and power flux density (pfd) calculations up to two months before launch, rather than nine months before launch, and additionally to require updated pfd calculations in a modification application to change the orbital location of a 17/24 GHz BSS space station.<sup>760</sup>

330. *Discussion.* SIA generally supports our proposed amendments to Section 25.264, but argues that Section 25.264(c) should be revised to permit acceptance of simulated antenna gain data in place of measured data to provide applicants additional technical flexibility.<sup>761</sup> We acknowledge that strict compliance with Section 25.264(c) has proven difficult. However, we decline to adopt SIA’s proposal to accept simulated data in place of gain measurements, as it is not clear whether the simulated data would replicate the accuracy of the measurements currently required. We thus adopt our proposed amendments to Section 25.264 for the reasons stated in the *Further Notice*.

**6. Polarization Requirements for FSS Space Stations**

331. *Background.* Section 25.210(a) requires space stations providing domestic FSS in the 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space) frequency bands to use orthogonal linear polarization with one polarization plane defined by the equatorial plane, use opposite polarizations for uplink and downlink transmissions on the same transponder, and be capable of switching polarization sense upon ground command. Section 25.210(i)(1) requires space station antennas used for FSS operation to provide cross-polarization isolation of at least 30 dB within the primary coverage area. In the *2012 NPRM*, the Commission invited comment as to whether these polarization requirements remained necessary,<sup>762</sup> but declined to make any changes to them in the *2013 Report and Order* because of concerns over protection of analog transmissions.<sup>763</sup> In the *Further Notice*, we noted that analog transmissions are routinely coordinated and are becoming rare.<sup>764</sup> We also proposed to require coordination of analog video transmissions.<sup>765</sup> Accordingly, we proposed to delete Section 25.210(a) and (i)(1).

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<sup>758</sup> *Further Notice*, 29 FCC Rcd at 12166, ¶ 177.

<sup>759</sup> *Id.*, 29 FCC Rcd at 12166-67, ¶ 178.

<sup>760</sup> *Id.*, 29 FCC Rcd at 12167, ¶ 179.

<sup>761</sup> SIA Comments at 21-22; SIA Reply, Exhibit 3 at 125-28.

<sup>762</sup> *2012 NPRM*, 27 FCC Rcd at 11655, 11656, ¶¶ 127, 130.

<sup>763</sup> *2013 Report and Order*, 28 FCC Rcd at 12458, 12459, ¶¶ 180, 184.

<sup>764</sup> *Further Notice*, 29 FCC Rcd at 12167-68, ¶¶ 180-81.

<sup>765</sup> *Id.*, 29 FCC Rcd at 12167-68, ¶ 180.

332. *Discussion.* Intelsat and Iridium support deletion of the 30 dB cross-polarization isolation requirement in Section 25.210(i)(1).<sup>766</sup> Inmarsat and DIRECTV suggest, instead, that the requirement be relaxed to 25 dB.<sup>767</sup> DIRECTV argues that this would reduce the need for waivers of the rule while still capturing the spectrum management benefits of cross-polar isolation. No commenter specifically addressed our proposed amendments to Section 25.210(a).

333. We adopt our proposal to remove the polarization requirements in Section 25.210(a) and (i)(1). We believe that the requirement on conventional C-band space stations in Section 25.210(a) is no longer necessary for protection of reception of analog signals. Analog transmissions not for purposes of TT&C are increasingly rare and frequently coordinated, and analog video transmissions must be coordinated under the modified Section 25.140(a)(1) that we are adopting here.<sup>768</sup> We also believe that the 30 dB cross-polarization isolation requirement in Section 25.210(i)(1) is unnecessary to protect analog signals, due to the same considerations. Accordingly, we decline the recommendation of Inmarsat and DIRECTV simply to reduce the requirement to 25 dB of cross-polarization isolation.

**Y. Section 25.156 “Consideration of applications”**

334. The *Further Notice* observed that Section 25.156(b) provides for reconsideration of grant of an application under Part 25 that is narrower in scope than the relief available under Sections 1.106 or 1.115, and that is inconsistent with International Bureau practice regarding petitions for reconsideration and applications for review.<sup>769</sup> We, therefore, proposed to delete Section 25.156(b). EchoStar supports our proposal,<sup>770</sup> which we adopt for the reason stated in the *Further Notice*.

**Z. Section 25.159 “Limits on pending applications and unbuilt satellite systems”**

335. *Background.* Section 25.159(a) prohibits a party with five pending license applications on file with the Commission for operation of “GSO-like” space stations<sup>771</sup> in a particular frequency band, or five licenses for unbuilt GSO-like space stations in a particular frequency band, or a number of such pending applications and licenses amounting to five in total, from applying for a license for operation of another GSO-like space station in the same frequency band.<sup>772</sup> The first sentence of Section 25.137(d)(5) imposes the same limits on requests for U.S. market access via non-U.S. licensed space stations.<sup>773</sup> In the *Further Notice*, we requested comment on a recommendation by SIA and EchoStar to delete Section 25.159(a).<sup>774</sup> They maintained that the rule is unnecessary, because the Commission’s bond and milestone rules and the “Three-Strikes” rule in Section 25.159(d) suffice to accomplish the underlying objective of preventing spectrum warehousing. They also argued that the limits in Section 25.159(a) unduly hinder financing and implementation of fleet upgrades or expansion and also limit options for international coordination.

336. *Discussion.* SIA and EchoStar continue to support deletion of Section 25.159(a).<sup>775</sup> In addition, EchoStar argues that the “Three-Strikes” rule in Section 25.159(d) is likewise unnecessary and

<sup>766</sup> Intelsat Comments at 36-37; Iridium Comments at 4; Iridium Reply at 5-6.

<sup>767</sup> Inmarsat Comments at 5; DIRECTV Reply at 7.

<sup>768</sup> See Appendix B, *infra* (Section 25.140(a)(1)).

<sup>769</sup> *Further Notice*, 29 FCC Rcd at 12168, ¶ 182.

<sup>770</sup> EchoStar Comments at 62.

<sup>771</sup> The term “GSO-like satellite system” is defined in Section 25.158 as a GSO satellite designed to communicate with earth stations with directional antennas.

<sup>772</sup> 47 C.F.R. § 25.159(a); see also *Space Station Licensing Reform Order*, 18 FCC Rcd at 10846-49, ¶¶ 228-33.

<sup>773</sup> 47 C.F.R. § 25.137(d)(5); see also *Space Station Licensing Reform Order*, 18 FCC Rcd at 10876, ¶ 313.

<sup>774</sup> *Further Notice*, 29 FCC Rcd at 12168, ¶ 183.

<sup>775</sup> SIA Reply, Exhibit 3 at 49; EchoStar Comments at 62-63.

should be removed.<sup>776</sup> Commenters also addressed the application limits in Section 25.159(a) and (d) in relation to our two-step application proposals, which are discussed above.<sup>777</sup>

337. We adopt the proposal of SIA and EchoStar to delete Section 25.159(a).<sup>778</sup> Our experience has been that the general limit on pending license applications for GSO-like space stations is unnecessary to deter warehousing of spectrum and orbital resources, in light of the bond and milestone requirements and other safeguards. Further, the record in this proceeding supports a conclusion that the restriction on additional license applications could inhibit opportunities for expansion of large satellite fleets.<sup>779</sup> The proposal to eliminate the limit elicited no opposition, nor did any commenters suggest that this rule was needed to prevent speculation and warehousing. Accordingly, we eliminate the limit of five GSO-like satellite applications or unbuilt satellites in any frequency band. For the same reasons, we delete the first sentence of Section 25.137(d)(5), which contains identical restrictions on space station market access requests.<sup>780</sup>

338. We will not adopt EchoStar's proposal to remove the "Three-Strikes" rule in Section 25.159(d), which we did not seek comment on in the *Further Notice*. The "Three-Strikes" rule may provide an important additional deterrent against speculation under the new escalating bond and single milestone requirements that we are adopting. We may revisit this issue after experience under the new regime.

**AA. Section 25.163 "Reinstatement"**

339. We proposed to change "insure" to "ensure" in Section 25.163(a)(3), which refers to "procedures ... established to insure timely filings in the future." SIA supports this change.<sup>781</sup> We adopt this rule change because it helps to clarify the rule.

**BB. Section 25.165 "Posting of bonds"**

340. Section 25.165(a) exempts from the bond-posting requirement licensees of "replacement" satellites, as defined in Section 25.165(e). Based upon a recommendation by ORBCOMM, we proposed in the *Further Notice* to clarify that such replacement satellites include NGSO satellites as well as GSO satellites.<sup>782</sup> We also proposed to amend the definition of "replacement satellite" to include GSO satellites authorized for operation at orbital locations within  $\pm 0.15^\circ$  of the satellites that they are to replace. Planet Labs and Spire support clarifying that the exception for replacement satellites also applies to NGSO satellites.<sup>783</sup> We adopt this proposal, which will make clear that authorizations for replacement NGSO

<sup>776</sup> See EchoStar Comments at 23-24.

<sup>777</sup> See Section IV.A.5., *supra*.

<sup>778</sup> This is consistent with our decision, above, to adopt a limit of five on pending API filing requests that are not accompanied by a Coordination Request submission and an application-stage bond. That limit is not designed to deter speculation in the Commission's licensing process. See *id*.

<sup>779</sup> See EchoStar Comments at 62 ("The size of satellite fleets today and the long lead times for satellite procurement activities means that even a limit of five applications in a particular frequency band can materially hinder an operator.").

<sup>780</sup> Removing the identical limit on requests for U.S. market access is a logical outgrowth of our proposal to delete Section 25.159(a), as the same policy objectives and similar considerations underlie the two rules. See generally *Space Station Licensing Reform Order*, 18 FCC Rcd at 10876, ¶ 313. It is also consistent with the general parity afforded to Commission space station licenses and market access recipients, and with the U.S. commitments under the WTO Basic Telecom Agreement. See generally *Fourth Protocol to the General Agreement on Trade in Services (GATS)*, 36 I.L.M. 336 (1997).

<sup>781</sup> SIA Reply, Exhibit 3 at 49.

<sup>782</sup> *Further Notice*, 29 FCC Rcd at 12168-69, ¶ 185.

<sup>783</sup> Planet Labs Comments at 4; Spire Comments at 3.

satellites are not subject to the bond requirement.<sup>784</sup> We also adopt our proposal to exempt replacement GSO satellites authorized at orbital locations within  $\pm 0.15^\circ$  of the existing satellites, which will provide additional flexibility to licensees seeking to replace existing space stations without significantly affecting the interference environment.<sup>785</sup>

**CC. Section 25.202 “Frequencies, frequency tolerance, and emission limits”**

341. *Background.* Section 25.202(g) states that telemetry, tracking, and command (TT&C) functions must be conducted “at either or both edges of the allocated band(s).” We proposed to amend this provision to allow licensees to transmit non-emergency TT&C signals in portions of their assigned spectrum other than at the band edges, provided that such TT&C operation will cause no more interference or require greater protection from interference than ordinary communications traffic on the same satellite network.<sup>786</sup> We also proposed to restore an annotation in Section 25.202(a)(1) that was inadvertently deleted in 2012.<sup>787</sup>

342. *Discussion.* All commenters on the issue support allowing mid-band TT&C operations.<sup>788</sup> EchoStar argues that such transmissions should be permitted if the off-axis EIRP density levels are consistent with two-degree spacing rules, but opposes high-power, emergency TT&C transmissions mid-band.<sup>789</sup> Intelsat asserts that emergency TT&C operations should also be allowed in frequencies not at the band edge if they, too, cause no greater interference and require no greater protection than ordinary service traffic. Intelsat further argues that mid-band TT&C operations should be permitted if they have been coordinated with co-frequency GSO space station operators within six degrees.<sup>790</sup> Regarding the annotations in Section 25.202(a)(1), SIA supports reinsertion of the deleted note and suggests two other corrections.<sup>791</sup>

343. We adopt Intelsat’s proposal. Thus, we will allow additional emergency and non-emergency TT&C operations anywhere within the assigned bands if such operations cause no more interference and require no greater protection than the ordinary communications traffic, or if such operations with a GSO space station have been coordinated with co-frequency space stations authorized within six degrees. We agree with Intelsat that allowing such TT&C transmissions will provide operators greater flexibility while continuing to protect other satellite networks from harmful interference. Accordingly, we do not believe it is necessary to restrict all mid-band TT&C operations to routine two-degree levels to ensure compatible operation.<sup>792</sup> In addition, we will allow emergency mid-band TT&C to

<sup>784</sup> Such NGSO replacements use the same frequency bands and orbital parameters as the satellite being replaced, but need not be technically identical to it. Technically identical replacements are generally authorized under an existing blanket NGSO space station license. *See* note 323, *supra*; Appendix B, *infra* (Section 25.113(i)).

<sup>785</sup> This is consistent with our decisions above to streamline space station relocations within  $\pm 0.15^\circ$  of an orbital location assigned to the satellite operator. *See* Section IV.Q.2., *supra*.

<sup>786</sup> *Further Notice*, 29 FCC Rcd at 12169, ¶ 187. This amendment would, for example, allow use of mid-band beacons to facilitate earth station antenna tracking and accurate satellite beam pointing. *Id.* As noted in the *Further Notice*, we also considered this amendment in the *2013 Report and Order*, but declined to adopt it on the basis of insufficient record support. *See 2013 Report and Order*, 28 FCC Rcd at 12455, ¶ 170.

<sup>787</sup> *Further Notice*, 29 FCC Rcd at 12169, ¶ 186.

<sup>788</sup> *See* EchoStar Comments at 63-64; Iridium Comments at 2-3; Intelsat Comments at 35-36; Intelsat Reply at 13; SES Reply at 18.

<sup>789</sup> EchoStar Comments at 63-64.

<sup>790</sup> Intelsat Comments at 35-36; Intelsat Reply at 13; *see also* SES Reply at 18.

<sup>791</sup> SIA Comments at 22; SIA Reply, Exhibit 3 at 51. Specifically, SIA states that notes 6 and 7, which apply to the 29.1-29.25 GHz and 29.25-29.5 GHz bands, respectively, should limit the co-primary designation to NGSO MSS feeder links to reflect precisely the Commission’s designation of these bands.

<sup>792</sup> We assume that coordinated operations are compatible.



the same extent as non-emergency operation, as doing so will not affect the interference potential or susceptibility to interference of the transmissions. Because high-power or highly sensitive TT&C operations will continue to be limited to the edges of the band, unless previously coordinated, we expect that omnidirectional space station antennas used for TT&C will be capable of operating at a band edge in the future.

344. In addition, we amend Section 25.202(a)(1) to reinstate the note that was inadvertently deleted in 2012, and to adopt the corrections to notes 6 and 7 in this Section suggested by SIA.<sup>793</sup> We also take this opportunity to delete notes 1 and 2 in Section 25.202(a)(1). Note 1 states that “[t]he 18.3-18.58 GHz band is shared co-equally with existing terrestrial radiocommunication systems until November 19, 2012,” and is obsolete. Note 2 states that FSS is secondary to the Local Multipoint Distribution Service in 18.3-18.58 GHz band, which it is not.<sup>794</sup>

**DD. Section 25.203 “Choice of sites and frequencies”**

345. We proposed several minor changes to remove unnecessary text in Section 25.203(g)(1), delete a redundant requirement in Section 25.203(j), and rationalize a notification requirement in Section 25.203(f).<sup>795</sup> SIA supports all of our proposals in this Section,<sup>796</sup> which we adopt for the reasons stated in the *Further Notice*.

**EE. Operating Rules for Earth Stations**

**1. Section 25.204 “Power limits for earth stations”**

346. As explained in the *Further Notice*,<sup>797</sup> Section 25.204(e)(1) states that the EIRP and EIRP density of FSS earth station transmissions in frequencies above 10 GHz not subject to other subparagraphs of Section 25.204(e) may exceed normal limits by 1 dB above the amount of monitored rain-fade attenuation during periods of precipitation. Section 25.204(e)(1) also states that the maximum power level must be coordinated with operators of space stations adjacent to the target satellite. Based on a recommendation by SIA, we proposed in the *Further Notice* to delete the coordination requirement as unnecessary in light of the 1 dB limit. SIA and EchoStar support our proposal,<sup>798</sup> which we adopt to remove an unnecessary requirement.

**2. Section 25.205 “Minimum angle of antenna elevation”**

347. *Background.* We proposed to amend Section 25.205(a) and (d) to permit routine authorization of earth station operation at elevation angles as low as three degrees above the horizontal

<sup>793</sup> Because these corrections merely clarify the Ka-band Plan designations reflected in the annotations, we find good cause to conclude that the notice and comment requirements of the APA are unnecessary for their adoption. *See, e.g., 28 GHz First Report and Order*, 11 FCC Rcd at 19025, ¶ 45 (designating the 29.1-29.25 GHz band for *NGSO* MSS feeder links on a co-primary basis), 19029, ¶ 57 (designating the 29.25-29.5 GHz band for *NGSO* MSS feeder links on a co-primary basis).

<sup>794</sup> *See Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use*, IB Docket No. 98-172, Second Order on Reconsideration, 17 FCC Rcd 24248 (2002) (reallocating the 18.3-18.58 GHz band for sole primary FSS use) (*18 GHz Second Reconsideration Order*); *2006 Biennial Regulatory Review – Revision of Part 25*, IB Docket No. 06-154, Report and Order, 27 FCC Rcd 11585, 11589-90, ¶ 18 (adding note 2) (2012). We find there is good cause to remove notes 1 and 2 from Section 25.202(a)(1) without prior notice and the opportunity for comment, as doing so will simply remove an outdated annotation and an erroneous annotation.

<sup>795</sup> *Further Notice*, 29 FCC Rcd at 12170, ¶¶ 188-90.

<sup>796</sup> SIA Reply, Exhibit 3 at 52-54.

<sup>797</sup> *Further Notice*, 29 FCC Rcd at 12170-71, ¶ 191.

<sup>798</sup> SIA Reply, Exhibit 3 at 54-55; EchoStar Comments at 64.

plane, from the current five-degree minimum for non-seaward transmissions, in frequency bands not shared with terrestrial radio systems.<sup>799</sup> This change would align these rules with an ITU regulation.<sup>800</sup> We also proposed to delete Section 25.205(b) and (c), which are redundant with Section 25.204(h), (i), and (j), and to re-order the wording of the Section 25.205 heading.<sup>801</sup>

348. *Discussion.* SIA supports all of our proposed amendments to Section 25.205.<sup>802</sup> EchoStar, however, argues that the five-degree minimum elevation angle should be retained in bands where satellite networks operate bidirectionally (e.g., 17.3-17.8 GHz) as well as in bands shared with terrestrial services.<sup>803</sup> EchoStar notes that lowering the elevation angle of transmission in bands with bidirectional transmissions could result in higher EIRP densities being radiated toward the horizon, thereby extending the distance at which a receiving earth station in the same band could be safely deployed. For transmission in other bands, EchoStar contends that no minimum elevation angle is needed, because a reduction in transmission angle would not create interference for other parties.

349. We adopt a minimum elevation angle of five degrees above the horizon for earth station transmission in bands shared with terrestrial services on a co-primary basis or in bands in which satellite networks operate bidirectionally with equal rights. We adopt a minimum elevation angle requirement of three degrees in all other bands. We agree with EchoStar that the elevation angle of a transmitting earth station can affect coordination with co-frequency receiving earth stations as well as co-frequency terrestrial facilities. Accordingly, we maintain the five-degree limit in such shared bands. We also agree that transmission at low elevation angles will not increase the potential for co-frequency interference in bands not shared with terrestrial services or space-to-Earth transmissions. However, we do not have a complete record on the full effects of routinely authorizing earth station transmission at elevation angles down to zero degrees above the horizon. Further, requests for such operation are relatively infrequent. Therefore, we will maintain the current three-degree minimum elevation, and will evaluate individual waiver requests on a case-by-case basis. Finally, we also adopt our proposal to delete redundant paragraphs in Section 25.205 and to modify the Section title, which should make the rule clearer.

### 3. Section 25.211 “Analog video transmissions in the Fixed-Satellite Service”

350. Section 25.211(a) requires the center frequencies of analog video carriers in the 3700-4200 MHz downlink band to be spaced at 20 MHz intervals starting at 3720 MHz and requires the corresponding uplink center frequencies to be 2225 MHz higher. We proposed to eliminate this rule, noting that operators have coordinated operation not conforming to these requirements and that adherence to the formula by operations using bandwidths other than 36 MHz or multiples thereof would result in inefficient transponder utilization.<sup>804</sup> The only commenter on this issue, SIA, supports this proposal,<sup>805</sup> which we adopt to afford more design flexibility for space stations transmitting analog video signals in the 3700-4200 MHz band.

351. Section 25.211(b) prohibits transmission of an unmodulated carrier at a power level sufficient to saturate a satellite transponder, except by the space station licensee for testing purposes.

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<sup>799</sup> *Further Notice*, 29 FCC Rcd at 12171, ¶ 192. We noted that authority for operation at elevation angles below three degrees might be granted in response to a waiver request supported by a demonstration of good cause. *Id.*; see also 47 C.F.R. § 1.3 (waiver provision).

<sup>800</sup> See ITU Radio Regulations, No. 21.14 (specifying three degree minimum elevation angle for earth station antennas unless otherwise agreed in international coordination).

<sup>801</sup> See *Further Notice*, 29 FCC Rcd at 12171, ¶ 193.

<sup>802</sup> SIA Reply, Exhibit 3 at 55-56.

<sup>803</sup> See EchoStar Reply at 9-10, Appendix A at 8-9.

<sup>804</sup> *Further Notice*, 29 FCC Rcd at 12171-72, ¶ 195.

<sup>805</sup> SIA Reply, Exhibit 3 at 66-67.

Based on a suggestion by SIA, we proposed to apply this rule to all earth station operation, not just analog video uplink transmission in the 4/6 GHz FSS band, and, therefore, to move the provision to Section 25.275 as a rule of general applicability.<sup>806</sup> The only commenter on this issue, SIA, supports this proposal,<sup>807</sup> which we adopt to apply generally this limitation on potentially harmful transmissions. In addition, we will remove the restriction that the earth station transmission must be conducted by the space station licensee itself. We believe it is sufficient that the space station licensee consent to the testing transmission.

352. Section 25.211(b) states that “12/14 GHz video transmissions for TV/FM shall identify the particular carrier frequencies for necessary coordination with adjacent U.S. satellite systems and affected satellite systems of other administrations.” We proposed to delete this sentence, because any specification of carrier frequencies necessary for coordination can be directly addressed by operators in the course of the coordination.<sup>808</sup> The only commenter on this issue, SIA, supports this proposal,<sup>809</sup> which we adopt to remove a Commission requirement that is no longer necessary.

#### 4. Section 25.258 “Sharing between NGSO MSS Feeder links Stations and GSO FSS services in the 29.25-29.5 GHz bands”

353. *Background.* In 2001, the Commission amended Section 25.258(b) to require GSO FSS earth stations transmitting in the 29.25-29.5 GHz band in the vicinity of operational or planned NGSO MSS feeder-link earth station complexes to operate, to the extent possible, with frequencies and polarization that will minimize “unacceptable interference with GSO FSS *or* NGSO MSS uplink reception” (emphasis added).<sup>810</sup> The reference to NGSO MSS was later inadvertently deleted.<sup>811</sup> We proposed to reinstate this text.<sup>812</sup>

354. *Discussion.* No party objects to our proposal. EchoStar and Inmarsat, each supported by SES,<sup>813</sup> advocate other changes to Section 25.258. EchoStar recommends deleting the words “or planned” from Section 25.258(b), so that licensed GSO FSS earth stations need not adjust their operations to take into account “planned” NGSO MSS feeder link earth stations.<sup>814</sup> EchoStar and SES argue that the requirement is vague and does not reflect the co-equal status of GSO FSS and NGSO MSS feeder links in the band, as there is no corresponding requirement to consider planned GSO FSS earth stations. Inmarsat argues that past coordination under Section 25.258 has taken significantly longer than should be expected, and proposes that the Commission adopt a one-year “shot clock” on such coordination, after which time the Commission would intervene to resolve any outstanding matters.<sup>815</sup> Iridium opposes both proposals.<sup>816</sup> Iridium argues that the requirement to consider “planned” NGSO MSS feeder-link locations

<sup>806</sup> *Further Notice*, 29 FCC Rcd at 12172, ¶ 196.

<sup>807</sup> SIA Reply, Exhibit 3 at 67, 129.

<sup>808</sup> *Further Notice*, 29 FCC Rcd at 12172, ¶ 197.

<sup>809</sup> SIA Reply at 67.

<sup>810</sup> *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission’s Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, IB Docket No. 92-297, Memorandum Opinion and Order, 16 FCC Rcd 11436, 11441, ¶ 13 (2001), 67 FR 39308 (June 7, 2002).

<sup>811</sup> *See 18 GHz Second Reconsideration Order*, 17 FCC Rcd 24248.

<sup>812</sup> *Further Notice*, 29 FCC Rcd at 12172, ¶ 198.

<sup>813</sup> SES Reply at 17-18.

<sup>814</sup> *See* EchoStar Comments at 64-65; *see also* EchoStar Reply, Appendix A at 9.

<sup>815</sup> Inmarsat Comments at 5-6.

<sup>816</sup> Iridium Reply at 10-11.

provides needed flexibility to NGSO MSS operators to deploy additional stations in the future. Iridium also argues that a “shot clock” on coordination is unnecessary, because parties can always request Commission intervention, and that imposing an artificial time limit could be counter-productive to coordination discussions.

355. We adopt our proposal to reinsert in Section 25.258(b) the reference to protection of NGSO MSS uplink reception, which will correct an inadvertent deletion. We agree with EchoStar and SES that a requirement to consider “planned” NGSO MSS feeder-link locations is unduly vague and, to the extent it implies operations that are not applied for, does not reflect the co-equal status of GSO FSS and NGSO MSS feeder-link operations in the 29.25-29.5 GHz band. We also believe that the requirement to coordinate with existing applicants under Section 25.203(h) provides sufficient flexibility for NGSO MSS system operators.<sup>817</sup> Accordingly, we delete “or planned” from Section 25.258(b).<sup>818</sup>

356. We decline, however, to adopt Inmarsat’s proposed one-year “shot clock” on coordination under Section 25.258. We believe this change is unnecessary, and note that adoption of a “shot clock” on coordination under Section 25.258 would not affect similar coordination requirements under other Commission rules.<sup>819</sup>

#### **FF. Section 25.283 “End-of-life disposal”**

357. *Background.* Section 25.283(c) provides that after relocating a satellite to a post-mission disposal orbit, the licensee must ensure, unless prevented by technical failures beyond its control, that “all stored energy sources on board the satellite are discharged, by venting excess propellant, discharging batteries, relieving pressure vessels, and other appropriate measures.”<sup>820</sup> In the *Further Notice*, we invited comment on a recommendation by SIA to change the phrase “and other appropriate measures” to “or other appropriate measures.”<sup>821</sup> SIA proposed this amendment to addresses spacecraft that do not fully vent all pressure vessels at end of life.<sup>822</sup> SIA argued that the change would more closely align Section 25.283(c) with the related disclosure provision in Section 25.114(d)(14)(ii)<sup>823</sup> and with U.S. Government guidelines.<sup>824</sup> A comprehensive technical standard developed by the National Aeronautics and Space Administration (NASA) in this area also permits spacecraft designs that include a plan to control all onboard sources of stored energy “to a level which can not cause an explosion or deflagration large

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<sup>817</sup> See 47 C.F.R. § 25.203(h).

<sup>818</sup> This action is a logical outgrowth of our proposal to amend Section 25.258(b) to extend protection to NGSO MSS uplink transmissions.

<sup>819</sup> See, e.g., 47 C.F.R. § 25.203(h), (k).

<sup>820</sup> 47 C.F.R. § 25.283(c).

<sup>821</sup> *Further Notice*, 29 FCC Rcd at 12172-73, ¶ 199. SIA has also filed a request for blanket waiver of Section 25.283(c) with respect to in-orbit satellites incapable of completely venting excess propellant and relieving pressure vessels at end of life. See *Pleading Cycle Established for Comment on Satellite Industry Association’s Blanket Waiver Request Concerning Relieving Satellite Pressure Vessels*, IB Docket No. 02-54, Public Notice, 25 FCC Rcd 16982 (rel. Dec. 14, 2010). That request remains pending.

<sup>822</sup> Comments of the Satellite Industry Association filed Jan. 14, 2013, at 30.

<sup>823</sup> Section 25.114(d)(14)(ii) requires a space station applicant to state whether stored energy will be removed at the spacecraft’s end of life, by depleting residual fuel and leaving all fuel line valves open, venting any pressurized system, leaving all batteries in a permanent discharge state, and removing any remaining source of stored energy, “or through other equivalent procedures specifically disclosed in the application.” 47 C.F.R. § 25.114(d)(14)(ii).

<sup>824</sup> See *Mitigation of Orbital Debris*, IB Docket No. 02-54, Notice of Proposed Rule Making, 17 FCC Rcd 5586, 5616, Appendix A (U.S. Government Orbital Debris Mitigation Standard Practices, Section 2-2) (*Orbital Debris NPRM*).

enough to release orbital debris or break up the spacecraft.<sup>825</sup> The International Bureau has consulted the *NASA Standard*, among other authorities, when considering requests for partial waiver of the venting requirements in our rules. In connection with SIA's proposal, the *Further Notice* also invited suggestions for specific alternative requirements for spacecraft with pressure vessels that cannot be completely discharged.<sup>826</sup> No commenter opposes relaxing the requirement in Section 25.283(c).

358. *Discussion.* SIA, Boeing, DIRECTV, and EchoStar support SIA's recommendation in the *Further Notice* that would permit spacecraft to maintain residual propellant or pressurant at the end of their operational life.<sup>827</sup> Boeing and EchoStar note that the design features of some satellite buses, such as pyrotechnic valves associated with the propellant system, can increase system reliability but preclude complete venting of residual propellant or pressurant at end of life. Boeing states that a typical value for such designs is residual pressure of less than five percent of the burst pressure of the vessel. Given the use of other safety measures such as shielding and "leak-before-burst" construction, Boeing argues that spacecraft systems maintaining residual pressure can provide the same degree of orbital debris mitigation as systems that can be fully depleted. Iridium also supports relaxing the requirement in Section 25.283(c), and proposes that the Commission specify that excess reactive propellants must be vented to the minimum residuals reasonably possible and that inert propellants must be vented by relieving pressure vessels to no more than 15 or 20% of the system burst pressure.<sup>828</sup>

359. We modify Section 25.283(c) to permit a satellite to maintain *de minimis* propellant or pressurant upon disposal. We agree with commenters that this change will make our rule more consistent with the U.S. Government Orbital Debris Mitigation Standard Practices.<sup>829</sup> It is also consistent with the *NASA Standard*.

360. Specifically, we modify Section 25.283(c) to delete the word "all" in "all stored energy sources,"<sup>830</sup> and change "and other appropriate measures" to "or other appropriate measures" as proposed by SIA. Iridium has provided no technical basis for its proposal, which would routinely allow residual pressure of more than three or four times the amount that Boeing has indicated is typical in spacecraft not designed for complete venting at end of life. We, therefore, decline to adopt Iridium's proposal.

361. We will continue to receive information in space station applications under Section 25.114(d)(14)(ii) concerning the applicant's intention to comply with the modified operational requirement in Section 25.283(c).<sup>831</sup> We expect to rely on technical guidance from other sources,

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<sup>825</sup> See NASA Technical Standard, Process for Limiting Orbital Debris, NASA-STD-8719.14A (with Change 1) at 27 (Requirement 4.4-2) (May 25, 2012) (*NASA Standard*), available at <http://www.hq.nasa.gov/office/codeq/doctree/871914.pdf>.

<sup>826</sup> *Further Notice*, 29 FCC Rcd at 12172-73, ¶ 199.

<sup>827</sup> See SIA Reply, Exhibit 3 at 129; Boeing Comments at 14-16; DIRECTV Reply at 8-9; EchoStar Comments at 65-66.

<sup>828</sup> See Iridium Comments at 7; Iridium Reply at 8-9. DIRECTV also supports Iridium's proposal, as an alternative to the proposal by SIA included in the *Further Notice*. See DIRECTV Reply at 9.

<sup>829</sup> See *Orbital Debris NPRM*, 17 FCC Rcd at 5616, Appendix A (U.S. Government Orbital Debris Mitigation Standard Practices, Section 2-2) (providing that all on-board sources of stored energy of a spacecraft should be depleted "or safed" when they are no longer required for mission operations or postmission disposal). While this guideline was in place at the time the Commission adopted Section 25.283(c), no rationale is apparent for the departure from U.S. Government standards. See generally *Mitigation of Orbital Debris*, IB Docket No. 02-54, Second Report and Order, 19 FCC Rcd 11567, 11580-82, ¶¶ 29-33, 11622, Appendix B, ¶ 12 (2004); *Orbital Debris NPRM*, 17 FCC Rcd at 5602-03, ¶¶ 39-40, 5621, Appendix B, ¶ 5.

<sup>830</sup> We believe this additional change is necessary to implement SIA's intent, since requiring discharge of all stored energy sources would preclude the satellite from maintaining residual propellant or pressurant.

<sup>831</sup> We note that information required by Section 25.114(d)(14)(ii) may be used for purposes other than assessing the probability of accidental explosions; for example, information concerning residual energy in the propulsion system

(continued....)



including the *NASA Standard* and any revisions thereof, to determine whether a space station license applicant's plan to deplete onboard sources of stored energy at satellite end of life will comply with Section 25.283(c).<sup>832</sup>

**GG. Miscellaneous Administrative Correction**

362. Section 25.257(e) references certain categories of "protection zone[s]" for NGSO MSS feeder-link earth station complexes in the 29.1-29.25 GHz band "identified in §101.147(c)(2) of this chapter."<sup>833</sup> The categories are instead found in Section 101.147(y)(2). We correct this cross-reference in Section 25.257(e).

**HH. Pending Applications**

363. We will apply the rules and procedures we adopt in this Second Report and Order to pending space station and earth station applications. The Commission may apply new procedures to pending applications under limited circumstances if doing so does not impair the rights an applicant possessed when it filed its application, increase an applicant's liability for past conduct, or impose new duties on applicants with respect to transactions already completed.<sup>834</sup> Applicants do not gain any vested right merely by filing an application, and the simple act of filing an application is not considered a "transaction already completed" for purposes of this analysis.<sup>835</sup> Applying our new rules and procedures to pending space station applications will not impair the rights any applicant had at the time it filed its application. Nor will doing so increase an applicant's liability for past conduct. In fact, pending applicants will benefit when the streamlining actions we adopt here, including the modified milestone and bond requirements, come into force.

**V. REGULATORY IMPACT CONCLUSION**

364. The amendments we adopt here update the Commission's rules for satellite services to reflect evolving technology, eliminate unnecessary technical and information-filing requirements, and reorganize, clarify, and simplify existing requirements. These changes will serve the public interest by

(Continued from previous page) \_\_\_\_\_  
may give a better understanding of potential sources of orbital perturbations that may affect the reliability of predictions of a retired satellite's orbit.

<sup>832</sup> See *NASA Standard* at 29-30.

<sup>833</sup> See 47 C.F.R. § 101.147(y)(2); 28 *GHz First Report and Order*, 11 FCC Rcd at 19033-34, ¶¶ 69-70, 19068-69, Appendix B, ¶ 9 (added text of Section 101.147).

<sup>834</sup> See *Landgraf v. USI Film Products*, 511 U.S. 244, 280 (1994); *DirecTV, Inc., v. FCC*, 110 F.3d 816, 825-26 (D.C. Cir., 1997); *Revisions to Parts 2 and 25 of the Commission's Rules to Govern the Use of Earth Stations Aboard Aircraft Communicating with Fixed-Satellite Service Geostationary-Orbit Space Stations Operating in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands*, IB Docket No. 12-376, Report and Order, 27 FCC Rcd 16510, 16553, ¶ 115 n.279 (2012).

<sup>835</sup> *Chadmoore Communications, Inc. v. FCC*, 113 F.3d 235, 240-41 (D.C. Cir. 1997) ("In this case the Commission's action did not increase [the applicant's] liability for past conduct or impose new duties with respect to completed transactions. Nor could it have impaired a right possessed by [the applicant] because none vested on the filing of its application."); *Hispanic Info. & Telecomms. Network v. FCC*, 865 F.2d 1289, 1294-95 (D.C. Cir. 1989) ("The filing of an application creates no vested right to a hearing; if the substantive standards change so that the applicant is no longer qualified, the application may be dismissed."); *Schraier v. Hickel*, 419 F.2d 663, 667 (D.C. Cir. 1969) (filing of application that has not been accepted does not create a legal interest that restricts discretion vested in agency); see also *United States v. Storer Broadcasting Co.*, 351 U.S. 192 (1952) (pending application for new station dismissed due to rule change limiting the number of licenses that could be held by one owner); *Bachow Communications, Inc. v. FCC*, 237 F.3d 683, 686-88 (D.C. Cir. 2001) (upholding freeze on new applications and dismissal of pending applications in light of adoption of new licensing scheme); *PLMRS Narrowband Corp. v. FCC*, 182 F. 3d 995, 1000-01 (D.C. Cir. 1999) (applicant did not, by virtue of filing application, obtain the right to have it considered under the rules then applicable).

promoting compliance with the Commission's operating rules, improving the ability of the public and Commission to assess the interference potential of proposed operations, affording more flexibility for incorporating state-of-the-art design, easing administrative burdens, and facilitating rapid deployment of new and improved satellite services. We conclude that these benefits will outweigh any resultant costs and that the rule changes would reduce net costs, on average, for applicants and licensees.

## **VI. PROCEDURAL MATTERS**

### **A. Regulatory Flexibility Act**

365. Pursuant to the Regulatory Flexibility Act of 1980, as amended,<sup>836</sup> the Commission's Final Regulatory Flexibility Analysis in this Report and Order is attached as Appendix C.

### **B. Paperwork Reduction Act**

366. This document contains new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding.

367. Pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4), we previously sought specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees. We received no comments on this issue. We have assessed the effects of the revisions adopted that might impose information collection burdens on small business concerns, and find that the impact on businesses with fewer than 25 employees will be an overall reduction in burden. The amendments adopted in this Report and Order eliminate unnecessary information filing requirements for licensees and applicants; eliminate unnecessary technical restrictions and enable applicants and licensees to conserve time, effort, and expense in preparing applications and reports. Overall, these changes may have a greater positive impact on small business entities with more limited resources.

### **C. Congressional Review Act**

368. The Commission will send copies of this Report and Order to Congress and the General Accountability Office pursuant to the Congressional Review Act, 5 U.S.C. § 801(a)(1)(A), and will send a copy including the final regulatory flexibility act analysis to the Chief Counsel for Advocacy of the Small Business Administration, in accordance with Section 603(a) of the Regulatory Flexibility Act, 5 U.S.C. § 601, et seq. (1981).

## **VII. ORDERING CLAUSES**

369. IT IS ORDERED, pursuant to Sections 4(i), 7(a), 10, 11, 303(c), 303(f), 303(g), 303(r), and 308(b) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 157(a), 160, 161, 303(c), 303(f), 303(g), 303(r), 308(b), that this Report and Order IS ADOPTED, the policies, rules, and requirements discussed herein ARE ADOPTED, and Part 25 of the Commission's rules IS AMENDED as set forth in Appendix B.

370. IT IS FURTHER ORDERED that the International Bureau is delegated authority to issue Public Notices consistent with this Report and Order.

371. IT IS FURTHER ORDERED that the International Bureau will issue a Public Notice announcing the effective date for all of the changes adopted in this Report and Order.

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<sup>836</sup> 5 U.S.C. § 601 et. seq.

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

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch  
Secretary

**APPENDIX A**  
**List of Commenters**

**Commenters**

AvL Technologies, Inc. (AvL)  
The Boeing Company (Boeing)  
DIRECTV, LLC (DIRECTV)  
EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC (filing jointly) (EchoStar)  
The Global VSAT Forum (GVF)  
Inmarsat  
Intelsat License LLC (Intelsat)  
Iridium Constellation LLC (Iridium)  
Kymeta Corporation (Kymeta)  
Microcom  
Nanosatisfi, Inc. d/b/a Spire Global, Inc. (Spire)  
Planet Labs Inc.  
The Satellite Industry Association (SIA)  
SES Americom, Inc. and New Skies Satellites B.V. (filing jointly) (SES)  
The Surety & Fidelity Association of America (Surety Association)  
ViaSat, Inc.

**Reply Commenters**

DIRECTV, LLC  
EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC (filing jointly)  
Intelsat License LLC  
Iridium Constellation LLC  
Planet Labs Inc.  
The Satellite Industry Association  
SES Americom, Inc. and New Skies Satellites B.V. (filing jointly)  
Space Exploration Technologies Corp.  
Spire Global, Inc.  
O3b Limited (O3b)  
ViaSat, Inc.

**APPENDIX B****Final Rules**

The Federal Communications Commission amends title 47 of the Code of Federal Regulations, parts 0 and 25, as follows:

**PART 0 – Commission Organization**

1. The authority citation for Part 0 continues to read as follows:

Authority: Sec. 5, 48 Stat. 1068, as amended; 47 U.S.C. 155, 225, unless otherwise noted.

2. In § 0.457, add paragraph (d)(1)(vii)(C) to read as follows:

§ 0.457 Records not routinely available for public inspection.

\* \* \* \* \*

(d) \* \* \*

(1) \* \* \*

(vii) \* \* \*

(C) APIs submitted pursuant to §25.111(e) and Coordination Requests filed pursuant to §25.110(b)(3)(i) are not routinely available for public inspection before the Commission submits the Coordination Request to the ITU. Submission of Coordination Requests to the ITU will be announced by public notice pursuant to §25.151(a)(9).

**PART 25 – SATELLITE COMMUNICATIONS**

3. The authority citation for Part 25 is revised to read as follows:

Authority: Interprets or applies 47 U.S.C. 154, 301, 302, 303, 307, 309, 310, 319, 332, 605, and 721 unless otherwise noted.

4. In § 25.103, add definitions of “conventional C-band,” “conventional Ka-band,” “conventional Ku-band,” “extended C-band,” “plane perpendicular to the GSO arc,” “plane tangent to the GSO arc,” “skew angle,” and “two-degree-compliant space station”; remove the definitions of “12/14 GHz band,” “20/30 GHz bands,” and “C band”; and revise the definitions of “extended Ku band,” “NGSO FSS gateway earth station,” “protection areas,” and “routine processing or licensing” to read as follows:

§25.103 Definitions.

\* \* \* \* \*

Conventional C-band. The 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space) FSS frequency bands.

Conventional Ka-band. The 18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space) frequency bands, which the Commission has designated as primary for GSO FSS operation.

Conventional Ku-band. The 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) FSS frequency bands.



\* \* \* \* \*

Extended C-band. The 3600-3700 MHz (space-to-Earth), 5850-5925 MHz (Earth-to-space), and 6425-6725 MHz (Earth-to-space) FSS frequency bands.

\* \* \* \* \*

Extended Ku-band. The 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), and 13.75-14.0 GHz bands (Earth-to-space) FSS frequency bands.

\* \* \* \* \*

NGSO FSS gateway earth station. An earth station or complex of multiple earth station antennas that supports the routing and switching functions of an NGSO FSS system and that does not originate or terminate communication traffic. An NGSO FSS gateway earth station may also be used for telemetry, tracking, and command transmissions and is not for the exclusive use of any customer.

\* \* \* \* \*

Plane perpendicular to the GSO arc. The plane that is perpendicular to the “plane tangent to the GSO arc,” as defined below, and includes a line between the earth station in question and the GSO space station that it is communicating with.

Plane tangent to the GSO arc. The plane defined by the location of an earth station’s transmitting antenna and a line in the equatorial plane that is tangent to the GSO arc at the location of the GSO space station that the earth station is communicating with.

\* \* \* \* \*

Protection areas. The geographic regions where U.S. Department of Defense meteorological satellite systems or National Oceanic and Atmospheric Administration meteorological satellite systems, or both such systems, receive signals from low earth orbiting satellites. Also, areas around NGSO MSS feeder-link earth stations in the 1.6/2.4 GHz Mobile-Satellite Service determined in the manner specified in §25.203(j).

\* \* \* \* \*

Routine processing or licensing. Expedited processing of unopposed applications for earth stations in the FSS communicating with GSO space stations, satisfy the criteria in §§25.138(a), 25.211(d), 25.212(c), 25.212(d), 25.212(e), 25.212(f), 25.218, or 25.223(b), include all required information, are consistent with all Commission rules, and do not raise any policy issues. Some, but not all, routine earth station applications are eligible for an autogrant procedure under §25.115(a)(3).

\* \* \* \* \*

Skew angle. The angle between the minor axis of an axially asymmetric antenna beam and the plane tangent to the GSO arc.

\* \* \* \* \*

Two-degree-compliant space station. A GSO FSS space station operating in the conventional or extended C-bands, the conventional or extended Ku-bands, or the conventional Ka-band within the limits on downlink EIRP density or PFD specified in §25.140(a)(3) and communicating only with earth stations operating in conformance with routine uplink parameters specified in §§25.138(a), 25.211(d), 25.212(c), (d), or (f), 25.218, 25.221(a)(1) or (a)(3), 25.222(a)(1) or (a)(3), 25.226(a)(1) or (a)(3), or 25.227(a)(1) or (a)(3).

\* \* \* \* \*

5. In § 25.110, revise paragraphs (b) and (f) to read as follows:

§ 25.110 Filing of applications, fees, and number of copies.

\* \* \* \* \*

(b) Submitting your application.

(1) All earth station license applications must be filed electronically on FCC Form 312 in accordance with the applicable provisions of part 1, subpart Y of this chapter.

(2) Except as provided in paragraph (b)(3) of this section, applications for space station licenses must be filed electronically on FCC Form 312 in accordance with the applicable provisions of part 1, subpart Y of this chapter and include all information required by §25.114.

(3) A license application for 17/24 GHz BSS space station operation or for GSO FSS space station operation not subject to the provisions in Appendix 30A of the ITU's Radio Regulations may be submitted in two steps, as follows:

(i) An application for 17/24 GHz BSS space station operation or for GSO FSS space station operation not subject to the provisions in Appendix 30B of the ITU's Radio Regulations may be initiated by filing with the Commission, in accordance with the applicable provisions of part 1, subpart Y of this chapter, a draft Coordination Request and simplified Form 312 for the proposed operation and a declaration of acceptance of ITU cost-recovery responsibility in accordance with §25.111(d). The simplified Form 312, Main Form submission must include the information required by items 1-17, 43, 45, and 46.

(ii) An application for GSO FSS space station operation subject to the provisions in Appendix 30B of the ITU's Radio Regulations may be initiated by submitting to the Commission, in accordance with the applicable provisions of part 1, subpart Y of this chapter, a draft ITU filing to convert an allotment into an assignment, to introduce an additional system, or to modify an assignment in the Appendix 30B List accompanied by a simplified Form 312 and a declaration of acceptance of ITU cost-recovery responsibility in accordance with §25.111(d). The simplified Form 312, Main Form submission must include the information required by items 1-17, 43, 45, and 46. In addition, the applicant must submit the results of an analysis demonstrating that no U.S. filing under Appendix 30B would be deemed affected by the proposed operation under the relevant ITU criteria or, for any affected filings, a letter signed by the affected operator that it consents to the new filing.

(iii) An application initiated pursuant to paragraphs (b)(3)(i) or (ii) of this section will be considered completed by the filing of an FCC Form 312 and the remaining information required in a complete license application, including the information required by §25.114, within two years of the date of submission of the initial application materials.

\* \* \* \* \*

(f) An applicant must pay the appropriate filing fee in accordance with part 1, subpart G of this chapter, at the time when it files a FCC Form 312.

6. In § 25.111, revise the section heading and paragraph (d) to read as follows and add paragraph (e) and a note to paragraph (e):

§25.111 Additional information, ITU filings, and ITU cost recovery.

\* \* \* \* \*

(d) The Commission will submit filings to the ITU on behalf of an applicant, licensee, or other requesting party only after the party has filed a signed declaration of unconditional acceptance of all consequent ITU cost-recovery responsibility. Applicants and licensees must file the declaration electronically in the "Other Filings" tab of the application file in the IBFS database, and must also mail a paper copy to the International Bureau, Satellite Division. In addition, applicants and licensees must reference the call sign and name of the satellite network in the declaration. All cost-recovery declarations must include the

name(s), address(es), email address(es), and telephone number(s) of a contact person, or persons, responsible for cost recovery inquiries and ITU correspondence and filings. Supplements must be filed as necessary to apprise the Commission of changes in the contact information until the ITU cost-recovery responsibility is discharged. The applicant, licensee, or other party must remit payment of any resultant cost-recovery fee to the ITU by the due date specified in the ITU invoice, unless an appeal is pending with the ITU that was filed prior to the due date. A license granted in reliance on such a commitment will be conditioned upon discharge of any such cost-recovery obligation. Where an applicant or licensee has an overdue ITU cost-recovery fee and does not have an appeal pending with the ITU, the Commission will dismiss any application associated with that satellite network.

(e) The Commission will process and forward to the ITU up to five Advance Publication filings by an entity that are not accompanied by a complete space station license application or by an application pursuant to §25.110(b)(3)(i) or (ii). Such Advance Publication filing requests not contained in an application must be accompanied by a letter request and a signed ITU cost-recovery declaration pursuant to paragraph (d) of this section. A request for filing of Advance Publication information will be attributed to an entity in the same manner as a space station license application under the criteria set forth in §25.159(c).

NOTE TO PARAGRAPH (e): After June 30, 2016, the Commission will not forward Advance Publication information for satellite networks or systems subject to Article 9, Section II of the ITU Radio Regulations.

7. In § 25.112, revise the section heading, the first sentence in paragraph (b), and paragraph (c) to read as follows and add paragraph (d):

§ 25.112 Dismissal and return of applications.

\* \* \* \* \*

(b) Applications for space station authority found defective under paragraph (a)(3) or (a)(4) of this section will not be considered. \* \* \*

(c) The Commission will dismiss an application for failure to prosecute or for failure to respond substantially within a specified time period to official correspondence or requests for additional information. Dismissal will be without prejudice unless the application is mutually exclusive pursuant to §25.155, in which case it will be dismissed with prejudice.

(d) An application will be dismissed without prejudice as a matter of right if the applicant requests its dismissal prior to final Commission action.

8. In § 25.113, revise paragraphs (f), (g), and (h) to read as follows and add paragraph (i):

§ 25.113 Station construction, deployment approval, and operation of spare satellites.

\* \* \* \* \*

(f) Construction permits are not required for U.S.-licensed space stations, except for stations that the applicant proposes to operate to disseminate program content to be received by the public at large, rather than only by subscribers. Construction of a station for which a construction permit is not required may commence, at the applicant's own risk, prior to grant of a license.

(g) Except as set forth in paragraphs (h) and (i) of this section, approval for orbital deployment and a station license (*i.e.*, operating authority) must be applied for and granted before a space station may be deployed and operated in orbit. Approval for orbital deployment may be requested in an application for a space station license. However, an application for authority to deploy and operate an on-ground spare satellite will be considered pursuant to the following procedures:

- (1) Applications for deployment and operation of an on-ground spare NGSO-like satellite will be considered pursuant to the procedures set forth in §25.157, except as provided in paragraph (g)(3) of this section.
- (2) Applications for deployment and operation of an on-ground spare GSO-like satellite will be considered pursuant to the procedures set forth in §25.158, except as provided in paragraph (g)(3) of this section.
- (3) Neither paragraph (g)(1) nor (g)(2) of this section will apply in cases where the space station to be deployed is determined to be an emergency replacement for a previously authorized space station that has been lost as a result of a launch failure or a catastrophic in-orbit failure.
- (h) An operator of NGSO space stations under a blanket license granted by the Commission need not apply for license modification to operate technically identical in-orbit spare satellites in an authorized orbit. However, the licensee must notify the Commission within 30 days of bringing an in-orbit spare into service and certify that its activation has not exceeded the number of space stations authorized to provide service and that the licensee has determined by measurement that the activated spare is operating within the terms of the license.
- (i) An operator of NGSO space stations under a blanket license granted by the Commission need not apply for license modification to deploy and operate technically identical replacement satellites in an authorized orbit within the term of the system authorization. However, the licensee must notify the Commission of the intended launch at least 30 days in advance and certify that its operation of the additional space station(s) will not increase the number of space stations providing service above the maximum number specified in the license.

9. In § 25.114, revise paragraphs (a), (b), (c)(4)(vi)(D), (c)(13), (d)(10), and (d)(15)(i), (iii), and (iv) to read as follows:

§ 25.114 Applications for space station authorizations.

- (a) (1) A license application filed pursuant to §25.110(b)(2) for a GSO space station or NGSO space station or space-station constellation must comprise a comprehensive proposal and must be submitted on FCC Form 312, Main Form and Schedule S, with attached exhibits required by paragraph (d) of this section.
- (2) An application for blanket authority for an NGSO constellation of space stations that are not all technically identical must provide the information required by paragraphs (c) and (d) of this section for each type of station in the constellation.
- (3) For an application filed pursuant to the two-step procedure in §25.110(b)(3), the filing pursuant to §25.110(b)(3)(iii) must be submitted on FCC Form 312, Main Form and Schedule S, with attached exhibits as required by paragraph (d) of this section, and must constitute a comprehensive proposal.
- (b) Each application for a new or modified space station authorization must contain the formal waiver required by 47 U.S.C. 304.
- (c) \* \* \*
- (4) \* \* \*
- (vi) \* \* \*
- (D) For a space station with steerable beams that are not shapeable, specify the applicable contours, as defined in paragraph(c)(4)(vi)(A) or (B) of this section, with a description of a proposed coverage area for each steerable beam or provide the contour information described in paragraph (c)(4)(vi)(C) of this section for each steerable beam.

\* \* \* \* \*

(13) And the polarization information necessary to determine compliance with §25.210(i).

(d) \* \* \*

(10) An application for space station authorization in the 1.6/2.4 GHz or 2 GHz Mobile-Satellite Service must include information required by §25.143(b);

\* \* \* \* \*

(15) \* \* \*

(i) If the applicant proposes to operate in the 17.3-17.7 GHz frequency band, a demonstration that the proposed space station will comply with the power flux density limits in §25.208(w) unless the applicant provides a certification under paragraph (d)(15)(ii) of this section.

\* \* \* \* \*

(iii) If the applicant proposes to provide international service in the 17.7-17.8 GHz frequency band, a certification that the proposed space station will comply with the power flux density limits in §25.208(c).

(iv) Any information required by §§25.264(a)(6), 25.264(b)(4), or 25.264(d).

\* \* \* \* \*

10. In § 25.115, revise paragraph (a)(2) introductory text and paragraphs (a)(2)(iii)-(vii) to read as follows; remove paragraphs (a)(2)(viii) and (ix); revise paragraphs (c)(1) and (c)(2) to read as follows; add paragraph (c)(3) to read as follows; remove the word “CSAT” and “CSATs” wherever they appear in paragraph (c); revise paragraph (e), the second sentence in paragraph (f), paragraph (g) introductory text, and paragraphs (g)(1) and (2) to read as follows; and remove and reserve paragraph (h), revise paragraph (i), and paragraphs (k)(1) and (k)(2) to read as follows:

§ 25.115 Applications for earth station authorizations.

(a) \* \* \*

(2) Applicants for licenses for transmitting earth stations in the FSS may file on FCC Form 312EZ if all of the following criteria are met:

\* \* \* \* \*

(iii) The application meets all relevant criteria in §§25.211 or 25.212 or includes information filed pursuant to paragraph (g)(1) of this section indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant levels specified in §§25.138(a) or 25.218; and

(iv) Operation of the proposed station has been successfully coordinated with terrestrial systems, if the station would transmit in the 5925-6425 MHz band; and

(v) The application includes an environmental impact statement pursuant to §1.1311 of this chapter, if required; and

(vi) The applicant does not propose to communicate via non-U.S.-licensed space stations not on the Permitted Space Station List; and

(vii) If the proposed station(s) will receive in the 18.3-18.8 GHz and/or 19.7-20.2 GHz bands, the applicant proposes to communicate only via satellites for which coordination has been completed pursuant to Footnote US334 of the U.S. Table of Frequency Allocations with respect to Federal Government systems authorized on a primary basis, under an agreement previously approved by the Commission and the National Telecommunications and Information Administration, and the applicant certifies that it will operate consistently with the agreement.

\* \* \* \* \*



(c)(1) Networks of earth stations operating in the 11.7-12.2 GHz and 14.0-14.5 GHz bands with U.S.-licensed or non-U.S.-licensed space stations for domestic or international services. Applications to license networks of earth stations operating in any portion of the 11.7-12.2 GHz and 14.0-14.5 GHz bands under blanket operating authority may be filed on FCC Form 312 or Form 312EZ, with a Schedule B for each large (5 meters or larger) hub station antenna and each representative type of small antenna (less than 5 meters) operating within the network.

(i) Applications to license networks of earth stations operating in the 11.7-12.2 GHz and 14.0-14.5 GHz bands under blanket operating authority that meet the requirements of §§25.212(c) or 25.218(e) or (f) will be routinely processed.

(ii) Applications to license networks of earth stations operating in the 11.7-12.2 GHz and 14.0-14.5 GHz bands under blanket operating authority that do not meet the requirements of §§25.212(c) or 25.218(e) or (f) must comply with the requirements in §25.220 and must be filed on FCC Form 312 with a Schedule B for each large (5 meters or larger) hub station antenna and each representative type of small antenna (less than 5 meters) operating within the network.

(c)(2) Networks of earth stations operating in the 3700-4200 MHz and 5925-6425 MHz bands. Applications to license networks of earth stations operating in the 3700-4200 MHz and 5925-6425 MHz bands must be filed electronically on FCC Form 312, Main Form and Schedule B. Applications will be routinely processed provided that frequency coordination has been satisfactorily completed and that the proposed earth stations comply with the applicable provisions in §§25.211(d) or 25.212(d). Alternatively, applicants that have satisfactorily completed frequency coordination may be routinely processed if the proposed earth stations comply with the applicable off-axis EIRP density limits in §25.218(c) or (d).

(i) For earth station antennas operating with power levels not consistent with the applicable provisions in §§25.211(d) or 25.212(d), or with EIRP density levels not consistent with those specified in §25.218(c) or (d), the applicant must file an initial lead application providing a detailed overview of the complete network. Such lead applications must fully identify the scope and nature of the service to be provided, as well as the complete technical details of each representative type of antenna that will operate within the network. Such lead applications for a single system must identify:

\* \* \* \* \*

(c)(3) Networks of earth stations operating in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30 GHz bands with U.S.-licensed or non-U.S.-licensed satellites for domestic or international services.

(i) Applications to license networks of earth stations that will transmit digitally modulated signals to GSO space stations in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands under blanket operating authority must be filed on FCC Form 312, or Form 312EZ if available, with a Schedule B for each large (5 meters or larger) hub station antenna and each representative type of small antenna (less than 5 meters) operating within the network and may be routinely processed if the criteria in the following paragraphs (A) or (B) are met:

(A) The applicant certifies pursuant to §25.132(a)(1) that the off-axis gain of transmitting antennas in the network will not exceed the relevant levels specified in §25.209(a) and (b) and the power spectral density of any digitally modulated carrier into any transmitting earth station antenna in the proposed network will not exceed 3.5 dBW/MHz as specified in §25.212(e).

(B) The application includes information filed pursuant to paragraph (g)(1) of this section indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in §25.138(a).

(ii) Applications to license networks of earth stations operating in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands under blanket operating authority that do not meet the requirements of §§25.212(e) or 25.138(a) must comply with the requirements in §25.220 and must be filed on FCC Form 312 with a

Schedule B for each large (5 meters or larger) hub station antenna and each representative type of small antenna (less than 5 meters) operating within the network.

\* \* \* \* \*

(e) License applications for earth station operation in any portion of the 18.3-20.2 GHz and 28.35-30.0 GHz bands not filed on FCC Form 312EZ pursuant to paragraph (a)(2) of this section must be filed on FCC Form 312, Main Form and Schedule B, and must include any information required by paragraph (g) or (j) of this section or by §25.130. An applicant may request authority for operation of GSO FSS earth stations in the conventional Ka-band, or for operation of NGSO FSS earth stations in the 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 (Earth-to-space) bands, without specifying the location of user terminals but must specify the geographic area(s) in which they will operate and the location of hub and/or gateway stations.

(f) \* \* \* Applications for blanket authority to operate transceiver units may be filed using FCC Form 312, Main Form and Schedule B.

\* \* \* \* \*

(g) Applications for earth stations that will transmit to GSO space stations in any portion of the 5850-6725 MHz, 13.75-14.5 GHz, 24.75-25.25 GHz, 28.35-28.6 GHz, or 29.25-30.0 GHz bands must include, in addition to the particulars of operation identified on FCC Form 312 and associated Schedule B, the information specified in either paragraph (g)(1) or (g)(2) of this section for each earth station antenna type.

(1) Specification of off-axis EIRP density calculated from measurements made consistent with the requirements in §25.132(b)(1), in accordance with the following requirements. For purposes of this rule, the “off-axis angle” is the angle in degrees from a line between an earth station antenna and the target satellite.

(i) A plot of maximum co-polarized EIRP density in the plane tangent to the GSO arc at off-axis angles from minus 180° to plus 180°;

(ii) A plot of maximum co-polarized EIRP density in the plane tangent to the GSO arc at off-axis angles from minus 10° to plus 10°;

(iii) A plot of maximum co-polarized EIRP density in the plane perpendicular to the GSO arc at off-axis angles from 0° to plus 30°;

(iv) A plot of maximum cross-polarized EIRP density in the plane tangent to the GSO arc at off-axis angles from minus 7° to plus 7°;

(v) A plot of maximum cross-polarized EIRP density in the plane perpendicular to the GSO arc at off-axis angles from minus 7° to plus 7°;

(vi) For antennas for which gain measurements are made pursuant to §25.132(b)(1)(iv), the EIRP density plots specified in paragraphs (g)(1)(i)-(v) of this section must be provided over the specified angular ranges in two orthogonal planes, one of which is tangent to the GSO arc and with the antenna operating at its maximum skew angle, which the applicant must specify.

(vii) The relevant off-axis EIRP density envelopes in §§25.138, 25.218, 25.221, 25.222, 25.223, 25.226, or 25.227 must be superimposed on plots submitted pursuant to paragraphs (g)(1)(i)-(vi) of this section.

(viii) The showing must include a supplemental table for each off-axis angular range in which the relevant EIRP density envelope will be exceeded, specifying angular coordinates in degrees off-axis and corresponding calculated off-axis EIRP density at 0.2° increments over the angular range in which the routine envelope will be exceeded and one degree on each side of that range.

(2) An applicant that certifies pursuant to §25.132(a)(1) that a proposed antenna’s measured gain pattern conforms to relevant standards in §25.209(a) and (b) and that input power density to the antenna will not

exceed the relevant limit in §§25.211 or 25.212 need not provide a showing pursuant to paragraph (g)(1) of this section for operation with that antenna.

\* \* \* \* \*

(i) An earth station applicant filing an application for a blanket-licensed earth station network made up of FSS earth stations and planning to use a contention protocol must include in its application a certification that its contention protocol usage will be reasonable.

\* \* \* \* \*

(k)(1) Applicants for FSS earth stations that qualify for routine processing in the conventional or extended C-bands, the conventional or extended Ku-bands, the conventional Ka-band, or the 24.75-25.25 GHz band, including ESV applications filed pursuant to §25.222(a)(1) or (a)(3), VMES applications filed pursuant to §25.226(a)(1) or (a)(3), and ESAA applications filed pursuant to §25.227(a)(1) or (a)(3), may designate the Permitted Space Station List as a point of communication. Once such an application is granted, the earth station operator may communicate with any space station on the Permitted Space Station List, provided that the operation is consistent with the technical parameters and conditions in the earth station license and any limitations placed on the space station authorization or noted in the Permitted Space Station List.

(2) Notwithstanding paragraph (k)(1) of this section, the operator of an earth station that qualifies for routine processing in the conventional Ka-band may not communicate with a space station on the Permitted Space Station List in the 18.3-18.8 GHz or 19.7-20.2 GHz band until the space station operator has completed coordination under Footnote US334 to §2.106 of this chapter.

\* \* \* \* \*

11. In § 25.117, add paragraph (h) to read as follows:

§ 25.117 Modification of station license.

\* \* \* \* \*

(h) Unless otherwise ordered by the Commission, an application for any of the following kinds of modification of the operation of a GSO space station will be deemed granted 35 days after the date of the public notice that the application has been accepted for filing, provided no objection is filed during the 30-day notice period and the application does not propose a change that would be inconsistent with a Commission rule or require modification of the BSS plan in Appendix 30 or the associated feeder-link Plan in Appendix 30A of the ITU's Radio Regulations.

(1) Relocation of a DBS or GSO FSS space station by no more than 0.15° from the initially authorized orbital location, provided the application includes a signed certification that:

(i) the space station operator has assessed and limited the probability of the satellite becoming a source of debris as a result of collisions with large debris or other operational satellites at the new orbital location; and

(ii) the proposed station-keeping volume of the satellite following relocation will not overlap a station-keeping volume reasonably expected to be occupied by any other satellite, including those authorized by the Commission, applied for and pending before the Commission, or otherwise the subject of an ITU filing and either in orbit or progressing towards launch.

(2) Repositioning one or more antenna beams by no more than 0.3 angular degrees from a line between the space station and the initially authorized boresight location(s).

12. In § 25.118, revise paragraphs (a), (b), and (e) to read as follows:

§ 25.118 Modifications not requiring prior authorization.

(a) Earth station modifications, notification required. Earth station licensees may make the following modifications without prior Commission authorization, provided they notify the Commission, using FCC Form 312 and Schedule B, within 30 days of the modification. The notification must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of part 1, subpart Y of this chapter.

(1) Blanket-licensed earth station operators may add remote terminals operating on a primary basis without prior authorization, provided they have complied with all applicable frequency coordination procedures in accordance with §25.251.

(2) A licensee providing service on a private carrier basis may change its operations to common carrier status without obtaining prior Commission authorization. The licensee must notify the Commission using FCC Form 312 within 30 days after the completed change to common carrier status.

(3) An earth station operator may change a point of communication without prior authorization, provided the operator does not re-point the earth station's antenna beyond any coordinated range and (i) the change results from a space station relocation described in paragraph (e) of this section, or (ii) the new point of communication is a replacement GSO space station within  $\pm 0.15^\circ$  of orbital longitude of the same location, with authority to serve the U.S., and the change does not entail any increase in the earth station's EIRP or EIRP density.

(4) Licensees may make other changes to their authorized earth stations without prior authority from the Commission, provided the modification does not involve:

(i) An increase in EIRP or EIRP density (either main lobe or off-axis);

(ii) Additional operating frequencies;

(iii) A change in polarization;

(iv) An increase in antenna height;

(v) Antenna re-pointing beyond any coordinated range or

(vi) A change from the originally authorized coordinates of more than 1 second in latitude or longitude for stations operating in frequency bands shared with terrestrial systems or more than 10 seconds of latitude or longitude for stations operating in frequency bands not shared with terrestrial systems.

(b) Earth station modifications, notification not required. Notwithstanding paragraph (a) of this section, equipment in an authorized earth station may be replaced without prior authorization and without notifying the Commission if the new equipment is electrically identical to the existing equipment.

\* \* \* \* \*

(e) Relocation of GSO space stations. A space station licensee may relocate a GSO space station without prior authorization, but upon 30 days prior notice to the Commission and any potentially affected licensed spectrum user, provided that the operator meets the following requirements. The notification must be filed electronically on FCC Form 312 through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of part 1, subpart Y of this chapter:

(1) The space station will be relocated to a position within  $\pm 0.15^\circ$  of an orbital location assigned to the same licensee.

(2) The licensee certifies that the space station will operate after the relocation within the technical parameters authorized and coordinated for the space station previously assigned to that location.

(3) The licensee certifies that it will comply with all the conditions of its license for operation at the changed location.

- (4) The licensee certifies that it will limit operations of the space station to tracking, telemetry, and command functions during the relocation and satellite drift transition period.
- (5) The licensee certifies that:
- (i) it has assessed and limited the probability of the satellite becoming a source of debris as a result of collisions with large debris or other operational satellites at the new orbital location; and
  - (ii) the proposed station-keeping volume of the satellite following relocation will not overlap a station-keeping volume reasonably expected to be occupied by any other satellite, including those authorized by the Commission, applied for and pending before the Commission, or otherwise the subject of an ITU filing and either in orbit or progressing towards launch.
- (6) The licensee certifies that the relocation will not result in a lapse of service for any current customer.
- (7) If the space station to be relocated is a DBS space station, the licensee certifies that there will be no increase in interference due to the operations of the relocated space station that would require the Commission to submit a proposed modification to the ITU Appendix 30 Broadcasting-Satellite Service Plan and/or the Appendix 30A feeder-link Plan to the ITU Radiocommunication Bureau. A DBS licensee that meets this certification requirement is not subject to the requirements in paragraph (e)(2) of this section.
- (8) If the space station to be relocated is a DBS space station, the licensee certifies that it will meet the geographic service requirements in §25.148(c) after the relocation.

13. In § 25.119, revise paragraph (a) and add paragraphs (h), (i), and (j) to read as follows:

§ 25.119 Assignment or transfer of control of station authorization.

(a) You must file an application for Commission authorization before you can transfer, assign, dispose of (voluntarily or involuntarily, directly or indirectly, or by transfer of control of any corporation or any other entity) your construction permit or station license, or accompanying rights, except as provided in paragraph (h) of this section. The Commission will grant your application only if it finds that doing so will serve the public interest, convenience, and necessity.

\* \* \* \* \*

(h) Pro forma transactions involving a telecommunications carrier. You do not need prior Commission approval for a non-substantial (pro forma) transfer of control or assignment of license involving a telecommunications carrier, as defined in 47 U.S.C. 153(51). However, the pro forma transferee or assignee must file a notification with the Commission no later than 30 days after the transfer or assignment is completed. The notification must be filed on FCC Form 312, Main Form and Schedule A and must contain a certification that the transfer of control or assignment was pro forma and that, together with all previous pro forma transactions, it did not result in a change in the actual controlling party.

(i) Pro forma transactions not involving a telecommunications carrier. A complete application for Commission approval of a non-substantial (pro forma) transfer of control or assignment of license not involving a telecommunications carrier, as defined in 47 U.S.C. 153(51), will be deemed granted one business day after filing, provided that:

(1) approval does not require a waiver of, or a declaratory ruling pertaining to, any applicable Commission rule; and

(2) the application includes a certification that the proposed transfer of control or assignment is pro forma and that, together with all previous pro forma transactions, it would not result in a change in the actual controlling party.

(j) Receive-only earth station registrations. You do not need prior Commission approval for a transfer of control or assignment of a receive-only earth station registration. For all such transactions other than non-



substantial (pro forma) transfers of control, the transferee or assignee must file a notification with the Commission on FCC Form 312, Main Form and Schedule A no later than 30 days after the transfer or assignment is completed. No notification is required for a pro forma transfer of control of a receive-only earth station registrant.

14. In § 25.129, revise paragraph (c) to read as follows:

§ 25.129 Equipment authorization for portable earth-station transceivers.

\* \* \* \* \*

(c) In addition to the information required by §§1.1307(b) and 2.1033(c) of this chapter, applicants for certification required by this section must submit any additional equipment test data necessary to demonstrate compliance with pertinent standards for transmitter performance prescribed in §§25.138, 25.202(f), and 25.216, must submit the statements required by §2.1093(c) of this chapter, and must demonstrate compliance with the labeling requirement in §25.285(b).

15. In § 25.130, revise paragraph (b), paragraph (g) introductory text, and the note to paragraph (g) to read as follows:

§ 25.130 Filing requirements for transmitting earth stations.

\* \* \* \* \*

(b) A frequency coordination analysis in accordance with §25.203(b) must be provided for earth stations transmitting in the frequency bands shared with equal rights between terrestrial and space services, except applications for user transceiver units associated with the NVNG MSS, which must instead provide the information required by §25.135, and applications for 1.6/2.4 GHz MSS user transceivers, which must demonstrate that the transceivers will operate in compliance with relevant requirements in §25.213. Also, applications for transmitting earth stations must include any notification or demonstration required by any other relevant provision in §25.203.

\* \* \* \* \*

(g) Parties may apply, either in an initial application or an application for modification of license, for operating authority for multiple transmitting FSS earth stations that are not eligible for blanket or network licensing under another section of this part in the following circumstances:

\* \* \* \* \*

NOTE TO PARAGRAPH (g): This paragraph does not apply to applications for blanket-licensed earth station networks filed pursuant to §§25.115(c) or 25.218; applications for conventional Ka-band hub stations filed pursuant to §25.115(e); applications for NGSO FSS gateway earth stations filed pursuant to §25.115(f); applications filed pursuant to §§25.221, 25.222, 25.226, or 25.227; or applications for 29 GHz NGSO MSS feeder-link stations in a complex as defined in §25.257.

16. In § 25.131, revise paragraphs (b) and (j)(2) to read as follows:

§ 25.131 Filing requirements and registration for receive-only earth stations.

\* \* \* \* \*

(b) Receive-only earth stations in the FSS that operate with U.S.-licensed space stations, or with non-U.S.-licensed space stations that have been duly approved for U.S. market access, may be registered with the Commission in order to protect them from interference from terrestrial microwave stations in bands shared co-equally with the Fixed Service in accordance with the procedures of §§25.203 and 25.251, subject to the stricture in §25.209(c).

\* \* \* \* \*

(j) \* \* \*

(2) Operators of receive-only earth stations need not apply for a license to receive transmissions from non-U.S.-licensed space stations that have been duly approved for U.S. market access, provided the space station operator and earth station operator comply with all applicable rules in this chapter and with applicable conditions in the Permitted Space Station List or market-access grant.

17. In § 25.132, revise the section heading and paragraphs (a) and (b) to read as follows:

§ 25.132 Verification of earth station antenna performance.

(a)(1) Except as provided in paragraph (a)(2) of this section, applications for transmitting earth stations in the FSS, including feeder-link stations, must include a certification that the applicant has reviewed the results of a series of radiation pattern tests performed by the antenna manufacturer on representative equipment in representative configurations, and the test results demonstrate that the equipment meets relevant off-axis gain standards in §25.209, measured in accordance with paragraph (b)(1) of this section. Applicants and licensees must be prepared to submit the radiation pattern measurements to the Commission on request.

(2) Applicants that specify off-axis EIRP density pursuant to §25.115(g)(1) are exempt from the certification requirement in paragraph (a)(1) of this section.

(b)(1) For purposes of paragraph (a)(1) of this section and §25.115(g)(1), the following measurements on a production antenna performed on calibrated antenna range must be made at the top and bottom of each frequency band assigned for uplink transmission:

(i) (A) Co-polarized gain in the azimuth plane must be measured across a range extending to 180° on each side of the main-lobe axis, and the measurements must be represented in two plots: one across the entire angular range of  $\pm 180^\circ$  from the main-lobe axis and the other across  $\pm 10^\circ$  from the main-lobe axis.

(B) Co-polarized gain must be measured from 0° to 30° from beam peak in the elevation plane.

(ii) Cross-polarization gain must be measured across a range of plus and minus 7° from beam peak in the azimuth and elevation planes.

(iii) Main beam gain.

(iv) For antennas with asymmetric apertures or beams, where the minor axis of the antenna beam (major axis of the antenna aperture) will not always be aligned parallel to the plane tangent to the GSO arc, the measurements in paragraphs (b)(1)(i)-(iii) of this section must be made over the angular ranges specified in paragraphs (b)(1)(i)(A) and (B) of this section in two orthogonal planes, with the antenna oriented at the maximum skew angle at which it will operate.

(2) The relevant envelope specified in §25.209 must be superimposed on each measured pattern.

18. In § 25.133, revise paragraphs (a)(2), (b)(1)(v) and (vi), and (b)(2) to read as follows and remove and reserve paragraph (c):

§ 25.133 Period of construction; certification of commencement of operation.

(a) \* \* \*

(2) Operation of a network of earth stations at unspecified locations under an initial blanket license must commence within 12 months from the date of the license grant unless the Commission orders otherwise.

(b) (1) \* \* \*

(v) A certification that the facility as authorized has been completed and that each antenna has been tested and found to perform within authorized gain patterns or off-axis EIRP density levels; and

(vi) The date when the earth station became operational.

(2) For FSS earth stations authorized under a blanket license, the licensee must notify the Commission when the earth station network commences operation. The notification should include the information described in paragraphs (b)(1)(i)-(iv) of this section and a certification that each hub antenna, and a type of antenna used in remote stations in the network, has been tested and found to perform within authorized gain patterns or off-axis EIRP density levels. For any type of antenna whose performance was not certified when the network commenced operation, the licensee must submit the information and certification stated above for the antenna type when it is first deployed.

\* \* \* \* \*

19. Remove and reserve § 25.134.

§ 25.134 [Reserved]

20. In § 25.137, revise the section heading, paragraph (a) introductory text, paragraph (d) introductory text, and paragraphs (d)(4), (d)(5), (e), and (f) to read as follows:

§ 25.137 Requests for U.S. market access through non-U.S.-licensed space stations.

(a) Earth station applicants requesting authority to communicate with a non-U.S.-licensed space station and entities filing a petition for declaratory ruling to access the United States market using a non-U.S.-licensed space station must attach an exhibit with their FCC Form 312 demonstrating that U.S.-licensed satellite systems have effective competitive opportunities to provide analogous services in:

\* \* \* \* \*

(d) Earth station applicants requesting authority to communicate with a non-U.S.-licensed space station and entities filing a petition for declaratory ruling to access the United States market must demonstrate that the non-U.S.-licensed space station has complied with all applicable Commission requirements for non-U.S.-licensed systems to operate in the United States, including but not limited to the following:

\* \* \* \* \*

(4) The surety bond requirement in §25.165, for non-U.S.-licensed space stations that are not in orbit and operating.

(5) Recipients of U.S. market access for NGSO-like satellite operation that have one market access request on file with the Commission in a particular frequency band, or one granted market access request for an unbuilt NGSO-like system in a particular frequency band, will not be permitted to request access to the U.S. market through another NGSO-like system in that frequency band.

(e) An entity requesting access to the United States market through a non-U.S.-licensed space station pursuant to a petition for declaratory ruling may amend its request by submitting an additional petition for declaratory ruling. Such additional petitions will be treated on the same basis as amendments filed by U.S. space station applicants for purposes of determining the order in which the petitions will be considered relative to pending applications and petitions.

(f) A non-U.S.-licensed space station operator that has been granted access to the United States market pursuant to a declaratory ruling may modify its U.S. operations under the procedures set forth in §§25.117(d) and (h) and 25.118(e).

\* \* \* \* \*

21. In § 25.138, revise the section heading, paragraph (a) introductory text, and paragraphs (a)(1)-(5) and (b) to read as follows; remove and reserve paragraphs (c), (d), and (e); and remove paragraph (g):

§ 25.138 Licensing requirements for GSO FSS earth stations in the conventional Ka-band.

(a) Applications for earth station licenses in the GSO FSS in the conventional Ka-band that indicate that the following requirements will be met and include the information required by relevant provisions in §§25.115 and 25.130 may be routinely processed:

(1) The EIRP density of co-polarized signals in the plane tangent to the GSO arc, as defined in §25.103, will not exceed the following values under clear sky conditions:

32.5 - 25log( $\theta$ )	dBW/MHz	for	$2.0^\circ \leq \theta \leq 7^\circ$
11.5	dBW/MHz	for	$7^\circ \leq \theta \leq 9.2^\circ$
35.5 - 25log( $\theta$ )	dBW/MHz	for	$9.2^\circ \leq \theta \leq 19.1^\circ$
3.5	dBW/MHz	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite.

(2) In the plane perpendicular to the GSO arc, as defined in §25.103, the EIRP density of co-polarized signals will not exceed the following values under clear sky conditions:

35.5 - 25log( $\theta$ )	dBW/MHz	for	$3.5^\circ \leq \theta \leq 7^\circ$
14.4	dBW/MHz	for	$7^\circ < \theta \leq 9.2^\circ$
38.5 - 25log( $\theta$ )	dBW/MHz	for	$9.2^\circ < \theta \leq 19.1^\circ$
6.5	dBW/MHz	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (a)(1) of this section.

(3) The EIRP density levels specified in paragraphs (a)(1) and (2) of this section may be exceeded by up to 3 dB, for values of  $\theta > 7^\circ$ , over 10% of the range of theta ( $\theta$ ) angles from 7-180° on each side of the line from the earth station to the target satellite.

(4) The EIRP density of cross-polarized signals will not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc under clear sky conditions:

22.5 - 25log( $\theta$ )	dBW/MHz	for	$2.0^\circ < \theta \leq 7.0^\circ$
--------------------------	---------	-----	-------------------------------------

where  $\theta$  is as defined in paragraph (a)(1) of this section.

(5) A license application for earth station operation in a network using variable power density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (a)(1)-(a)(4) of this section.

\* \* \* \* \*

(b) Operation with off-axis EIRP density exceeding a relevant envelope specified in paragraph (a) of this section and applications proposing such operation are subject to coordination requirements in §25.220.

\* \* \* \* \*

22. In § 25.140, revise paragraphs (a), (b)(3), and (d) to read as follows:

§ 25.140 Further requirements for license applications for GSO space station operation in the FSS and the 17/24 GHz BSS.

(a) (1) In addition to the information required by §25.114, an applicant for GSO FSS space station operation involving transmission of analog video signals must certify that the proposed analog video operation has been coordinated with operators of authorized co-frequency space stations within six degrees of the requested orbital location.

(2) In addition to the information required by §25.114, an applicant for GSO FSS space station operation at an orbital location less than two degrees from the assigned location of an authorized co-frequency GSO space station must either certify that the proposed operation has been coordinated with the operator of the co-frequency space station or submit an interference analysis demonstrating the compatibility of the proposed system with the co-frequency space station. Such an analysis must include, for each type of radio frequency carrier, the link noise budget, modulation parameters, and overall link performance analysis. (See Appendices B and C to Licensing of Space Stations in the Domestic Fixed-Satellite Service, FCC 83-184, and the following public notices, copies of which are available in the Commission's EDOCS database: DA 03-3863 and DA 04-1708.) The provisions in this paragraph do not apply to proposed analog video operation, which is subject to the requirement in paragraph (a)(1) of this section.

(3) In addition to the information required by §25.114, an applicant for a GSO FSS space station must provide the following for operation other than analog video operation:

(i) With respect to proposed operation in the conventional or extended C-bands, a certification that downlink EIRP density will not exceed 3 dBW/4kHz for digital transmissions or 8 dBW/4kHz for analog transmissions and that associated uplink operation will not exceed applicable EIRP density envelopes in §§25.218 or 25.221(a)(1) unless the non-routine uplink and/or downlink operation is coordinated with operators of authorized co-frequency space stations at assigned locations within six degrees of the orbital location of the proposed space station and except as provided in paragraph (d) of this section.

(ii) With respect to proposed operation in the conventional or extended Ku-bands, a certification that downlink EIRP density will not exceed 14 dBW/4kHz for digital transmissions or 17 dBW/4kHz for analog transmissions and that associated uplink operation will not exceed applicable EIRP density envelopes in §§25.218, 25.222(a)(1), 25.226(a)(1), or 25.227(a)(1) unless the non-routine uplink and/or downlink operation is coordinated with operators of authorized co-frequency space stations at assigned locations within six degrees of the orbital location of the proposed space station and except as provided in paragraph (d) of this section.

(iii) With respect to proposed operation in the conventional Ka-band, a certification that the proposed space station will not generate power flux-density at the Earth's surface in excess of -118 dBW/m<sup>2</sup>/MHz and that associated uplink operation will not exceed applicable EIRP density envelopes in §25.138(a) unless the non-routine uplink and/or downlink operation is coordinated with operators of authorized co-frequency space stations at assigned locations within six degrees of the orbital location and except as provided in paragraph (d) of this section.

(iv) With respect to proposed operation in the 4500-4800 MHz (space-to-Earth), 6725-7025 MHz (Earth-to-space), 10.70-10.95 GHz (space-to-Earth), 11.20-11.45 GHz (space-to-Earth), and/or 12.75-13.25 GHz (Earth-to-space) bands, a statement that the proposed operation will take into account the



applicable requirements of Appendix 30B of the ITU's Radio Regulations and a demonstration that it is compatible with other U.S. ITU filings under Appendix 30B.

(v) With respect to proposed operation in other FSS bands, an interference analysis demonstrating compatibility with any previously authorized co-frequency space station at a location two degrees away or a certification that the proposed operation has been coordinated with the operator(s) of the previously authorized space station(s). If there is no previously authorized space station at a location two degrees away, the applicant must submit an interference analysis demonstrating compatibility with a hypothetical co-frequency space station two degrees away with the same receiving and transmitting characteristics as the proposed space station.

(b) \* \* \*

(3) Except as described in paragraph (b)(5) of this section, an applicant for a license to operate a 17/24 GHz BSS space station that will be located precisely at one of the 17/24 GHz BSS orbital locations specified in Appendix F of the Report and Order adopted May 2, 2007, IB Docket No. 06-123, FCC 07-76, must certify that the downlink power flux density on the Earth's surface will not exceed the values specified in §25.208(w), and that the associated feeder-link earth station transmissions will not exceed the EIRP density limits in §25.223(c) unless the non-conforming uplink operation is coordinated with other affected 17/24 GHz BSS systems in accordance with §25.223(c).

\* \* \* \* \*

(d) An operator of a GSO FSS space station in the conventional or extended C-bands, conventional or extended Ku-bands, or conventional Ka-band may notify the Commission of its non-routine transmission levels and be relieved of the obligation to coordinate such levels with later applicants and petitioners.

(1) The letter notification must include the downlink off-axis EIRP density levels or power flux density levels and/or uplink off-axis EIRP density levels, specified per frequency range and space station antenna beam, that exceed the relevant routine limits set forth in paragraphs (a)(3)(i)-(iii) of this section and §§25.138(a), 25.218, 25.221(a)(1), 25.222(a)(1), 25.226(a)(1), or 25.227(a)(1).

(2) The notification will be placed on public notice pursuant to §25.151(a)(11).

(3) Non-routine transmissions notified pursuant to this paragraph (d) need not be coordinated with operators of authorized co-frequency space stations that filed their complete applications or petitions after the date of filing of the notification with the Commission. Such later applicants and petitioners must accept any additional interference caused by the notified non-routine transmissions.

(4) An operator of a replacement space station, as defined in §25.165(e), may operate with non-routine transmission levels to the extent permitted under paragraph (d)(3) of this section for the replaced space station.

23. In § 25.142, remove paragraph (a)(5).

§ 25.142 [Amended]

24. In § 25.143, revise paragraph (a) and the introductory text of paragraph (b)(2) to read as follows, remove paragraph (c), redesignate paragraph (f) as paragraph (c), and redesignate paragraph (h) as paragraph (d).

§ 25.143 Licensing provisions for the 1.6/2.4 GHz Mobile-Satellite Service and 2 GHz Mobile-Satellite Service.

(a) Authority to launch and operate a constellation of NGSO satellites will be granted in a single blanket license for operation of a specified number of space stations in specified orbital planes. An individual license will be issued for each GSO satellite, whether it is to be operated in a GSO-only system or in a

GSO/NGSO hybrid system.

(b) \* \* \*

(2) Technical qualifications. In addition to providing the information specified in paragraph (b)(1) of this section, each applicant and petitioner must demonstrate the following:

\* \* \* \* \*

25. In § 25.145, revise the section heading and paragraph (e) to read as follows, and remove paragraphs (f), (g), and (h).

§ 25.145 Licensing provisions for the FSS in the 18.3-20.2 GHz and 28.35-30.0 GHz bands.

\* \* \* \* \*

(e) Prohibition of certain agreements. No license shall be granted to any applicant for a space station in the FSS operating in portions of the 18.3-20.2 GHz and 28.35-30.0 GHz bands if that applicant, or any persons or companies controlling or controlled by the applicant, shall acquire or enjoy any right, for the purpose of handling traffic to or from the United States, its territories or possessions, to construct or operate space segment or earth stations, or to interchange traffic, which is denied to any other United States company by reason of any concession, contract, understanding, or working arrangement to which the Licensee or any persons or companies controlling or controlled by the Licensee are parties.

26. In § 25.146, revise the section heading, second sentence in paragraph (a)(1) and the heading of paragraph (a)(2) to read as follows and remove paragraph (m).

§ 25.146 Licensing and operating rules for the NGSO FSS in the 10.7 GHz-14.5 GHz bands.

(a) \* \* \*

(1) \* \* \* The PFD masks shall be generated in accordance with the specification stipulated in the most recent version of ITU-R Recommendation S.1503, "Functional description to be used in developing software tools for determining conformity of non-geostationary satellite orbit fixed-satellite system networks with limits contained in Article 22 of the Radio Regulations." \* \* \*

\* \* \* \* \*

(2) Single-entry additional operational equivalent power flux-density, in the Earth-to-space direction, (additional operational EPFD<sub>up</sub>) limits. \* \* \* \* \*

27. Remove and reserve § 25.147.

§ 25.147 [Reserved]

28. In § 25.151, revise the section heading and paragraphs (a)(1), (a)(7), and (a)(8) to read as follows and add paragraphs (a)(9)-(11).

§ 25.151 Public notice.

(a) \* \* \*

(1) The receipt of applications for new station authorizations, except applications for space station licenses filed pursuant to §25.110(b)(3)(i) or (ii) of this part;

\* \* \* \* \*

(7) Information that the Commission in its discretion believes to be of public significance;

- (8) Special environmental considerations as required by part 1 of this chapter; and
- (9) Submission of Coordination Requests and Appendix 30B filings to the ITU in response to requests filed pursuant to §25.110(b)(3)(i) and (ii).
- (10) The receipt of space station application information filed pursuant to §25.110(b)(3)(iii).
- (11) The receipt of notifications of non-routine transmission filed pursuant to §25.140(d).

\* \* \* \* \*

29. Remove and reserve § 25.152.

§ 25.152 [Reserved]

30. In § 25.155, delete the word “electrical” in paragraph (a) and revise paragraphs (b) and (c) to read as follows:

§ 25.155 Mutually exclusive applications.

\* \* \* \* \*

(b) A license application for NGSO-like satellite operation, as defined in §25.157(a), will be entitled to comparative consideration with one or more mutually exclusive applications only if the application is received by the Commission in a condition acceptable for filing by the “cut-off” date specified in a public notice.

(c) A license application for GSO-like satellite operation, as defined in §25.158(a)(1), will be entitled to comparative consideration with another application only if:

- (1) The application is mutually exclusive with another application for GSO-like operation; and
- (2) The application is received by the Commission in a condition acceptable for filing at the same millisecond as the other application.

31. In § 25.156, remove and reserve paragraph (b) and revise paragraphs (d)(1)-(5) to read as follows:

§ 25.156 Consideration of applications.

\* \* \* \* \*

(d)(1) Applications for NGSO-like satellite operation will be considered pursuant to the procedures set forth in §25.157, except as provided in §25.157(b).

(2) Applications for GSO-like satellite operation will be considered pursuant to the procedures set forth in §25.158, except as provided in §25.158(a)(2).

(3) Applications for both NGSO-like satellite operation and GSO-like satellite operation in two or more service bands will be treated as separate applications for each service band, and each service band request will be considered pursuant to §§25.157 or 25.158, as appropriate.

(4) Applications for feeder-link authority or inter-satellite link authority will be treated like an application separate from its associated service band. Each feeder-link request or inter-satellite link request will be considered pursuant to the procedure for applications for GSO-like operation or NGSO-like operation, as applicable.

(5) In cases where the Commission has not adopted frequency-band specific service rules, the Commission will not consider applications for NGSO-like satellite operation after it has granted an

application for GSO-like operation in the same frequency band, and it will not consider applications for GSO-like operation after it has granted an application for NGSO-like operation in the same band, unless and until the Commission establishes NGSO/GSO sharing criteria for that frequency band. In the event that the Commission receives applications for NGSO-like operation and applications for GSO-like operation at the same time, and the Commission has not adopted sharing criteria in that band, the Commission will divide the spectrum between GSO-like and NGSO-like licensees based on the proportion of qualified GSO-like and NGSO-like applicants.

\* \* \* \* \*

32. In § 25.157, revise the section heading, paragraphs (a), (b), (c) introductory text, (g)(1), and the last sentence in paragraph (g)(2) to read as follows:

§ 25.157 Consideration of applications for NGSO-like satellite operation.

(a) This section specifies the procedures for considering license applications for “NGSO-like” satellite operation, except as provided in paragraph (b) of this section. For purposes of this section, the term “NGSO-like satellite operation” means:

- (1) operation of any NGSO satellite system, and
- (2) operation of a GSO MSS satellite to communicate with earth stations with non-directional antennas.

(b) The procedures prescribed in this section do not apply to an application for authority to launch and operate a replacement space station, or stations, that meet the relevant criteria in §25.165(e)(1) and (2) and that will be launched before the space station(s) to be replaced are, or is, retired from service or within a reasonable time after loss of a space station during launch or due to premature failure in orbit.

(c) Each application for NGSO-like satellite operation that is acceptable for filing under §25.112, except replacement applications described in paragraph (b) of this section, will be reviewed to determine whether it is a “competing application,” *i.e.*, filed in response to a public notice initiating a processing round, or a “lead application,” *i.e.*, all other applications for NGSO-like satellite operation.

\* \* \* \* \*

(g)(1) In the event that a license granted in a processing round pursuant to this section is cancelled for any reason, the Commission will redistribute the bandwidth allocated to that applicant equally among the remaining applicants whose licenses were granted concurrently with the cancelled license, unless the Commission determines that such a redistribution would not result in a sufficient number of licensees remaining to make reasonably efficient use of the frequency band.

- (2) \* \* \* Parties already holding licenses for NGSO-like satellite operation in that frequency band will not be permitted to participate in that processing round.

\* \* \* \* \*

33. In § 25.158, revise the section heading, paragraphs (a), (b) introductory text, (b)(2), (c), and (d) introductory text to read as follows:

§ 25.158 Consideration of applications for GSO-like satellite operation.

(a)(1) This section specifies the procedures for considering license applications for “GSO-like” satellite operation, except as provided in paragraph (a)(2) of this section. For purposes of this section, the term “GSO-like satellite operation” means operation of a GSO satellite to communicate with earth stations with directional antennas, including operation of GSO satellites to provide MSS feeder links.

- (2) The procedures prescribed in this section do not apply to an application for authority to launch and operate a replacement space station that meets the relevant criteria in §25.165(e)(1) and (2) and that will

be launched before the space station to be replaced is retired from service or within a reasonable time after loss of a space station during launch or due to premature failure in orbit.

(b) Except as provided in paragraph (a)(2) of this section, license applications for GSO-like satellite operation, including first-step filings pursuant to §25.110(b)(3)(i) or (ii), will be placed in a queue and considered in the order that they are filed, pursuant to the following procedure:

\* \* \* \* \*

(2) If the application is acceptable for filing under §25.112, the application will be placed on public notice pursuant to §25.151.

(i) For applications filed pursuant to §25.110(b)(3)(i) or (ii), the public notice will announce that the Coordination Request or Appendix 30B filing has been submitted to the ITU. When further information is filed pursuant to §25.110(b)(3)(iii), it will be reviewed to determine whether it is substantially complete within the meaning of §25.112. If so, a second public notice will be issued pursuant to §25.151 to give interested parties an opportunity to file pleadings pursuant to §25.154.

(ii) For any other license application for GSO-like satellite operation, the public notice will announce that the application has been found acceptable for filing and will give interested parties an opportunity to file pleadings pursuant to §25.154.

(c) A license applicant for GSO-like satellite operation must not transfer, assign, or otherwise permit any other entity to assume its place in any queue.

(d) In the event that two or more applications for GSO-like satellite operation are mutually exclusive within the meaning of §25.155(c), the Commission will consider those applications pursuant to the following procedure:

\* \* \* \* \*

34. In § 25.159, remove and reserve paragraph (a).

§ 25.159 Limits on pending applications and unbuilt satellite systems.

(a) [Reserved]

35. In § 25.163, revise paragraph (a)(3) to read as follows:

§ 25.163 Reinstatement.

(a) \* \* \*

(3) The petition sets forth with specificity the procedures that have been established to ensure timely filings in the future.

\* \* \* \* \*

36. In § 25.164, revise paragraphs (a) and (b) to read as follows, remove and reserve paragraphs (c)-(e), and revise paragraphs (f) and (g) to read as follows:

§ 25.164 Milestones.

(a) The recipient of an initial license for a GSO space station, other than a DBS or SDARS space station, granted on or after August 27, 2003, must launch the space station, position it in its assigned orbital location, and operate it in accordance with the station authorization no later than five years after the grant of the license, unless a different schedule is established by Title 47, Chapter I, or the Commission.

(b) The recipient of an initial license for an NGSO satellite system, other than a DBS or SDARS satellite

system, granted on or after September 11, 2003, must launch the space stations, place them in the assigned orbits, and operate them in accordance with the station authorization no later than six years after the grant of the license, unless a different schedule is established by Title 47, Chapter I, or the Commission.

(c) [Reserved]

(d) [Reserved]

(e) [Reserved]

(f) A licensee subject to the requirements in paragraph (a) or (b) of this section must either demonstrate compliance with the applicable requirement or notify the Commission in writing that the requirement was not met, within 15 days after the specified deadline. Compliance with a milestone requirement in paragraph (a) or (b) of this section may be demonstrated by certifying pursuant to §25.121(d) that the space station(s) in question, has, or have, been launched and placed in the authorized orbital location or non-geostationary orbit(s) and that in-orbit operation of the space station or stations has been tested and found to be consistent with the terms of the authorization.

(g) Licensees of satellite systems that include both NGSO satellites and GSO satellites, other than DBS and SDARS satellite systems, must meet the requirement in paragraph (a) of this section with respect to the GSO satellite(s) and the requirement in paragraph (b) of this section with respect to the NGSO satellites.

\* \* \* \* \*

37. In §25.165, remove and reserve paragraph (d), revise the section heading, the first sentence in paragraph (a) introductory text, and paragraphs (a)(1)-(3), (c), and (e) to read as follows, and add paragraphs (f) and (g) to read as follows:

§ 25.165 Surety bonds.

(a) For all space station licenses issued after September 20, 2004, other than licenses for DBS space stations, SDARS space stations, and replacement space stations as defined in paragraph (e) of this section, the licensee must post a bond within 30 days of the grant of its license. \* \* \*

(1) An NGSO licensee must have on file a surety bond requiring payment in the event of default as defined in paragraph (c) of this section, in an amount, at a minimum, determined according to the following formula, with the resulting dollar amount rounded to the nearest \$10,000:  $A = \$1,000,000 + \$4,000,000 * D / 2192$ , where A is the amount to be paid and D is the lesser of 2192 or the number of days that elapsed from the date of license grant until the date when the license was surrendered.

(2) A GSO licensee must have on file a surety bond requiring payment in the event of default as defined in paragraph (c) of this section, in an amount, at a minimum, determined according to the following formula, with the resulting dollar amount rounded to the nearest \$10,000:  $A = \$1,000,000 + \$2,000,000 * D / 1827$ , where A is the amount to be paid and D is the lesser of 1827 or the number of days that elapsed from the date of license grant until the date when the license was surrendered.

(3) Licensees of satellite systems including both NGSO space stations and GSO space stations that will operate in the same frequency bands must file a surety bond requiring payment in the event of default as defined in paragraph (c) of this section, in an amount, at a minimum, to be determined according to the formula in paragraph (a)(1) of this section.

\* \* \* \* \*

(c) A licensee will be considered to be in default with respect to a bond filed pursuant to paragraph (a) of this section if it surrenders the license before meeting all milestone requirements or if it fails to meet any milestone deadline set forth in §25.164, and, at the time of milestone deadline, the licensee has not



provided a sufficient basis for extending the milestone.

\* \* \* \* \*

(e) A replacement space station is one that:

- (1) is authorized to operate at an orbital location within  $\pm 0.15^\circ$  of the assigned location of a GSO space station to be replaced or is authorized for NGSO operation and will replace an existing NGSO space station in its authorized orbit;
- (2) is authorized to operate in the same frequency bands, and with the same coverage area as the space station to be replaced; and
- (3) is scheduled to be launched so that it will be brought into use at approximately the same time as, but no later than, the existing space station is retired.

(f) An applicant that has submitted a Coordination Request pursuant to §25.110(b)(3)(i) or an Appendix 30B filing pursuant to §25.110(b)(3)(ii) must obtain a surety bond in the amount of \$500,000 in accordance with the requirements in paragraph (b) of this section for licensees. The application will be returned as defective pursuant to §25.112 if a copy of the required bond is not filed with the Commission within 30 days after release of a public notice announcing that the Commission has submitted the Coordination Request or Appendix 30B filing to the ITU.

(g) An applicant will be considered to be in default with respect to a bond filed pursuant to paragraph (f) of this section if the applicant fails to submit a complete, acceptable license application pursuant to §25.110(b)(3)(iii) for the operation proposed in the initial application materials filed pursuant to §25.110(b)(3)(i) or (ii) within two years of the date of submission of the initial application materials.

38. In § 25.202, revise the table and footnotes in paragraph (a)(1) and paragraph (g) to read as follows:

§ 25.202 Frequencies, frequency tolerance, and emission limits.

(a) (1) \* \* \*

Space-to-Earth (GHz)	Earth-to-space (GHz)
3.6-3.65	5.091-5.25 <sup>6</sup>
3.65-3.7	5.85-5.925
3.7-4.2	5.925-6.425
4.5-4.8	6.425-6.525
6.7-7.025 <sup>6</sup>	6.525-6.7
7.025-7.075	6.7-7.025
10.7-11.7 <sup>6</sup>	7.025-7.075
11.7-12.2	12.7-12.75
12.2-12.7	12.75-13.25 <sup>6</sup>
18.3-18.58	13.75-14

18.58-18.8	14-14.2
18.8-19.3	14.2-14.5
19.3-19.7	15.43-15.63 <sup>6</sup>
19.7-20.2	17.3-17.8
37.5-40 <sup>1</sup>	24.75-25.05
40-42	25.05-25.25
	27.5-28.35
	28.35-28.6 <sup>2</sup>
	28.6-29.1 <sup>3</sup>
	29.1-29.25 <sup>4</sup>
	29.25-29.5 <sup>5</sup>
	29.5-30.0 <sup>2</sup>
	47.2-50.2

<sup>1</sup> Use of this band by the FSS is limited to gateway earth station operations, provided the licensee under this Part obtains a license under part 101 of this chapter or an agreement from a part 101 licensee for the area in which an earth station is to be located. Satellite earth station facilities in this band may not be ubiquitously deployed and may not be used to serve individual consumers.

<sup>2</sup> This band is primary for GSO FSS and secondary for NGSO FSS.

<sup>3</sup> This band is primary for NGSO FSS and secondary for GSO FSS.

<sup>4</sup> This band is primary for NGSO MSS feeder links and LMDS hub-to-subscriber transmission.

<sup>5</sup> This band is primary for NGSO MSS feeder links and GSO FSS.

<sup>6</sup> Use of this band by NGSO FSS systems is limited to transmissions to or from gateway earth stations.

\* \* \* \* \*

(g)(1) Telemetry, tracking, and command signals may be transmitted in frequencies within the assigned bands that are not at a band edge only if the transmissions cause no greater interference and require no greater protection from harmful interference than the communications traffic on the satellite network or have been coordinated with operators of authorized co-frequency space stations at orbital locations within six degrees of the assigned orbital location.

(2) Frequencies, polarization, and coding of telemetry, tracking, and command transmissions must be selected to minimize interference into other satellite networks.

39. In § 25.203, add paragraph (c)(6) and revise the first sentence in paragraph (f), paragraph (g)(1), and paragraph (j) to read as follows:

§ 25.203 Choice of sites and frequencies.

\* \* \* \* \*

(c) \* \* \*

(6) Multiple antennas in an NGSO FSS gateway earth station complex located within an area bounded by one second of latitude and one second of longitude may be regarded as a single earth station for purposes of coordination with terrestrial services.

\* \* \* \* \*

(f) Notification to the National Radio Astronomy Observatory: In order to minimize possible harmful interference at the National Radio Astronomy Observatory site at Green Bank, Pocahontas County, W. Va., and at the Naval Radio Research Observatory site at Sugar Grove, Pendleton County, W. Va., any applicant for operating authority under this part for a new transmit or transmit-receive earth station, other than a mobile or temporary fixed station, within the area bounded by 39°15' N. on the north, 78°30' W. on the east, 37°30' N. on the south and 80°30' W. on the west or for modification of an existing license for such station to change the station's frequency, power, antenna height or directivity, or location must, when filing the application with the Commission, simultaneously notify the Director, National Radio Astronomy Observatory, P.O. Box No. 2, Green Bank, W. Va. 24944, in writing, of the technical particulars of the proposed station. \* \* \*

(g) \* \* \*

(1) Applicants for authority to operate a new transmitting earth station in the vicinity of an FCC monitoring station or to modify the operation of a transmitting earth station in a way that would increase the field strength produced at such a monitoring station above that previously authorized should consider the possible need to protect the FCC stations from harmful interference. Geographic coordinates of the facilities that require protection are listed in §0.121(c) of this chapter. Applications for fixed stations that will produce field strength greater than 10 mV/m or power flux density greater than -65.8 dBW/m<sup>2</sup> in the authorized emission bandwidth at any of the referenced coordinates may be examined to determine the extent of possible interference. Depending on the theoretical field strength value and existing root-sum-square or other ambient radio field signal levels at the referenced coordinates, a condition to protect the monitoring station may be included in the station authorization.

\* \* \* \* \*

(j) Applicants for NGSO 1.6/2.4 GHz Mobile-Satellite Service/Radiodetermination-Satellite Service feeder links in the 17.7-20.2 GHz and 27.5-30.0 GHz bands must coordinate with licensees of FSS and terrestrial-service systems sharing the band to determine geographic protection areas around each NGSO MSS/Radiodetermination-Satellite Service feeder-link earth station.

\* \* \* \* \*

40. In § 25.204, remove the last sentence in paragraph (e)(1).

§ 25.204 [Amended]

41. In § 25.205, revise the section heading and paragraph (a) to read as follows, remove paragraphs (b) and (c), revise paragraph (d) and redesignate as paragraph (b), to read as follows:

§ 25.205 Minimum antenna elevation angle.

(a) Earth station antennas must not transmit at elevation angles less than five degrees, measured from the horizontal plane to the direction of maximum radiation, in a frequency band shared with terrestrial radio services or in a frequency band with an allocation to space services operating in both the Earth-to-space and space-to-Earth directions. In other bands, earth station antennas must not transmit at elevation angles

less than three degrees. In some instances, it may be necessary to specify greater minimum elevation angles because of interference considerations.

(b) ESAAs in aircraft on the ground must not transmit at elevation angles less than three degrees. There is no minimum angle of antenna elevation for ESAAs while airborne.

42. In § 25.209, revise paragraphs (a), (b), (c), (e), (f) and (h) to read as follows:

§ 25.209 Earth station antenna performance standards.

(a) Except as provided in paragraph (f) of this section, the co-polarization gain of any earth station antenna operating in the FSS and transmitting to a GSO satellite, including earth stations providing feeder links for satellite services other than FSS, may not exceed the following limits:

(1) In the plane tangent to the GSO arc, as defined in §25.103, for earth stations not operating in the conventional Ku-band, the 24.75-25.25 GHz band, or the 28.35-30 GHz band:

$29 - 25\log_{10}\theta$	dBi	for	$1.5^\circ \leq \theta \leq 7^\circ$
8	dBi	for	$7^\circ < \theta \leq 9.2^\circ$
$32 - 25\log_{10}\theta$	dBi	for	$9.2^\circ < \theta \leq 48^\circ$
-10	dBi	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite, and dBi refers to dB relative to an isotropic radiator. This envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from  $\pm 7$ -180°, and by up to 6 dB in the region of main reflector spillover energy.

(2) In the plane tangent to the GSO arc, for earth stations operating in the conventional Ku-band:

$29 - 25\log_{10}\theta$	dBi	for	$1.5^\circ \leq \theta \leq 7^\circ$
8	dBi	for	$7^\circ < \theta \leq 9.2^\circ$
$32 - 25\log_{10}\theta$	dBi	for	$9.2^\circ < \theta \leq 19.1^\circ$
0	dBi	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section. This envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from  $\pm 7$ -180°, and by up to 6 dB in the region of main reflector spillover energy.

(3) In the plane tangent to the GSO arc, for earth stations operating in the 24.75-25.25 GHz or 28.35-30 GHz bands:

$29 - 25\log_{10}\theta$	dBi	for	$2^\circ \leq \theta \leq 7^\circ$
8	dBi	for	$7^\circ < \theta \leq 9.2^\circ$
$32 - 25\log_{10}\theta$	dBi	for	$9.2^\circ < \theta \leq 19.1^\circ$

0	dBi	for	$19.1^\circ < \theta \leq 180^\circ$
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where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section. This envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from  $\pm 7$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(4) In the plane perpendicular to the GSO arc, as defined in §25.103, for earth stations not operating in the conventional Ku-band, the 24.75-25.25 GHz band, or the 28.35-30 GHz band:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

$32 - 25\log_{10}\theta$	dBi	for	$3^\circ < \theta \leq 48^\circ$
-10	dBi	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section. This envelope may be exceeded by up to 6 dB in 10% of the range of  $\theta$  angles from  $\pm 3$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(5) In the plane perpendicular to the GSO arc, for earth stations operating in the conventional Ku-band:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

$32 - 25\log_{10}\theta$	dBi	for	$3^\circ < \theta \leq 19.1^\circ$
0	dBi	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section. This envelope may be exceeded by up to 6 dB in 10% of the range of  $\theta$  angles from  $\pm 3$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(6) In the plane perpendicular to the GSO arc, for earth stations operating in the 24.75-25.25 GHz or 28.35-30 GHz bands:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

$32 - 25\log_{10}\theta$	dBi	for	$3.5^\circ < \theta \leq 7^\circ$
10.9	dBi	for	$7^\circ < \theta \leq 9.2^\circ$
$35 - 25\log_{10}\theta$	dBi	for	$9.2^\circ < \theta \leq 19.1^\circ$
3	dBi	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section. This envelope may be exceeded by up to 6 dB in 10% of the range of  $\theta$  angles from  $\pm 3$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(b) Except as provided in paragraph (f) of this section, the off-axis cross-polarization gain of any antenna used for transmission from an FSS earth station to a GSO satellite, including earth stations providing feeder links for satellite services other than FSS, may not exceed the following limits:

(1) In the plane tangent to the GSO arc, for earth stations not operating in the 24.75-25.25 GHz or

28.35-30 GHz bands:

19 - $25\log_{10}\theta$	dBi	for	$1.8^\circ < \theta \leq 7^\circ$
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where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section.

(2) In the plane perpendicular to the GSO arc, for earth stations not operating in the 24.75-25.25 GHz or 28.35-30 GHz bands:

19 - $25\log_{10}\theta$	dBi	for	$3^\circ < \theta \leq 7^\circ$
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where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section.

(3) In the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc, for earth stations operating in the 24.75-25.25 GHz or 28.35-30 GHz bands:

19 - $25\log_{10}\theta$	dBi	for	$2^\circ < \theta \leq 7^\circ$
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where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section.

(c)(1) An earth station licensed for operation with an FSS space station or registered for reception of transmissions from such a space station pursuant to §25.131(b) and (d) is not entitled to protection from interference from authorized operation of other stations that would not cause harmful interference to that earth station if it were using an antenna with receive-band gain patterns conforming to the levels specified in paragraphs (a) and (b) of this section.

(2) A 17/24 GHz BSS telemetry earth station is not entitled to protection from harmful interference from authorized space station operation that would not cause harmful interference to that earth station if it were using an antenna with receive-band gain patterns conforming to the levels specified in paragraphs (a) and (b) of this section. Receive-only earth stations in the 17/24 GHz BSS are entitled to protection from harmful interference caused by other space stations to the extent indicated in §25.224.

\* \* \* \* \*

(e) An earth station using asymmetrical antennas without skew angle adjustment capability must comply with the gain values specified in paragraph (a)(1) of this section, in the plane orthogonal to the to the main plane of the antenna, or, alternatively, in the plane corresponding to the maximum skew angle experienced at any location at which the earth station may be located.

(f) A GSO FSS earth station with an antenna that does not conform to the applicable standards in paragraphs (a) and (b) of this section will be authorized only if the applicant demonstrates that the antenna will not cause unacceptable interference. This demonstration must comply with the requirements in §§25.138, 25.218, 25.220, 25.221, 25.222, 25.223, 25.226, or 25.227, as appropriate.

\* \* \* \* \*

(h) The gain of any transmitting antenna in a gateway earth station communicating with NGSO FSS satellites in the 10.7-11.7 GHz, 12.75-13.15 GHz, 13.2125-13.25 GHz, 13.8-14.0 GHz, and/or 14.4-14.5 GHz bands must lie below the envelope defined as follows:

29 - $25\log_{10}(\theta)$	dBi	for	$1^\circ \leq \theta \leq 36^\circ$
-10	dBi	for	$36^\circ \leq \theta \leq 180^\circ$

where  $\theta$  and dBi are as defined in paragraph (a)(1) of this section. This envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from  $\pm 7$ -180°.



43. In § 25.210, remove and reserve paragraph (a) and revise paragraph (i) to read as follows:

§ 25.210 Technical requirements for space stations.

\* \* \* \* \*

(i) Space station antennas in the 17/24 GHz BSS must be designed to provide a cross-polarization isolation such that the ratio of the on axis co-polar gain to the cross-polar gain of the antenna in the assigned frequency band shall be at least 25 dB within its primary coverage area.

\* \* \* \* \*

44. In § 25.211, remove and reserve paragraph (a) and revise paragraphs (b), (d)(2), (d)(3) and (e) to read as follows:

§ 25.211 Analog video transmissions in the FSS.

(a) [Reserved]

(b) All conventional C-band analog video transmissions must contain an energy dispersal signal at all times with a minimum peak-to-peak bandwidth set at whatever value is necessary to meet the power flux density limits specified in §25.208(a) and successfully coordinated internationally and accepted by adjacent U.S. satellite operators based on the use of state of the art space and earth station facilities. All transmissions in frequency bands described in §25.208 (b) and (c) must also contain an energy dispersal signal at all times with a minimum peak-to-peak bandwidth set at whatever value is necessary to meet the power flux density limits specified in §25.208(b) and (c) and successfully coordinated internationally and accepted by adjacent U.S. satellite operators based on the use of state of the art space and earth station facilities.

\* \* \* \* \*

(d) \* \* \*

(2) For transmission in the 5925-6425 MHz band, the input power into the antenna will not exceed 26.5 dBW; or

(3) For transmission in the 14.0-14.5 GHz band, the input power into the antenna will not exceed 27 dBW.

(e) Applications for authority for analog video uplink transmission in the 5925-6425 MHz or 14.0-14.5 GHz bands that are not eligible for routine processing under paragraph (d) of this section are subject to the requirements of §25.220.

45. In § 25.212, revise paragraphs (c), (d), and (e) to read as follows and add paragraphs (g) and (h):

§ 25.212 Narrowband analog transmissions and digital transmissions in the GSO FSS.

\* \* \* \* \*

(c)(1) An earth station that is not subject to licensing under §§25.222, 25.226, or 25.227 may be routinely licensed for analog transmissions in the conventional Ku-band or the extended Ku-band with bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) if the input power spectral density into the antenna will not exceed -8 dBW/4 kHz, and the application includes certification pursuant to §25.132(a)(1) of conformance with the antenna gain performance requirements in §25.209(a) and (b).

(2) An earth station that is not subject to licensing under §§25.222, 25.226, or 25.227 may be routinely licensed for digital transmission, including digital video transmission, in the conventional Ku-band or

the extended Ku-band if input power spectral density into the antenna will not exceed -14 dBW/4 kHz and the application includes certification pursuant to §25.132(a)(1) of conformance with the antenna gain performance requirements in §25.209(a) and (b).

(d) An individual earth station that is not subject to licensing under §25.221 may be routinely licensed for digital transmission, or for analog transmission with carrier bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) in the conventional C-band or the extended C-band, if the applicant certifies conformance with relevant antenna performance standards in §25.209(a) and (b), and power density into the antenna will not exceed +0.5 dBW/4 kHz for analog carriers or -2.7 dBW/4 kHz for digital carriers.

(e) An earth station may be routinely licensed for digital transmission in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands if the input power spectral density into the antenna will not exceed 3.5 dBW/MHz and the application includes certification pursuant to §25.132(a)(1) of conformance with the antenna gain performance requirements in §25.209(a) and (b).

\* \* \* \* \*

(g) A license application for earth station operation in a network using variable power density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the applicable off-axis EIRP density limits permissible for a single earth station, as specified in §§25.218 or 25.138.

(h) Applications for authority for fixed earth station operation in the conventional C-band, the extended C-band, the conventional Ku-band, the extended Ku-band or the conventional Ka-band that do not qualify for routine processing under relevant criteria in this section, §§25.211, 25.218, or 25.138, are subject to the requirements in §25.220.

46. In § 25.218, revise paragraphs (a)-(h) and add paragraph (i) to read as follows:

§ 25.218 Off-axis EIRP density envelopes for FSS earth stations transmitting in certain frequency bands.

(a) This section applies to applications for FSS earth stations transmitting to GSO space stations in the conventional C-band, extended C-band, conventional Ku-band, or extended Ku-band with the following exceptions:

(1) ESV, VMES, and ESAA applications and

(2) Applications proposing transmission of analog command signals at a band edge with bandwidths greater than 1 MHz or transmission of any other type of analog signal with bandwidths greater than 200 kHz.

(b) Earth station applications subject to this section may be routinely processed if they meet the applicable off-axis EIRP density envelopes set forth in this section.

(c) Analog earth station operation in the conventional or extended C-bands.

(1) For co-polarized transmissions in the plane tangent to the GSO arc, as defined in §25.103:

29.5 - $25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
8.5	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
32.5 - $25\log_{10}\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 48^\circ$

-9.5	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$
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where  $\theta$  is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ -180°, and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc, as defined in §25.103:

$32.5 - 25\log_{10}\theta$	dBW/4 kHz	for	$3^\circ \leq \theta \leq 48^\circ$
-9.5	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

$19.5 - 25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
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where  $\theta$  is as defined in paragraph (c)(1) of this section.

(d) Digital earth station operation in the conventional or extended C-bands.

(1) For co-polarized transmissions in the plane tangent to the GSO arc:

$26.3 - 25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
5.3	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
$29.3 - 25\log_{10}\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 48^\circ$
-12.7	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ -180°, and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

$29.3 - 25\log_{10}\theta$	dBW/4 kHz	for	$3^\circ \leq \theta \leq 48^\circ$
-12.7	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

$16.3 - 25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
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where  $\theta$  is as defined in paragraph (c)(1) of this section.

(4) A license application for earth station operation in a network using variable power density control of

earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (d)(1)-(d)(3) of this section.

(e) Analog earth station operation in the conventional Ku-band.

(1) For co-polarized transmissions in the plane tangent to the GSO arc:

$21 - 25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
0	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
$24 - 25\log_{10}\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 19.1^\circ$
-8	dBW/4 kHz	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

$24 - 25\log_{10}\theta$	dBW/4 kHz	for	$3^\circ \leq \theta \leq 19.1^\circ$
-8	dBW/4 kHz	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

$11 - 25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
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where  $\theta$  is as defined in paragraph (c)(1) of this section.

(f) Digital earth station operation in the conventional Ku-band.

(1) For co-polarized transmissions in the plane tangent to the GSO arc:

$15 - 25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
-6	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
$18 - 25\log_{10}\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 19.1^\circ$
-14	dBW/4 kHz	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

18 - $25\log_{10}\theta$	dBW/4 kHz	for	$3^\circ \leq \theta \leq 19.1^\circ$
-14	dBW/4 kHz	for	$19.1^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

5 - $25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
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where  $\theta$  is as defined in paragraph (c)(1) of this section.

(4) A license application for earth station operation in a network using variable power density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (f)(1)-(f)(3) of this section.

(g) Analog earth station operation in the extended Ku-band.

(1) For co-polarized transmissions in the plane tangent to the GSO arc:

21 - $25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
0	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
24 - $25\log_{10}\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 48^\circ$
-18	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(1) of this section. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

24 - $25\log_{10}\theta$	dBW/4 kHz	for	$3^\circ \leq \theta \leq 48^\circ$
-18	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

11 - $25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
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where  $\theta$  is as defined in paragraph (c)(1) of this section.

(h) Digital earth station operation in the extended Ku-band.

(1) For co-polarized transmissions in the plane tangent to the GSO arc:

15 - $25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
-6	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
18 - $25\log_{10}\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 48^\circ$
-24	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ - $180^\circ$ , and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

18 - $25\log_{10}\theta$	dBW/4 kHz	for	$3^\circ \leq \theta \leq 48^\circ$
-24	dBW/4 kHz	for	$48^\circ < \theta \leq 85^\circ$

where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

5 - $25\log_{10}\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
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where  $\theta$  is as defined in paragraph (c)(1) of this section.

(4) A license application for earth station operation in a network using variable power density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite receiving beam may be routinely processed if the applicant certifies that the aggregate off-axis EIRP density from all co-frequency earth stations transmitting simultaneously to the same target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the off-axis EIRP density limits permissible for a single earth station, as specified in paragraphs (h)(1)-(h)(3) of this section.

(i) Applications for authority for fixed earth station operation in the 5925-6425 GHz or 14.0-14.5 GHz band that do not qualify for routine processing under relevant criteria in this section, §§25.211 or 25.212 are subject to the requirements in §25.220.

47. In § 25.220, revise the section heading and paragraphs (a) and (b) to read as follows, remove and reserve paragraph (d)(1)(i), and revise paragraph (d)(2) to read as follows:

§ 25.220 Non-routine transmit/receive earth station operations.

(a) The requirements in this section apply to applications for, and operation of, earth stations transmitting in the conventional or extended C-bands, the conventional or extended Ku-bands, or the conventional Ka-band that do not qualify for routine licensing under relevant criteria in §§25.138, 25.211, 25.212, 25.218, 25.221(a)(1) or (3), 25.222(a)(1) or (3), 25.226(a)(1) or (3), or 25.227(a)(1) or (3).

(b) Applications filed pursuant to this section must include the information required by §25.115(g)(1).



\* \* \* \* \*

(d) \* \* \*

(2) Unless the non-routine uplink transmission levels are permitted under a coordination agreement with the space station operator, or unless coordination with the operator is not required pursuant to §25.140(d)(3) or (4), the operator of an earth station licensed pursuant to this section must reduce its transmitted EIRP density to levels at or within relevant routine limits:

(i) toward the part of the geostationary orbit arc within one degree of a subsequently launched, two-degree-compliant space station receiving in the same uplink band at an orbital location within six degrees of the earth station's target satellite, and

(ii) toward a two-degree-compliant space station receiving in the same uplink band at an orbital location more than six degrees away from the target satellite if co-frequency reception by the space station is adversely affected by the non-routine earth station transmission levels.

\* \* \* \* \*

48. In § 25.221, revise the section heading, paragraphs (a)(1)(i), (a)(2), (a)(3), (b) introductory text, and (b)(1) introductory text to read as follows, remove and reserve paragraphs (b)(1)(i) and (ii), and revise paragraphs (b)(2) and (3) to read as follows:

§ 25.221 Blanket licensing provisions for ESVs operating with GSO FSS space stations in the 3700-4200 MHz and 5925-6425 MHz bands.

(a) \* \* \*

(1) \* \* \*

(i) \* \* \*

(A) Off-axis EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in §25.103, shall not exceed the following values:

26.3 - 25log $\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
5.3	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
29.3 - 25log $\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 48^\circ$
-12.7	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

Where theta ( $\theta$ ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ -180°, and by up to 6 dB in the region of main reflector spillover energy.

(B) In the plane perpendicular to the GSO arc, as defined in §25.103, EIRP spectral density of co-polarized signals shall not exceed the following values:

29.3 - 25log $\theta$	dBW/4 kHz	for	$3.0^\circ \leq \theta \leq 48^\circ$
-12.7	dBW/4 kHz	for	$48^\circ < \theta \leq 180^\circ$

Where  $\theta$  is as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target

satellite.

(C) The off-axis EIRP spectral-density of cross-polarized signals shall not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc:

16.3 - 25log $\theta$	dBW/4 kHz	for	$1.8^\circ \leq \theta \leq 7.0^\circ$
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Where  $\theta$  is as defined in paragraph (a)(1)(i)(A) of this section.

\* \* \* \* \*

(2) The following requirements apply to ESV systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) An ESV or ESV system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

(ii) Any ESV transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.

(iii) A system with variable power control of individual ESV transmitters must monitor the aggregate off-axis EIRP density from simultaneously transmitting ESV transmitters at the system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP-density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications, and the transmitters must comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to an ESV system that uses variable power control of individual earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the ESV system operates pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from co-frequency earth stations in each target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the limits defined in paragraph (a)(1)(i) of this section.

(ii) Each ESV transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) Aggregate power density from simultaneously transmitting ESV transmitters must be monitored at the system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for ESV operation in the 5925-6425 MHz (Earth-to-space) band to GSO satellites in the FSS must include, in addition to the particulars of operation identified on FCC Form 312, and associated Schedule B, applicable technical demonstrations or certifications pursuant to paragraph (b)(1), (b)(2), or (b)(3) of this section and the documentation identified in paragraphs (b)(4) through (b)(6) of this section.

(1) An ESV applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by §25.115(g)(1). An applicant proposing to implement a transmitter

under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An ESV applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(2) An applicant proposing to operate with off-axis EIRP density in excess of the levels specified in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

(i) off-axis EIRP density data pursuant to §25.115(g)(1);

(ii) the certifications required by §25.220(d);

(iii) a detailed showing that each ESV transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator;

(iv) a detailed showing that the aggregate power density from simultaneously transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESV transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command; and

(v) a certification that the ESV system will operate in compliance with the power limits in §25.204(h).

(3) An applicant proposing to implement an ESV system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

(i) off-axis EIRP density data pursuant to §25.115(g)(1);

(ii) a detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section;

(iii) a detailed showing that each ESV terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section;

(iv) a detailed showing that the aggregate power density from simultaneously transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command; and

(v) certification that the ESV system will operate in compliance with the power limits in §25.204(h).

\* \* \* \* \*

49. In § 25.222, revise the section heading, paragraphs (a)(1)(i), (a)(2), and (a)(3) to read as follows, revise paragraph (b) introductory text and paragraph (b)(1) introductory text to read as follows, remove and reserve paragraphs (b)(1)(i) and (ii), and revise paragraphs (b)(2) and (3) to read as follows:

§ 25.222 Blanket licensing provisions for ESVs operating with GSO FSS space stations in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz, and 14.0-14.5 GHz bands.

(a) \* \* \*

(1) \* \* \*

(i) \* \* \*

(A) Off-axis EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in §25.103, shall not exceed the following values:

15 - 25log $\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
-6	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
18 - 25log $\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 19.1^\circ$
-14	dBW/4kHz	for	$19.1^\circ < \theta \leq 180^\circ$

Where theta ( $\theta$ ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ -180°, and by up to 6 dB in the region of main reflector spillover energy.

(B) The off-axis EIRP density of co-polarized signals shall not exceed the following values in the plane perpendicular to the GSO arc, as defined in §25.103:

18 - 25log $\theta$	dBW/4 kHz	for	$3.0^\circ \leq \theta \leq 19.1^\circ$
-14	dBW/4kHz	for	$19.1^\circ < \theta \leq 180^\circ$

Where  $\theta$  is as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(C) The off-axis EIRP density of cross-polarized signals shall not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc:

5 - 25log $\theta$	dBW/4 kHz	for	$1.8^\circ \leq \theta \leq 7.0^\circ$
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Where  $\theta$  is as defined in paragraph (a)(1)(i)(A) of this section.

\* \* \* \* \*

(2) The following requirements apply to ESV systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) An ESV or ESV system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

(ii) Any ESV transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.

(iii) A system with variable power control of individual ESV transmitters must monitor the aggregate off-axis EIRP density from simultaneously transmitting ESV transmitters at the system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes

aggregate off-axis EIRP density to exceed the off-axis EIRP-density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications, and the transmitters must comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to an ESV system that uses variable power control of individual earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the ESV system operates pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from co-frequency earth stations in each target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the limits defined in paragraph (a)(1)(i) of this section.

(ii) Each ESV transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) Aggregate power density from simultaneously transmitting ESV transmitters must be monitored at the system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for ESV operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the FSS must include, in addition to the particulars of operation identified on FCC Form 312, and associated Schedule B, applicable technical demonstrations or certifications pursuant to paragraph (b)(1), (b)(2), or (b)(3) of this section and the documentation identified in paragraphs (b)(4) through (6) of this section.

(1) An ESV applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by §25.115(g)(1). An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An ESV applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(2) An applicant proposing to operate with off-axis EIRP density in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

(i) off-axis EIRP density data pursuant to §25.115(g)(1);

(ii) the certifications required by §25.220(d);

(iii) a detailed showing that each ESV transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator; and

(iv) a detailed showing that the aggregate power density from simultaneously transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESV transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command.

(3) An applicant proposing to implement an ESV system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

- (i) off-axis EIRP density data pursuant to §25.115(g)(1);
- (ii) a detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section;
- (iii) a detailed showing that each ESV terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section; and
- (iv) a detailed showing that the aggregate power density from simultaneously transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

50. In § 25.223, revise paragraphs (b), (c), and (d) to read as follows:

§ 25.223 Alternative licensing rules for feeder-link earth stations in the 17/24 GHz BSS.

\* \* \* \* \*

(b) Applications for earth station licenses in the 24.75-25.25 GHz portion of 17/24 GHz BSS may be routinely processed if they meet the following requirements:

(1) The EIRP density of co-polarized signals will not exceed the following values in the plane tangent to the GSO arc, as defined in §25.103, under clear sky conditions:

$32.5 - 25\log(\theta)$	dBW/MHz	for	$2^\circ \leq \theta \leq 7^\circ$
11.4	dBW/MHz	for	$7^\circ \leq \theta \leq 9.2^\circ$
$35.5 - 25\log(\theta)$	dBW/MHz	for	$9.2^\circ \leq \theta \leq 19.1^\circ$
3.5	dBW/MHz	for	$19.1^\circ \leq \theta \leq 180^\circ$

Where  $\theta$  is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite.

(2) The EIRP density of co-polarized signals will not exceed the following values under clear sky conditions in the plane perpendicular to the GSO arc, as defined in §25.103:

$35.5 - 25\log(\theta)$	dBW/MHz	for	$2^\circ \leq \theta \leq 7^\circ$
14.4	dBW/MHz	for	$7^\circ \leq \theta \leq 9.2^\circ$
$38.5 - 25\log(\theta)$	dBW/MHz	for	$9.2^\circ \leq \theta \leq 19.1^\circ$
6.5	dBW/MHz	for	$19.1^\circ \leq \theta \leq 180^\circ$

Where  $\theta$  is as defined in paragraph (b)(1) of this section.



(3) The EIRP density levels specified in paragraphs (a)(1) and (2) of this section may be exceeded by up to 3 dB for values of  $\theta > 7^\circ$ , in 10% of the range of theta ( $\theta$ ) angles from  $7^\circ$ - $180^\circ$  on each side of the line from the earth station to the target satellite.

(4) The EIRP density of cross-polarized signals will not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc, under clear sky conditions:

22.5 - 25log( $\theta$ )	dBW/MHz	for	$2^\circ \leq \theta \leq 7^\circ$
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Where  $\theta$  is as defined in paragraph (b)(1) of this section.

(c) An applicant proposing levels in excess of those specified in paragraph (b) of this section must certify that potentially affected parties acknowledge and do not object to the use of the applicant's higher EIRP densities.

(1) For proposed non-conforming EIRP density levels up to 3 dB in excess of the limits defined in paragraph (b) of this section, potentially affected parties are operators of co-frequency U.S.-authorized 17/24 GHz BSS space stations at angular separations of up to  $\pm 6^\circ$  from the proposed satellite points of communication. For proposed EIRP density levels more than 3 dB but not more than 6 dB in excess of the limits defined in paragraph (b) of this section, potentially affected parties are operators of co-frequency U.S.-authorized space stations up to  $\pm 10^\circ$  from the proposed satellite points of communication.

(2) Notwithstanding paragraph (c)(1) of this section, an applicant need not certify that the operator of a co-frequency space station consents to proposed non-conforming operation if EIRP density from the proposed earth station will not exceed the levels specified in paragraph (b) toward any position in the geostationary arc within one degree of the assigned orbital location of the co-frequency space station.

(3) Power density levels more than 6 dB in excess of the limits defined in paragraph (b) of this section will not be permitted.

(d)(1) The operator of an earth station licensed pursuant to paragraph (c) of this section will bear the burden of coordinating with the operator of a co-frequency space station subsequently licensed by the Commission for operation at an orbital location  $10^\circ$  or less from the earth station's target satellite if the co-frequency space station's reception of conforming uplink transmissions is, or would be, adversely affected by the earth station's non-conforming operation. If no agreement is reached, the earth station operator must reduce EIRP density toward that co-frequency space station to a level in conformance with the envelopes specified in paragraph (b) of this section.

(2) The operator of an earth station licensed pursuant to paragraph (c)(1) or (c)(2) of this section must reduce EIRP density to levels at or within those specified in paragraph (b) toward a U.S.-licensed space station receiving in the same uplink band at an angular separation from the earth station's target satellite greater than is required in paragraph (c)(1) of this section, if the co-frequency space station's reception of conforming uplink transmissions is adversely affected by the non-conforming earth station operation, unless the non-conforming operation is permitted under a coordination agreement with the operator of the co-frequency space station.

51. In § 25.226, revise the section heading, paragraphs (a)(1)(i), (a)(2), and (a)(3), (b) introductory text, and (b)(1), introductory text, remove and reserve paragraphs (b)(1)(i) and (ii), and revise paragraphs (b)(2) and (b)(3) to read as follows:

§ 25.226 Blanket licensing provisions for domestic, U.S. VMESs operating with GSO FSS space stations in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz, and 14.0-14.5 GHz bands.

(a) \* \* \*

(1) \* \* \*

(i) \* \* \*

(A) Off-axis EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in §25.103, shall not exceed the following values:

15 - 25log $\theta$	dBW/4 kHz	for	$1.5^\circ \leq \theta \leq 7^\circ$
-6	dBW/4 kHz	for	$7^\circ < \theta \leq 9.2^\circ$
18 - 25log $\theta$	dBW/4 kHz	for	$9.2^\circ < \theta \leq 19.1^\circ$
-14	dBW/4 kHz	for	$19.1^\circ < \theta \leq 180^\circ$

where theta ( $\theta$ ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ -180°, and by up to 6 dB in the region of main reflector spillover energy.

(B) The off-axis EIRP spectral density of co-polarized signals shall not exceed the following values in the plane perpendicular to the GSO arc, as defined in §25.103:

18 - 25log $\theta$	dBW/4 kHz	for	$3.0^\circ \leq \theta \leq 19.1^\circ$
-14	dBW/4 kHz	for	$19.1^\circ < \theta \leq 180^\circ$

Where  $\theta$  is as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(C) The EIRP density of cross-polarized signals shall not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc:

5 - 25log $\theta$	dBW/4 kHz	for	$1.8^\circ \leq \theta \leq 7.0^\circ$
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where  $\theta$  is as defined in paragraph (a)(1)(i)(A) of this section.

\* \* \* \* \*

(2) The following requirements apply to VMES systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) A VMES or VMES system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

(ii) Any VMES transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.

(iii) A system with variable power control of individual VMES transmitters must monitor the aggregate off-axis EIRP density from simultaneously transmitting VMES transmitters at the system's network control and monitoring center. If simultaneous operation of two or more VMES transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those

specifications and the transmitters must comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to a VMES system that uses variable power control of individual VMES earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the system operates pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from co-frequency earth stations in each target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the limits defined in paragraph (a)(1)(i) of this section.

(ii) Each VMES transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) Aggregate power density from simultaneously transmitting VMES transmitters must be monitored at the system's network control and monitoring center. If simultaneous operation of two or more transmitters in a VMES network causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for VMES operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the FSS must include, in addition to the particulars of operation identified on FCC Form 312, and associated Schedule B, applicable technical demonstrations pursuant to paragraph (b)(1), (b)(2), or (b)(3) of this section and the documentation identified in paragraphs (b)(4) through (b)(8) of this section.

(1) A VMES applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by §25.115(g)(1). An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(2) An applicant proposing to operate with off-axis EIRP density in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

(i) off-axis EIRP density data pursuant to §25.115(g)(1);

(ii) the certifications required by §25.220(d);

(iii) a detailed showing that each VMES transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator; and

(iv) a detailed showing that the aggregate power density from simultaneously transmitting VMES transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more VMES transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command.

(3) An applicant proposing to implement a VMES system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

- (i) off-axis EIRP density data pursuant to §25.115(g)(1);
- (ii) a detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section;
- (iii) a detailed showing that each VMES terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section; and
- (iv) a detailed showing that the aggregate power density from simultaneously transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more transmitters in the VMES network causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

52. In § 25.227, revise the section heading, paragraphs (a)(1)(i), (a)(2), (a)(3), (b) introductory text, and (b)(1) introductory text to read as follows, remove and reserve paragraphs (b)(1)(i) and (ii), and revise paragraphs (b)(2) and (b)(3) to read as follows:

§ 25.227 Blanket licensing provisions for ESAAs operating with GSO FSS space stations in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz, and 14.0-14.5 GHz bands.

(a) \* \* \*

(1) \* \* \*

(i) \* \* \*

(A) EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in §25.103, must not exceed the following values:

15 - 25 log <sub>10</sub> θ	dBW/4 kHz	for	1.5° ≤ θ ≤ 7°
-6	dBW/4 kHz	for	7° < θ ≤ 9.2°
18 - 25 log <sub>10</sub> θ	dBW/4 kHz	for	9.2° < θ ≤ 19.1°
-14	dBW/4 kHz	for	19.1° < θ ≤ 180°

where theta (θ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for θ > 7° may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180°, and by up to 6 dB in the region of main reflector spillover energy.

(B) The EIRP spectral density of co-polarized signals must not exceed the following values in the plane perpendicular to the GSO arc, as defined in §25.103:

18 - 25logθ	dBW/4 kHz	for	3.0° ≤ θ ≤ 19.1°
-14	dBW/4 kHz	for	19.1° < θ ≤ 180°

where θ is as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be

exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(C) The off-axis EIRP spectral-density of cross-polarized signals must not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc:

$5 - 25\log_{10}\theta$	dBW/4 kHz	for	$1.8^\circ < \theta \leq 7^\circ$
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where  $\theta$  is as defined in paragraph (a)(1)(i)(A) of this section.

\* \* \* \* \*

(2) The following requirements apply to ESAA systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) An ESAA or ESAA system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

(ii) Any ESAA transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.

(iii) A system with variable power control of individual ESAA transmitters must monitor the aggregate off-axis EIRP density from simultaneously transmitting ESAA transmitters at the system's network control and monitoring center. If simultaneous operation of two or more ESAA transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications, and the transmitters must comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to an ESAA system that uses variable power-density control of individual ESAA earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the system operates pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from co-frequency earth stations in each target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the limits specified in paragraph (a)(1)(i) of this section.

(ii) Each ESAA transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) A system with variable power control of individual ESAA transmitters must monitor aggregate power density from simultaneously transmitting ESAA transmitters at the network control and monitoring center. If simultaneous operation of two or more transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for ESAA operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the FSS shall include, in addition to the particulars of operation identified on FCC Form 312, and associated Schedule B, the applicable technical demonstrations in paragraphs (b)(1), (b)(2), or (b)(3), and the

documentation identified in paragraphs (b)(4) through (b)(8) of this section.

(1) An ESAA applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by §25.115(g)(1). An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(2) An ESAA applicant proposing to operate with off-axis EIRP density in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

(i) off-axis EIRP density data pursuant to §25.115(g)(1);

(ii) the certifications required by §25.220(d); and

(iii) a detailed showing that each ESAA transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator; and

(iv) a detailed showing that the aggregate power density from simultaneously transmitting ESAA transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESAA transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command.

(3) An applicant proposing to implement an ESAA system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

(i) off-axis EIRP density data pursuant to §25.115(g)(1);

(ii) a detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section;

(iii) a detailed showing that each ESAA terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section; and

(iv) a detailed showing that the aggregate power density from simultaneously transmitting ESAA transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more transmitters in the ESAA network causes aggregate off-axis EIRP density to exceed the off-axis density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

53. In § 25.257, revise the section heading and the second sentence in paragraph (e) to read as follows:

§ 25.257 Special requirements for NGSO MSS operations in the 29.1-29.25 GHz band regarding LMDS.

\* \* \* \* \*



(e) \* \* \* In this regard, any single NGSO MSS operator may identify only one feeder-link earth station complex protection zone in each category identified in §101.147(y)(2) of this chapter until the other NGSO MSS operator has been given an opportunity to select a location from the same category.

54. In § 25.258, revise the section heading and the first sentence in paragraph (b) to read as follows:

§ 25.258 Sharing between NGSO MSS feeder-link stations and GSO FSS services in the 29.25-29.5 GHz band.

\* \* \* \* \*

(b) Licensed GSO FSS earth stations in the vicinity of operational NGSO MSS feeder-link earth station complexes must, to the maximum extent possible, operate with frequency/polarization selections that will minimize unacceptable interference with reception of GSO FSS and NGSO MSS uplink transmissions in the 29.25-29.5 GHz band. \* \* \*

55. In § 25.264, revise the section heading, paragraph (a) introductory text and paragraph (a)(5) to read as follows, add paragraph (a)(6), and revise paragraph (b) introductory text, the second sentence in paragraph (b)(1), paragraph (b)(2)(ii), the first sentence in paragraph (b)(3), the first sentence in paragraph (c), the first sentence in paragraph (d) introductory text, and the first two sentences in paragraph (d)(1)(ii) to read as follows, and add paragraph (b)(4) to read as follows:

§25.264 Requirements to facilitate reverse-band operation in the 17.3-17.8 GHz band of 17/24 GHz BSS and DBS Service space stations.

(a) Each 17/24 GHz BSS space station applicant or licensee must submit a series of tables or graphs containing predicted off-axis gain data for each antenna that will transmit in the 17.3-17.8 GHz frequency band, in accordance with the following specifications. Using a Cartesian coordinate system wherein the X axis is tangent to the geostationary orbital arc with the positive direction pointing east, *i.e.*, in the direction of travel of the satellite; the Y axis is parallel to a line passing through the geographic north and south poles of the Earth, with the positive direction pointing south; and the Z axis passes through the satellite and the center of the Earth, with the positive direction pointing toward the Earth, the applicant or licensee must provide the predicted transmitting antenna off-axis antenna gain information: \* \* \*

(5) Over a greater angular measurement range, if necessary, to account for any planned spacecraft orientation bias or change in operating orientation relative to the reference coordinate system. The applicant or licensee must state the reasons for including such additional information.

(6) The predictive gain information must be submitted to the Commission when a license application is filed for a 17/24 GHz BSS space station or within 60 days after completion of critical design review for the space station, whichever occurs later.

(b) A 17/24 GHz BSS space station applicant or licensee must submit power flux density (pfd) calculations based on the predicted gain data submitted in accordance with paragraph (a) of this section, as follows:

(1) \* \* \* In this rule, the term prior-filed U.S. DBS space station refers to any co-frequency Direct Broadcast Satellite service space station for which an application was filed with the Commission, or an authorization was granted by the Commission, prior to the filing of the information and certifications required by paragraphs (a) and (b) of this section. \* \* \*

(2) \* \* \*

(ii) Indicate the extent to which the calculated pfd of the 17/24 GHz space station's transmissions in the 17.3-17.8 GHz band exceed the threshold pfd level of -117 dBW/m<sup>2</sup>/100 kHz at those prior-filed

U.S. DBS space station locations.

(3) If the calculated pfd exceeds the threshold level of -117 dBW/m<sup>2</sup>/100 kHz at the location of any prior-filed U.S. DBS space station, the applicant or licensee must also provide with the pfd calculations a certification that all affected DBS operators acknowledge and do not object to such higher off-axis pfd levels. \* \* \*

(4) The information and any certification required by paragraph (b) of this section must be submitted to the Commission when a license application is filed for a 17/24 GHz BSS space station or within 60 days after completion of critical design review for the space station, whichever occurs later. Otherwise, such information and certifications must be submitted to the Commission within 24 months after the grant of an operating license for a 17/24 GHz BSS space station or when the applicant or licensee certifies completion of critical design review, whichever occurs first.

(c) No later than 2 months prior to launch, each 17/24 GHz BSS space station licensee must update the predicted transmitting antenna off-axis gain information provided in accordance with paragraph (a) of this section by submitting measured transmitting antenna off-axis gain information over the angular ranges, measurement frequencies and polarizations specified in paragraphs (a)(1)-(5) of this section. \* \* \*

(d) No later than 2 months prior to launch, or when applying for authority to change the location of a 17/24 GHz BSS space station that is already in orbit, each 17/24 GHz BSS space station licensee must provide pfd calculations based on the measured off-axis gain data submitted in accordance with paragraph (c) of this section, as follows:

(1) \* \* \*

(ii) At the location of any subsequently filed U.S. DBS space station where the pfd level in the 17.3-17.8 GHz band calculated on the basis of measured gain data exceeds -117 dBW/m<sup>2</sup>/100 kHz. In this rule, the term subsequently filed U.S. DBS space station refers to any co-frequency Direct Broadcast Satellite service space station proposed in a license application filed with the Commission after the 17/24 GHz BSS operator submitted the predicted data required by paragraphs (a) through (b) of this section but before submission of the measured data required by this paragraph. \* \* \*

\* \* \* \* \*

56. In §25.271, revise paragraph (c)(5) and add paragraph (g) to read as follows:

§25.271 Particulars of operation.

\* \* \* \* \*

(c) \* \* \*

(5) Operators of blanket-licensed GSO FSS earth station networks that provide international service must maintain a control point within the United States, or maintain a point of contact within the United States available 24 hours a day, 7 days a week, with the ability to shut off any earth station within the network immediately upon notification of harmful interference.

\* \* \* \* \*

(g) Licensees of transmitting earth stations are prohibited from using remote earth stations in their networks that are not designed to stop transmission when synchronization to signals from the target satellite fails.

57. In § 25.275, add paragraph (e) to read as follows:

§ 25.275 Particulars of operation.

\* \* \* \* \*

(e) Transmission from an earth station of an unmodulated carrier at a power level sufficient to saturate a satellite transponder is prohibited, except as consented to by the space station licensee to determine transponder performance characteristics.

58. Add § 25.288 to read as follows:

§ 25.288 Obligation to remedy interference caused by NGSO MSS feeder downlinks in the 6700-6875 MHz band.

If an NGSO MSS satellite transmitting in the band 6700-6875 MHz causes harmful interference to previously licensed co-frequency Public Safety facilities, the satellite operator has an obligation to remedy the interference.

## APPENDIX C

## Final Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act (RFA),<sup>1</sup> an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the Further Notice of Proposed Rulemaking in the Matter of Comprehensive Review of Licensing and Operating Rules for Satellite Services.<sup>2</sup> The Commission sought written public comment on the proposals in the *Further Notice*, including comment on the IRFA. No comments were received on the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.<sup>3</sup>

**A. Need for, and Objectives of, the Rules**

This Order adopts comprehensive changes to Part 25 of the Commission's rules, which governs licensing and operation of space stations and earth stations for the provision of satellite communication services.<sup>4</sup> We revise the rules to, among other things, expedite international coordination of proposed satellite networks; eliminate burdens associated with our milestone requirements; more effectively deter warehousing under our post-licensing bond requirement; ensure continuity of service of satellite operations; and clarify and expand routine earth station licensing procedures.

This Order revises multiple sections of Part 25 of the rules. Specifically, it revises the rules to:

- 1) Allow space station applicants to file through the Commission a satellite network with the International Telecommunication Union up to two years before filing a complete and detailed space station application with the Commission.
- 2) Eliminate all of the space station construction milestones, except for the requirement to bring the space station(s) into operation at the assigned location(s) within a specified period of time.
- 3) Modify the space station bond requirements to increase liability over time to provide better incentives against spectrum warehousing.
- 4) Modify the two-degree spacing policy to permit continued operation of a non-two-degree compliant satellite network to the extent that the transmission levels are notified to the Commission, even if a later applicant does not consent to the higher levels.
- 5) Eliminate the requirement for a space station applicant that starts constructing its satellite prior to filing an application with the Commission to notify the Commission in writing that it is doing so at its own risk and expense.
- 6) Clarify the requirements to limit aggregate uplink power density from multiple earth stations transmitting to the same satellite.
- 7) Provide for the automatic grant of applications for repositioning of space stations with a small offset from the originally authorized orbital location, and for minor repointing of space station antennas.
- 8) Allow earth station operators to communicate with a replacement satellite that is deployed with a small offset from the originally authorized satellite without prior Commission authorization.

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<sup>1</sup> See 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 *et seq.*, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, Title II, 110 Stat. 847 (1996) (CWAAA).

<sup>2</sup> *Further Notice*, 29 FCC Rcd at 12230-34, Appendix D.

<sup>3</sup> See 5 U.S.C. § 604.

<sup>4</sup> 47 C.F.R. Part 25, Satellite Communications.

- 9) Extend the frequency bands in which “routine” earth station licensing is permitted.
- 10) Expand routine earth station license qualification options for applicants for earth station operation in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30.0 GHz bands.
- 11) Clarify earth station off-axis antenna radiation pattern requirements, and the ranges over which the off-axis radiated power can exceed the specified limits.
- 12) Require earth station applicants to file off-axis antenna radiation charts instead of tables except in off-axis angular regions where the off-axis radiation exceeds specified limits.
- 13) Eliminate the requirement for portable earth station manufacturers to demonstrate compliance with the radiated power limits in Section 25.204 of the Commission’s rules.
- 14) Lower the minimum permissible elevation angle for earth stations operating in bands not shared with terrestrial services or in which satellite networks operate bidirectionally from five degrees to three degrees above the horizontal plane.
- 15) Eliminate the restrictions on the center frequencies on which analog video transmissions in the 3700-4200 MHz band can be conducted.
- 16) Eliminate the restrictions on space station antenna polarization for space stations operating in the 3700-4200 MHz and 5925-6425 MHz bands, and the associated compliance demonstration requirements in the space station application form.
- 17) Eliminate the cross-polarization requirement associated with FSS space stations.
- 18) Update and improve definitions.

#### **B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA**

No party filing comments in this proceeding responded to the IRFA, and no party filing comments in this proceeding otherwise argued that the policies and rules proposed in this proceeding would have a significant economic impact on a substantial number of small entities. The Commission has, nonetheless, considered any potential significant economic impact that the rule changes may have on the small entities which are impacted. On balance, the Commission believes that the economic impact on small entities will be positive rather than negative, and that the rule changes move to streamline the Part 25 requirements.

#### **C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration**

Pursuant to the Small Business Jobs Act of 2010, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration, and to provide a detailed statement of any change made to the proposed rules as a result of those comments. The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

#### **D. Description and Estimate of the Number of Small Entities to Which the Rules May Apply**

The RFA directs agencies to provide a description of, and, where feasible, an estimate of, the number of small entities that may be affected by the rules adopted herein.<sup>5</sup> The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and

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<sup>5</sup> 5 U.S.C. § 604(a)(3).

“small governmental jurisdiction.”<sup>6</sup> In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.<sup>7</sup> A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).<sup>8</sup> Below, we describe and estimate the number of small entity licensees that may be affected by the adopted rules.

### *Satellite Telecommunications and All Other Telecommunications*

The rules adopted in this Order will affect some providers of satellite telecommunications services. Satellite telecommunications service providers include satellite and earth station operators. Since 2007, the SBA has recognized two census categories for satellite telecommunications firms: “Satellite Telecommunications” and “Other Telecommunications.” Under the “Satellite Telecommunications” category, a business is considered small if it had \$32.5 million or less in annual receipts.<sup>9</sup> Under the “Other Telecommunications” category, a business is considered small if it had \$32.5 million or less in annual receipts.<sup>10</sup>

The first category of Satellite Telecommunications “comprises establishments primarily engaged in providing point-to-point telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.”<sup>11</sup> For this category, Census Bureau data for 2007 show that there were a total of 512 satellite communications firms that operated for the entire year.<sup>12</sup> Of this total, 482 firms had annual receipts of under \$25 million.<sup>13</sup>

The second category of Other Telecommunications is comprised of entities “primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.”<sup>14</sup> For this category, Census Bureau data for 2007 show that there were a total of 2,383 firms that operated for the entire year.<sup>15</sup> Of

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<sup>6</sup> 5 U.S.C. § 601(6).

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

<sup>8</sup> Small Business Act, 15 U.S.C. § 632 (1996).

<sup>9</sup> See 13 C.F.R. § 121.201, NAICS code 517410.

<sup>10</sup> See 13 C.F.R. § 121.201, NAICS code 517919.

<sup>11</sup> U.S. Census Bureau, 2007 NAICS Definitions, “517410 Satellite Telecommunications.”

<sup>12</sup> See [http://factfinder.census.gov/servlet/IBQTable?\\_bm=y&-geo\\_id=&-skip=900&-ds\\_name=EC0751SSSZ4&-lang=en](http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-skip=900&-ds_name=EC0751SSSZ4&-lang=en).

<sup>13</sup> *Id.*

<sup>14</sup> U.S. Census Bureau, 2007 NAICS Definitions, “517919 Other Telecommunications,” <http://www.census.gov/naics/2007/def/ND517919.HTM>.

<sup>15</sup> See 13 C.F.R. § 121.201, NAICS code 517919.



this total, 2,346 firms had annual receipts of under \$25 million.<sup>16</sup> We anticipate that some of these “Other Telecommunications firms,” which are small entities, are earth station applicants/licensees that will be affected by our adopted rule changes.

We anticipate that our rule changes will have an impact on earth and space station applicants and licensees. Space station applicants and licensees, however, rarely qualify under the definition of a small entity. Generally, space stations cost hundreds of millions of dollars to construct, launch and operate. Consequently, we do not anticipate that any space station operators are small entities that would be affected by our actions.

#### **E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities**

The Order adopts a number of rule changes that will affect reporting, recordkeeping and other compliance requirements for earth and space station operators. Most changes, as described below, will decrease the burden for all businesses operators, especially firms that hold licenses to operate earth stations.

We streamline and reorganize the rules to facilitate improved compliance. First, the Order simplifies information collections in applications for earth station licenses, and increases the number of earth station applications eligible for routine processing. Specifically, the Order eliminates reporting requirements that are more burdensome than necessary. For example, because it may be more convenient for some applicants to qualify for routine licensing based on certification of conformance with off-axis gain and input power density criteria than to submit data to demonstrate compliance with routine off-axis EIRP density limits, we incorporate alternative off-axis gain and input power density criteria in the rules for applicants for earth stations transmitting to geostationary satellites in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands. Thus, an applicant for such earth stations can qualify for routine licensing either by demonstrating that it will meet the off-axis EIRP density criteria or by certifying conformance with off-axis gain standards and specifying input power density consistent with the proposed criteria.

Another example is that we see no reason to require earth station antenna gain to be measured in all directions. We, therefore, delete language that may ambiguously imply requirements beyond the intended rules. Additionally, we amend a provision to require gain to be measured at the bottom and top of each band assigned for uplink transmission, but eliminate the required measurement at the middle of the allocated frequency band. The Order also expands routine licensing eligibility to include “extended C-band” earth stations.

We amend the rules to allow earth station operators to slightly repoint their antennas without prior approval for communication with a GSO replacement satellite within  $\pm 0.15^\circ$  of the originally authorized location. We also eliminate the need to license receive-only earth stations communicating with non-U.S. licensed space stations approved for U.S. market access. We clarify that provisions to qualify for routine licensing for earth station applicants proposing to transmit in the conventional C-band, the conventional Ku-band, or the 24.75-25.25 GHz band also apply to earth stations that use allocated FSS frequencies to provide feeder links for non-FSS space stations, *e.g.*, feeder links for Mobile-Satellite Service (MSS) or BSS space stations.

The Order also changes filing requirements. For example, we remove the requirement on applicants for earth station operation in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30.0 GHz bands to submit antenna gain plots for the receive bands. We also delete requirements for portable earth station transceivers to demonstrate compliance with certain rule sections.

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<sup>16</sup> U.S. Census Bureau, 2007 Economic Census, Subject Series: Information, Table 5, “Establishment and Firm Size: Employment Size of Firms for the United States: 2007 NAICS Code 517919” (issued Nov. 2010).

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

The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rules for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities.”<sup>17</sup>

The Commission is aware that some of the revisions may impact small entities. The *Further Notice* sought comment from all interested parties, and small entities were encouraged to bring to the Commission’s attention any specific concerns they may have with the proposals outlined in the *Further Notice*. No commenters raised any specific concerns about the impact of the revisions on small entities. This order adopts rule revisions to modernize the rules and advance the satellite industry. The revisions eliminate unnecessary requirements and expand routine processing to applications in additional frequency bands, among other changes. Together, the revisions in this Order lessen the burden of compliance on small entities with more limited resources than larger entities.

The adopted changes for earth station licensing clarify requirements for routine licensing and expand applicability of routine licensing standards. Each of these changes will lessen the burden in the licensing process. Specifically, this Order adopts revisions to provide alternatives for filing requirements, reduce filing requirements and clarify antenna pattern measurement requirements in such a way that applicant burden will be reduced. Thus, the revisions will ultimately lead to benefits for small earth station operators in the long-term.

**G. Report to Congress**

The Commission will send a copy of this Second Report and Order, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.<sup>18</sup> In addition, the Commission will send a copy of this Order, including this FRFA, to the Chief Counsel for Advocacy of the SBA. A copy of this Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register.<sup>19</sup>

**H. Legal Basis**

The action is authorized under Sections 4(i), 7(a), 303(c), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 157(a), 161, 303(c), 303(f), 303(g), and 303(r).

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<sup>17</sup> 5 U.S.C. § 603(c)(1)-(c)(4).

<sup>18</sup> See 5 U.S.C. § 801(a)(1)(A).

<sup>19</sup> See 5 U.S.C. § 604(b).

**STATEMENT OF  
CHAIRMAN TOM WHEELER**

Re: *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267

Today, we celebrate the arrival of a much anticipated space-based sequel: the Part 25 Second Report and Order. This item is not just the follow-up to our 2013 rules reforming satellite licensing, it is the latest – and arguably the most epic – episode in the Commission’s ongoing process reform journey.

The U.S. satellite industry generates more than \$87 billion in annual revenue and delivers a wide variety of consumer services including satellite TV, radio, and broadband. In this order, we adopt significant reforms to our rules governing satellite licensing and operations, known as Part 25, to make the regulatory approval process for satellite licenses easier and more efficient, to provide more operational flexibility, and to dramatically reduce regulatory burdens and costs.

We conclude that many of these rule provisions are unnecessary, outdated or redundant. We are eliminating over 50 rule provisions, which will enable parties to save time, effort, and expense in preparing license applications and complying with license terms. For example, eliminating the submission of interim milestone requirements and eliminating the two-degree spacing showings will substantially reduce administrative burdens on satellite licensees and Commission staff.

The Order also streamlines, clarifies or updates over 200 other rule provisions and definitions. The end result will be faster processing times for satellite space and earth station applications. That means faster deployment of innovative services to consumers.

For instance, streamlining our process to allow for the early submission of coordination information to the International Telecommunication Union will better facilitate international coordination and place U.S. space station licensees on equal footing with other countries that do not require submission of detailed technical system parameters before filing submissions to the ITU. Expanding options for routine earth station licensing will also lead to quicker service to consumers.

This proceeding is one of the most comprehensive under my process reform initiative. The rule changes will enable parties to save time, effort, and expense in preparing license applications. Most important, we hope that these and other process reforms will facilitate new innovations and the delivery of better products and services to the American people.

Thank you to the Commission staff for their work on this item. We also appreciate the time, attention and useful recommendations submitted in this proceeding by many stakeholders and, in particular, by the Satellite Industry Association.

**STATEMENT OF  
COMMISSIONER MIGNON L. CLYBURN**

Re: *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267

The commercial satellite industry is a sector that provides important voice, data, and entertainment services and is a driver of significant economic growth. During large scale natural disasters, these networks play a major role in ensuring continuity of communications when wireline and wireless networks are damaged. From Hurricane Katrina in 2005, to the 2010 earthquake in Haiti, to the devastating Texas wildfires and the Japanese tsunami in 2011, to Super Storm Sandy in 2012 in the northeast and the 7.8 magnitude earthquake in Nepal in April this year, geostationary satellite operators, or GSOs, provided services that kept emergency responders, businesses and people connected when they needed it the most. GSOs also deliver TV and radio service to millions of consumers and provide competition to incumbent media providers. I might note that innovative non-geostationary satellite operators, or non-GSOs, plan to offer fixed satellite services, which promise to soon connect low income communities around the globe to the Internet. This \$190 billion global industry employs more than 200,000 Americans and one of the best ways to encourage more innovation in this space is to remove outdated rules and unnecessary barriers to investment.

Today's Order streamlines or updates more than 200 rule provisions. We are giving GSOs the option to seek a faster way to register for International Telecommunications Union (ITU) recognition, which is a "must" for a successful satellite network operation. Under our current rules, the International Bureau may not even begin the ITU registration process for a company until it submits a detailed application for the frequency band and orbital location of a proposed space station. The U.S. is the only administration in the world that imposes such a restriction. Because of this, our satellite companies find themselves at a competitive disadvantage and foreign operators are able to secure ITU priority over American licensed companies. The process we adopt today eliminates that unfavorable distinction. Additionally, we are revising the two-degree spacing requirements to better accommodate the use of small antennas and facilitate individualized coordination agreements between satellite companies. We are eliminating all of the space station construction milestones except for the requirement to bring them into operation at the assigned locations within a specified period of time. We are also simplifying routine earth station licensing. With this Order, the Commission is continuing its comprehensive approach to revising its Part 25 rules so that they keep pace with technological developments and spur greater investment in the commercial satellite industry.

I wish to thank Clay DeCell for his excellent presentation, as well as Jose Albuquerque, Troy Tanner, Jennifer Gilson, Diane Garfield, Steve Duall, Chip Fleming, and Kerry Murray for their work on this item. Diane Cornell and Mindel De La Torre should also be commended for their leadership in this proceeding.

**STATEMENT OF  
COMMISSIONER JESSICA ROSENWORCEL**

Re: *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267

We are on a streamlining streak. The year before last the Commission simplified and revised over 150 of its Part 25 rule provisions governing satellite services. Then last year we proposed further updates to our satellite policies—and today we put even more streamlined procedures in place.

For starters, we eliminate interim milestone implementation requirements. We update our two-degree spacing policy. We also pare down and revise the application process for reserving space in the international licensing queue.

Every one of these streamlining efforts matters. They can increase investment and they can speed the deployment of satellite services—services that are responsible for vital communications worldwide.

So kudos to the International Bureau for continuing to modernize and rationalize our rules. But no rest for the weary. Because we will need to monitor our revised application process to ensure that it balances the timely deployment of strategic assets with the need to prevent anti-competitive warehousing. In addition, we commit to a future rulemaking on our new two-degree spacing approach in order to assess its impact. So thank you to our experts on Part 25 for your streamlining efforts to date and for the work that lies ahead.

**STATEMENT OF  
COMMISSIONER AJIT PAI**

Re: *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267

Seventy years ago, author Arthur C. Clarke popularized the idea of sending rocket stations up into geostationary orbit to bring radio coverage to the whole world. Just 19 years later in 1964, NASA launched the first such “rocket station” from Cape Canaveral and positioned it 22,236 miles above the Earth’s equator near the International Date Line. That satellite, Syncom-3, was the world’s first satellite in geostationary orbit. It did what few thought possible in the 1960s—beam the Summer Olympics from Tokyo back to the United States. And it’s still around, drifting over the Atlantic Ocean.<sup>1</sup>

Something else that dates back to the 1960s has also been drifting around: the FCC’s Part 25 rules governing satellite licensing and operations. When we commenced this proceeding three years ago, I hoped that we would comprehensively rewrite and update those rules to make the United States the most desirable country in the world for licensing and operating satellites.<sup>2</sup> We’re now taking action, and greater innovation in orbit is likely to be the result.

There are many changes to be excited about, like new off-axis EIRP density envelopes and expanded routine emission levels for sidelobes in the plane tangent to the GSO arc. But two changes are particularly important to me.

*First*, I have long called on the Commission to substantially reduce the burden of our milestone review process.<sup>3</sup> Under that process, satellite companies have to submit to cumbersome regulatory review of their business and technical plans and meet certain construction milestones after being granted a license. I was pleased last year when the *Further Notice* included my proposal to “make all interim milestones optional” and adopt escalating bonds in their stead.<sup>4</sup> And I’m delighted that today, we go one step further and eliminate interim milestones entirely.<sup>5</sup> This decision to replace bureaucratic micromanagement with economic incentives will simplify the application process for satellite operators and reduce the burden of oversight on Commission staff, to the benefit of consumers and taxpayers alike.

*Second*, I suggested last year that we streamline the licensing of small earth stations. As proposed by the Satellite Industry Association, this would allow a licensee to “increase the number of earth stations operating under a blanket license without prior authorization.”<sup>6</sup> The *Order* does just that, ending the need for operators to seek the government’s permission before serving new customers with an existing service.<sup>7</sup>

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<sup>1</sup> Infosatellites.com, Satellite Tracking, Prediction and Informations about Objects in the Sky: Syncom-3, <http://www.infosatellites.com/syncom3-satellite-tracking-norad-858.html>.

<sup>2</sup> *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Notice of Proposed Rulemaking, 27 FCC Rcd 11619, 11709 (2012) (Statement of Commissioner Ajit Pai).

<sup>3</sup> *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, Report and Order, 28 FCC Rcd 12403, 12515–16 (2013) (Statement of Commissioner Ajit Pai) (expressing “hope the *Further Notice* will consider . . . Boeing’s recommendation to reduce the burden of our milestone review process”).

<sup>4</sup> *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, *Further Notice of Proposed Rulemaking*, 29 FCC Rcd 12116, 12130, para. 34 (2014) (*Further Notice*).

<sup>5</sup> See *Order* at paras. 49–90.

<sup>6</sup> *Further Notice*, 29 FCC Rcd 12159, para. 149; see also *id.* at 12238 (Statement of Commissioner Ajit Pai).

<sup>7</sup> See *Order* at para. 291.



Credit for these achievements goes to the Commission's dedicated staff. I extend my gratitude to José Albuquerque, Clay DeCell, Steve Duall, Jerry Duvall, Chip Fleming, Diane Garfield, Jennifer Gilsenan, Kerry Murray, Steve Spaeth, and Troy Tanner. Thank you for your continued dedication and service to the American public on the ground and out in space.

**STATEMENT OF  
COMMISSIONER MICHAEL O'RIELLY**

Re: *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267

I commend the Chairman and the International Bureau for taking the necessary steps to update and streamline the Commission's satellite rules. Fifteen years is far too long to wait for a comprehensive review and update of any Commission regulation. Such an undertaking should occur on a regular basis to ensure that our rules remain current and consistent with industry trends.

Generally, I support today's action that should modernize our rules, reduce burdens on industry and more closely align the Commission's processes with those of other administrations. Hopefully, these changes will increase the likelihood that, going forward, U.S. companies will have greater incentives to approach the Commission to acquire satellite allotments from the International Telecommunication Union.

Of course, sound satellite policy also calls for the requisite counterbalance. Facilitating the licensing process must not result in a multitude of filings that will never be pursued, creating spectrum inefficiencies. Today's item seems to strike an appropriate equilibrium. At the same time, I am concerned whether the application surety bond is the correct approach to prevent warehousing. Other countries' administrations do not require such a bond and industry participants generally oppose it. Not to mention that sufficient justification for such a bond seems lacking in the record.

Besides streamlining our filing and process requirements, this order retains the two-degree spacing policy with a few changes and modifies many other highly technical rules. Two-degree spacing was the main focus of ex parte meetings with various interested parties. Unfortunately, as in so many other proceedings, it once again became readily apparent that stakeholders had varying levels of knowledge about what was actually contained in the draft. Some entities seemed to have an impressively thorough understanding, several had received conflicting information, and others had none at all. What an amazing waste of time and effort. This is a perfect example of why the public should have had access to this draft and every other at the time that they are circulated to the Commissioners. Not only does fairness demand that all should be on the same playing field, but such transparency would have promoted further industry input, which would have been helpful to ensure that the many technical requirements and procedures set forth in this item work collectively. I do not intend to let this issue go when we have a simple and obvious solution right in front of us.

It is my understanding that, while working on this proceeding, staff has determined there are other rules and processes that should be reviewed or need further thought. They have informed me that additional notices and guidelines will be forthcoming shortly. This will provide us with an opportunity to further streamline our rules and procedures and consider any other necessary modifications. I thank the International Bureau for their hard work on this voluminous order and their efforts to come.