**Before the**
**Federal Communications Commission**
**Washington, DC 20554**

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

## REPLY COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association ("SIA") submits these Reply Comments in response to the Further Notice of Proposed Rulemaking ("FNPRM") in the above captioned proceeding in which the Commission proposes to further modernize the rules governing satellite services.[1] SIA reiterates its support for the Commission's efforts to update its licensing and operating rules for satellite earth stations and space stations.

In its Comments, SIA supported many of the Commission's proposed modifications to the technical rules governing satellite earth stations, while also proposing further changes and various clarifications to better harmonize and modernize these technical rules.[2] After reviewing the comments filed by other parties and re-examining its own proposals, SIA proposes in these Reply Comments further refinements to the modifications proposed in its Comments.

SIA supports Kymeta's proposal to flatten the "wings" of the off-axis EIRP density mask set forth in Section 25.138 (for the conventional Ka-band),[3] and proposes similar changes to the off-axis EIRP density masks set forth in various rule sections for the conventional Ku-band. SIA is also considering harmonized changes to the off-axis EIRP density masks set forth elsewhere in

[1] *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Further Notice of Proposed Rulemaking, IB Docket No. 12-267, FCC 14-142 (rel. Sept. 30, 2014). Initial comments were filed on January 29, 2015.
[2] Comments of SIA, filed Jan. 29, 2015.
[3] Comments of Kymeta Corporation, filed Jan. 29, 2015, at 7 – 8.

the Part 25 technical rules, as well as to the underlying earth station antenna mask in Section 25.209, but has not yet completed its analysis of such an approach. The current mask is not technology neutral, and it imposes unnecessary obstacles to the routine licensing of Geostationary Satellite Orbit (GSO) fixed-satellite service (FSS) earth stations operating on a primary basis. SIA has calculated that the proposed change to the mask will not present a materially greater risk of harmful interference.

SIA opposes the Commission's proposal to establish a minimum earth station antenna diameter requirement for the routine processing of Ka-band GSO FSS earth station antennas operating on a primary basis.[4] SIA further proposes harmonized changes to eliminate the minimum earth station antenna diameter requirements for Ku-band GSO FSS earth station antennas. If minimum earth station antenna diameter requirements remain, SIA urges the Commission to specify that these requirements do not apply to GSO FSS earth stations operating on a primary basis that automatically track the target GSO FSS satellite, as long as these antennas have appropriate pointing error and shut-off mechanisms such as those provided in Section 25.227(a)(1)(ii) and (iii) of the Commission's rules.

SIA proposes several modifications related to Non-Geostationary Satellite Orbit ("NGSO") FSS operations in order to clarify certain defined terms. Finally, SIA urges the Commission not to create policies or rules specific to "small satellites" in this proceeding, but instead to initiate a separate rulemaking to do so. The record is currently insufficient to determine what, if any, rule adjustments regarding small satellites would be needed to ensure that all satellite operators can make use of orbital resources effectively and responsibly.

[4] FNPRM at ¶ 81.

## I. FURTHER MODIFICATIONS OF THE EARTH STATION LICENSING RULES ARE REQUIRED TO ENSURE APPROPRIATE MODERNIZATION

### A. SIA Supports Kymeta's Proposal to Flatten the "Wings" of the Off-Axis EIRP Density Masks

In its Comments, Kymeta proposed a technology neutral mask for Ka-band GSO FSS transmit earth stations.[5] Kymeta noted that the current mask imposes unnecessary obstacles to the routine licensing of earth stations.[6] Specifically, Kymeta proposed to remove the "wings" for off-axis EIRP density emissions, thus "flattening" the mask for the off-axis range from 19.1° - 180°.[7]

SIA fully supports Kymeta's proposal to adopt a technology neutral mask for Section 25.138 (conventional Ka-band earth stations) that eliminates the "wings" for the off-axis range from 19.1° - 180°. SIA agrees with Kymeta that "the shape of the off-axis EIRP density mask codified in Section 25.138(a) appears to trace the natural shape of the radiated pattern produced by a parabolic antenna."[8] In Exhibit 2 to its Comments, Kymeta calculated – in a near-worst-case analysis – that this change to the Ka-band GSO FSS earth station off-axis EIRP density mask would result in an increase of only 0.15 dB to a victim satellite's noise floor.[9] SIA undertook its own examination and obtained nearly identical results, determining that the proposed change to the mask would result in an increase of up to 0.16 dB. *See* Exhibit 1. Further, as Kymeta notes, a calculation based on a more likely set of assumptions would result in even less interference.[10] In light of the desire to facilitate introduction of new antenna

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[5] Comments of Kymeta Corporation, at pp. 1 – 2, and 7 – 8.
[6] Id. at 1.
[7] Id. at 8.
[8] Id.
[9] Kymeta Comments, Exhibit 2, at 4.
[10] For example, the calculations assume that earth stations are co-located and transmitting to a satellite in all available orbital slots at 2° and that each earth station is operating at the limit of the mask. A more realistic assumption would be that only half of the orbital slots are receiving an interfering carrier, and

technologies and these interference assessments, it is appropriate to remove the "wings" that begin at 19.1° and abruptly end at 48°.

The modern satellite fleets deployed by SIA's members would not be negatively impacted by the proposed change. At the same time, the change will enable routine processing – and more rapid deployment – of a wider range of state-of-the-art earth station terminals, to the benefit of satellite service customers. Exhibit 2 is a modified version of SIA's proposed revisions to Sections 25.138 (a)(1), (a)(2), (a)(4) and(a)(5) to reflect the modifications proposed by SIA in these Reply Comments.[11]

SIA further proposes to apply this technology neutral mask to the conventional Ku band off-axis EIRP density masks contained in various rule sections. Eliminating the "wings" from the off-axis EIRP density masks that apply to fixed satellite conventional Ku-band earth station antennas including ESV's, ESAA's and VMES, in addition to Ka-band FSS earth station antennas, will be an important step toward harmonized and technology neutral rules for primary FSS satellite user terminals and will accelerate licensing and deployment of a wider range of earth stations. These changes can be made without presenting a materially greater risk of harmful interference. Therefore, SIA supports conforming changes to the conventional Ku-band and conventional Ka-band portions of Sections 25.218, 25.222, 25.226 and 25.227. *See* Exhibit 3 (red-line changes to the matrix initially attached to SIA's Comments as Annex B).[12]

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that interfering earth stations have, on average, a 3 dB margin relative to the mask. Using these more realistic assumptions, Kymeta calculated an increase of only 0.07 dB to a victim satellite's noise floor. *See* Kymeta Comments, Exhibit 2, at 4.

[11] The changes to SIA proposals for Sections 25.138(a)(4) and (a)(5) correct inadvertent and typographical errors.

[12] SIA is also correcting several items in the matrix it submitted as Annex B to its Comments. First, SIA is reinserting the last row of the table in its proposal for Section 25.218(f)(1) which covers the angular range from 85° to 180°. In the provisions regarding off-axis EIRP density cross polarization, there was inadvertent inclusion of "plane orthogonal to the local plane of the GSO arc" in Sections 25.138(a)(4)(i) and 25.221(a)(1)(i)(C). Certain tables were truncated in the SIA proposal column when the matrix was

SIA does not support Kymeta's proposal to impose a limit of -10 dBW/MHz EIRP on the average power spectral density ("PSD") of co-polarized signals emitted by any earth station from 19.1° - 180°.[13] Imposing a maximum average PSD is not necessary to avoid harmful interference. As noted previously, there would be a negligible increase to the noise floor of neighboring satellites in the range of 19.1° - 180° if the "wings" are removed from the GSO FSS earth station off-axis EIRP density masks. Limiting average PSD is unnecessary, and would undo the very benefits of removing the "wings".[14]

### B. SIA Proposes to Eliminate the Minimum GSO FSS Earth Station Antenna Diameter Requirements

SIA opposes the Commission's proposal to establish a minimum antenna diameter requirement for the routine processing of Ka-band GSO FSS earth station antennas in Sections 25.134(c)(1)(i) and 25.212(g)(1).[15] SIA further proposes harmonized changes to eliminate the minimum antenna diameter requirements for Ku-band GSO FSS earth station antennas, as currently specified in Sections 25.134(g)(1)[16] (25.134(a)(1)(i) in the Commission's proposed rules) and Section 25.212(c)(1) (same section in the Commission's proposed rules). *See* Exhibit 3 (red-line changes to the relevant portions of the matrix attached to SIA's Comments as Annex B).

SIA submits that mandating a minimum GSO FSS earth station antenna diameter for routine processing is unnecessary and entirely contrary to the principle of technology neutrality.

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converted to a PDF document. Exhibit 3 to these Reply Comments is a revised matrix, reflecting these corrections in addition to the modifications proposed in these Reply Comments.

[13] Kymeta Comments at 8.

[14] Kymeta is a member of SIA, and it has advised SIA that it has no objection to deleting this aspect of its proposal.

[15] FNPRM at ¶ 81.

[16] SIA's Comments proposed deletion of the VSAT rules in 25.134 including 25.134(b)(1)(i) and (c)(1)(i). These rules are duplicative of the earth station blanket licensing provisions in other rule sections, *e.g.* 25.212.

The Commission's rules already require that strict technical criteria be met for an earth station to be licensed. GSO FSS earth station terminal performance (including antenna performance, off-axis EIRP density, RF power level and signal bandwidth), regardless of size, should be the only relevant criteria for licensing.

Advances in technology, particularly for Ku-band and Ka-band equipment, enable vendors to produce ever smaller antennas that comply with the relevant GSO FSS earth station antenna performance and off-axis EIRP density requirements. By continuing to impose minimum antenna size requirements (let alone imposing such requirements on Ka-band GSO FSS earth station antennas for the first time) the Commission will put state-of-the-art technologies at a regulatory disadvantage, to the harm of the satellite industry and its customers. To the extent that minimum GSO FSS earth station antenna size reduces the harmful impact of mis-pointing, satellite operators are confident, based on extensive experience, that coordination among satellite operators, instead of regulatory mandates will adequately address this problem for antennas of all sizes.

If minimum GSO FSS earth station antenna diameter requirements remain, SIA urges the Commission to specify that these requirements do not apply to earth stations that automatically track the target GSO FSS satellite, as long as these antennas have appropriate pointing error and shut-off mechanisms such as those provided in Section 25.227(a)(1)(ii) and (iii) of the Commission's rules. To the extent that minimum GSO FSS earth station antenna size is intended to reduce the harmful impact of mis-pointing, it makes no sense whatsoever to apply this requirement to technologically advanced earth station antennas that automatically self-correct any pointing errors.

## II. MODIFICATIONS RELATED TO NGSO FSS OPERATIONS ARE NEEDED TO CLARIFY CERTAIN DEFINED TERMS

### A. SIA Proposes a New Definition for "Conventional NGSO FSS Ka Bands."

SIA proposes a definition be added to Section 25.103 of the rules for "Conventional NGSO FSS Ka bands." This definition would be a counterpart to the definition SIA has proposed for Conventional GSO Ka Bands, which covers the Ka-band frequencies on which GSO FSS stations are primary in the United States.[17] The new definition would cover the Ka-band frequencies on which NGSO FSS stations are primary in the United States, and would read as follows: "The 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) frequency bands, which the Commission has designated as primary for NGSO FSS operation."

### B. SIA Proposes Changes to the Definition of "NGSO FSS Gateway Earth Station."

In addition to the changes to the definition of "NGSO FSS gateway earth station" in Section 25.103 that the Commission already has proposed in the FNPRM,[18] SIA proposes the following changes:

> An earth station or complex of multiple earth station antennas supporting the routing and switching functions of an NGSO FSS system. An NGSO FSS gateway earth station does not originate or terminate communication 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, communicating with the user-operated earth stations~~ via links with NGSO satellites. 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.

The modified definition is supported by a number of factors. Given the evolving nature of NGSO FSS services, the current definition, as proposed to be modified in the FNPRM, does

[17] *See* Comments of SIA, filed Jan. 29, 2015, at 29.
[18] *See* FNPRM at ¶ 124.

not take into account how the operation of gateway earth stations has evolved. For example, the "operating in other frequency bands" language is not factually accurate for O3b's system. O3b's primary gateway earth stations in the U.S. (in Hawaii and Texas) use the same frequencies as O3b's non-gateway earth stations around the world.

The current definition is also outdated with regard to infrastructure options. Gateway earth stations today are used to connect traffic both for public and private use, so mention of only "primary terrestrial networks, such as the public switched telephone network and Internet networks" does not reflect the current operations of all NGSO FSS systems. O3b's system provides connectivity to the public Internet and to private networks, and also supports mobile backhaul, using its gateway earth stations.

Additionally, there are various business models for operating earth station networks, and "user-operated" is unnecessarily limited to one possible type of business arrangement. It is not clear whether "user" refers to the satellite operator or to the customer of a satellite operator – either may be the case. If "user" is intended to refer to only one of these, it is incomplete and unnecessarily restrictive.

For these reasons, the proposed changes should be incorporated into the definition of NGSO FSS gateway earth stations.

### C. SIA Proposes to Modify Section 25.115(e) Regarding Operation of NGSO FSS Earth Stations in the "Conventional NGSO FSS Ka Bands."

SIA proposes to modify Section 25.115(e) to state that an applicant may request authority for operation of NGSO FSS earth stations in the "conventional NGSO FSS Ka bands" (defined as proposed by SIA in these reply comments) without specifying the location of user terminals but must specify 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. This proposal parallels the SIA proposal for GSO FSS earth stations in Section 25.115(e).

## III. THE COMMISSION SHOULD INITIATE A SEPARATE PROCEEDING TO ADDRESS THE REGULATORY ISSUES PRESENTED BY SMALL SATELLITES

SIA urges the Commission not to create policies or rules specific to "small satellites" in this proceeding, but instead to initiate a separate rulemaking to do so. Two commenters urge the FCC to consider the effect of the Part 25 regulations upon nanosatellite systems,[19] but do not provide specific suggestions for rule language. As a result, the Commission lacks an adequate record to make findings regarding what, if any, rule adjustments to accommodate small satellites would serve the public interest. Therefore, SIA continues to urge the Commission to initiate a separate proceeding to address small satellite issues.

## IV. CONCLUSION

For the reasons discussed herein, SIA recommends that the Commission remove the "wings" from the off-axis EIRP density masks applied to conventional Ku-band and conventional Ka-band primary GSO FSS earth station antennas. Further, SIA recommends that the Commission not adopt a minimum GSO FSS earth station antenna diameter for the routine licensing of primary Ka-band earth stations, and that the Commission eliminate such a requirement for the routine licensing of primary Ku-band GSO FSS earth stations.

[19] *See* Comments of Planet Labs Inc., filed Jan. 29, 2015, at 1; Comments of Spire Global Inc., filed Jan. 29, 2015, at 1.

SIA recommends that the Commission adopt several modifications related to NGSO FSS operations in order to clarify certain defined terms. Finally, SIA urges the Commission to initiate a separate rulemaking proceeding to consider policies or rules specific to "small satellites."

Respectfully submitted,

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March 2, 2015

**EXHIBIT 1: TECHNICAL SHOWING**

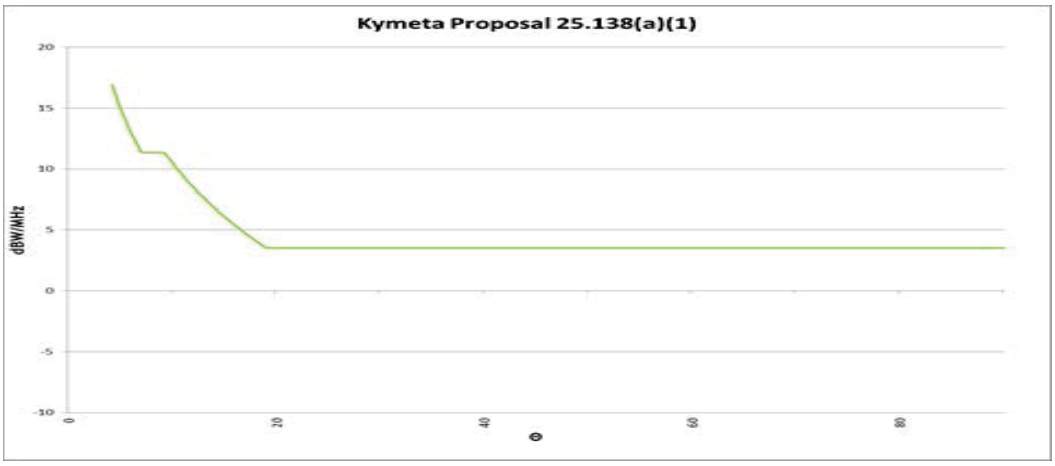
**Impact of the Kymeta Proposed Changes to Section 25.138**

The following analysis considers the impact of the proposal made by Kymeta in regards to the GSO FSS off-axis antenna gain mask in Ka-band.

**Assumptions:**

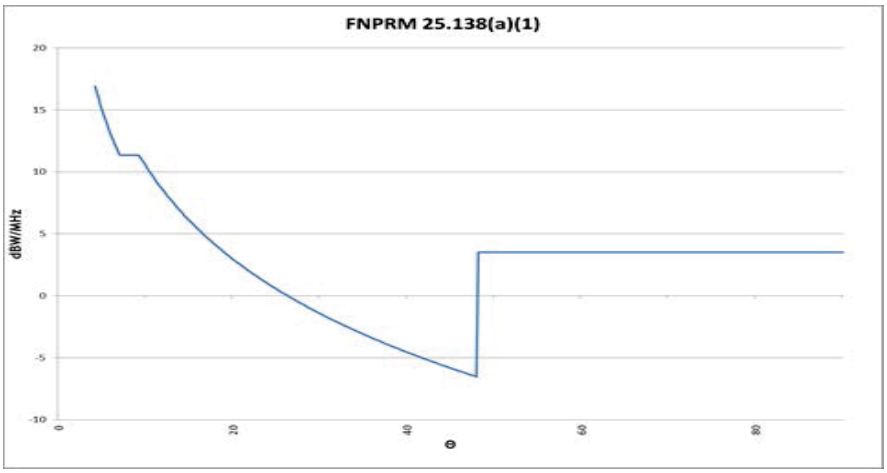
a. It is assumed that the GSO FSS off axis EIRP density proposed by Kymeta is as follows:

| Angle from the axis of the earth station antenna mainlobe | Off axis EIRP density (dBW/MHz) |
|---|---|
| $2° \leq \theta \leq 7°$ | $32.5 - 25 \log \theta$ |
| $7° < \theta \leq 9.23°$ | 11.35 |
| $9.23° < \theta \leq 19.1°$ | $35.5 - 25 \log \theta$ |
| $19.1° < \theta \leq 180°$ | 3.5 |



b. It is assumed that the current off axis EIRP density mask in 25.138(a)(1) of the Commission's Rules is provided in the table below:

| Angle from the axis of the earth station antenna mainlobe | Off axis EIRP density (dBW/MHz) |
|---|---|
| $2° \leq \theta \leq 7°$ | $32.5 - 25 \log \theta$ |
| $7° < \theta \leq 9.23°$ | 11.35 |
| $9.23° < \theta \leq 48°$ | $35.5 - 25 \log \theta$ |
| $48° < \theta \leq 180°$ | 3.5 |




c. It is assumed that the victim is a GSO FSS satellite.

d. It is assumed that interferers are a collection of co-located GSO FSS earth stations. Each interfering earth station transmits at the off-axis power level defined by the masks above. Each of the interfering earth station points to a different GSO FSS satellite. The target GSO FSS satellites are located at two degree increments around the GSO arc. (*i.e.* 2, 4, 6, 8, ….).

e. The wanted carrier comes from an earth station co-located with the interfering earth stations.

**Analysis**

a. Calculating the aggregate C/I can be found using the following equation:

$$\frac{C}{I}(dB) = C(dB) - 10 * \log\left[2 * \sum_{i=1}^{90}[OAED_i]\right]$$

Where **i** is an index relating to the *ith* interfering earth station, transmitting with an off-axis e.i.r.p. density$_I$ (OAED$_I$) towards the victim satellite per the applicable 25.138 or Kymeta modified off-axis e.i.r.p. mask. Note that the sum is only performed from i=1 to 80 as a maximum of approximately 160$^o$ of the geostationary orbit can be seen from any location on Earth.

b. Calculating the difference in C/I between the two antennas can be found as follows:

$$Difference = \frac{C/I_{Kymeta}}{C/I_{25.138}}$$

Since the wanted carrier power "C" is the same in both cases:

$$= \frac{I_{Kymeta}}{I_{25.138}}$$

or:

$$= I_{Kymeta} - I_{25.138} \quad (dB)$$

substituting from (a) above:

$$= \left[10 * \log\left[2 * \sum_{i=1}^{90}[OAED_i]\right]\right]_{Kymeta} - \left[10 * \log\left[2 * \sum_{i=1}^{90}[OAED_i]\right]\right]_{25.138}$$

Performing the sum results in a difference in an aggregate interference power to the victim satellite of 0.2 dB.

In other words, for a GSO FSS earth station transmitting with the more permissive mask of the Kymeta proposal, the C/I could increase by a maximum of 0.2 dB under the assumptions stated above.

**EXHIBIT 2**

**Proposed Changes to Section 25.138 of the FCC's Rules**

*SIA's proposed changes to Section 25.138 (a)(1), (a)(2), (a)(4) and (a)(5) are based on Annex B to SIA's Comments, as further revised by Annex B to SIA's Reply Comments, filed in response to the proposed rules set forth in the Further Notice of Proposed Rulemaking in IB Docket No. 12-267, FCC 14-142, rel. Sept. 30, 2014.*

§ 25.138 Licensing requirements for conventional GSO Ka-band FSS Earth Stations .

(a) Applications for earth station licenses in the conventional GSO Ka-band FSS 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 spectral density of co-polarized signals in the local plane of the GSO arc, as defined in § 25.103, will not exceed the following values under clear sky conditions:

| | | |
|---|---|---|
| 32.5-25log(θ) | dBW/MHz | for 2.0° ≤θ ≤7° |
| 11.35 | dBW/MHz | for 7° ≤θ ≤ 9.23° |
| 35.5-25log(θ) | dBW/MHz | for 9.23° ≤θ ≤ 19.1° |
| 3.5 | dBW/MHz | for 19.1° <θ ≤ 180° |

where θ is the angle in degrees from a line from the axis of the main lobe measured in the local plane of the GSO arc.

(2) In the plane orthogonal to the local plane of 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(θ) | dBW/MHz | for 3.5° ≤θ ≤ 7° |
| 14.35 | dBW/MHz | for 7° <θ ≤ 9.23° |
| 38.5-25log(θ) | dBW/MHz | for 9.23° <θ ≤ 19.1° |
| 6.5 | dBW/MHz | for 19.1° <θ ≤ 180° |

where θ is as defined in paragraph (a)(1) of this section.

(3) The off-axis EIRP density mask in sections (a)(1) and(2) above, may be exceeded to the same extent allowed for the off-axis gain mask in §§ 25.209(a)(3) and (4), respectively.

(4) The EIRP density of cross-polarized signals will not exceed the following values:

(i) in the local plane of the GSO arc under clear sky conditions:

| | | | |
|---|---|---|---|
| 22.5-25log(θ) | dBW/MHz | For | 2.0° <θ ≤ 7.0° |

where θ is defined in paragraph (a)(1) of this section.

(ii) in the plane orthogonal to the local plane of the GSO arc under clear sky conditions:

| | | | |
|---|---|---|---|
| 22.5-25log(φ) | dBW/MHz | For | 2.0° <φ ≤ 7.0° |

where φ is defined in (a)(2) of this section.

(5) A license application for a network of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates aggregate EIRP density for 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 limit specified in paragraphs (a)(1), (a)(2) and (a)(4) of this section.

**EXHIBIT 3**

**COMPARATIVE MATRIX OF FCC PROPOSALS AND SIA VIEWS**

**REVISED – MARCH 2, 2015**

| FNPRM § (¶) | FCC rationale | Existing rule | FCC proposed rule | SIA Proposal or view | SIA Rationale |
|---|---|---|---|---|---|
| n/a | 1.1107<br><br>SIA proposal to delete VSAT | § 1.1107<br><br>***<br><br>6. Fixed Satellite Very Small Aperture Terminal (VSAT) Systems: | | 6. Fixed Satellite Blanket Licensed earth stations : | To conform to SIA proposed changes to eliminate "VSAT" from the Part 25 rules. |
| G.1 (121) | 25.103 | *20/30 GHz bands.* The 18.3-20.2 GHz Fixed-Satellite Service space-to-Earth band and the 28.35-30.0 GHz Fixed-Satellite Service Earth-to-space band. | 20/30 GHz bands. 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 GSO Ka Bands: 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. | SIA proposes title change to "conventional GSO Ka bands" |
| G.2 (122) | 25.103 | *C band.* As used in this part, the terms "C band" and "conventional C band" refer to the 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space) bands. These paired bands are allocated to the Fixed-Satellite Service and are also referred to as the 4/6 GHz bands | Conventional C-band. The 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space) FSS frequency bands. | | SIA agrees with the FCC proposal for the definition of conventional C-band. |
| n/a | 25.103 | n/a | n/a | Conventional NGSO FSS Ka bands. "The 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 | SIA proposes this definition to cover the Ka-band frequencies on |

| | | | | | |
|---|---|---|---|---|---|
| | | | | GHz (Earth-to-space) frequency bands, which the Commission has designated as primary for NGSO FSS operation." | which NGSO FSS stations are primary in the United States, as a counterpart to the definition SIA has proposed for Conventional GSO Ka Bands |
| G.2 (123) | 25.103 | *12/14 GHz bands.* The 11.7-12.2 GHz Fixed-Satellite Service space-to-Earth band and the 14.0-14.5 GHz Fixed-Satellite Service Earth-to-space band. | Conventional Ku-band. The 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (earth-to-space) FSS frequency bands. | | SIA agrees with FCC proposal |
| G.3<br><br>(124) | New definition | *NGSO FSS gateway earth station.* An earth station complex consisting of multiple interconnecting earth station antennas supporting the communication routing and switching functions of a non-geostationary orbit Fixed-Satellite Service system. A gateway earth station in the NGSO FSS: (1) Does not originate or terminate radiocommunication traffic, but interconnects multiple non-collocated user earth stations operating in frequency bands other than designated gateway bands, through a satellite with other primary terrestrial networks, such as the public switched telephone network and/or Internet networks. (2) Is not for the exclusive use of any customer. (3) May also be used for telemetry, tracking, and command transmissions for the NGSO FSS system. (4) May include multiple antennas, each required to meet the antenna performance | NGSO FSS gateway earth station. An earth station or complex of multiple earth station antennas supporting the routing and switching functions of an NGSO FSS system. An NGSO FSS gateway earth station does not originate or terminate communication 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, communicating with the user-operated earth stations via links with NGSO satellites. 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. | NGSO FSS gateway earth station. "An earth station or complex of multiple earth station antennas supporting the routing and switching functions of an NGSO FSS system. An NGSO FSS gateway earth station does not originate or terminate communication traffic, but interconnects multiple earth stations via links with NGSO satellites. 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." | SIA proposes this change in definition because the current definition, as proposed to be modified in the FNPRM, does not take into account how the operation of gateway earth stations has evolved. |

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| | | standard in § 25.209(h), located within an area of one second latitude by one second longitude. Additional antennas located outside such area will be considered as a separate gateway earth station complex for purposes of coordination with terrestrial services. | | | |
| G.5 (127) | New definition | | 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 Orthogonal to Local Plane of the GSO Arc:** The plane that is orthogonal to the "local plane of 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. | SIA proposes modification to definition title and text to clarify nature of the relevant planes |
| G.5 (127) | New definition | | 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 | Local Plane of 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 with which the earth station is communicating.. | SIA proposes 1) definition title change to clarify the nature of this plane and 2) clarification edits. |
| G.6 (128) | | *Protection areas.* The geographic regions on the surface of the Earth where U.S. Department of Defense (DoD) meteorological satellite | Protection areas. The geographic regions where U.S. Department of Defense meteorological satellite systems or National Oceanic and | | SIA agrees with FCC proposal |

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| | | systems or National Oceanic and Atmospheric Administration (NOAA) meteorological satellite systems, or both such systems, are receiving signals from low earth orbiting satellites. Also, areas around 20/30 GHz 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). | 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). | | |
| n/a | | *Routine processing or licensing.* Expedited processing of unopposed applications for Fixed-Satellite Service earth stations communicating via geostationary-orbit satellites that satisfy the criteria in §25.134(a), §25.134 (g), §25.138(a), §25.211(d), §25.212(c), §25.212(d), §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)(4). | | *Routine processing or licensing*. Expedited processing of unopposed applications for Fixed-Satellite Service earth stations communicating via geostationary-orbit satellites that satisfy the criteria in §25.138(a), §25.211(d), §25.212(c), §25.212(d), §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)(4). | SIA proposes to delete VSAT throughout the Part 25 rules. |
| G.7 (129) | New definition | | Skew angle. The angle between the minor axis of an axially asymmetric antenna beam and the plane tangent to the GSO arc. | Skew angle. The angle between the minor axis of an axially asymmetric antenna | SIA agrees with FCC proposal, with consequential change in text to use the term |

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| | | | | beam and the local plane of the GSO arc. | "local plane of the GSO Arc." |
| G.9 (131) | New definition | | VSAT network. 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 and may perform other network control functions. | Deletion. | SIA proposes to delete all VSAT rules, including this definition, except those that have general application. A VSAT definition is consequently not needed. See main section of comments for discussion. |
| | 25.110(d) | (d) *Copies.* Applications must be filed electronically though IBFS. The Commission will not accept any paper version of any application.<br>(e) *Signing.* Upon filing an application electronically, the applicant must print out the filed application, obtain the proper signatures, and keep the original in its files.<br>(f) The applicant must pay the appropriate fee for its application and submit it in accordance with part 1, subpart G of this chapter. | (d) An applicant must pay the appropriate filing fee in accordance with part 1, subpart G of this chapter, at the time when it files Form 312. | | SIA agrees with FCC proposal |
| I. (135) | 25.113(g) | (g) Except as set forth in paragraph (h) of this section, a launch authorization and station license (*i.e.*, operating authority) must be | (g) Except as set forth in paragraphs (h) and (i) of this section, approval for orbital | | SIA agrees with FCC proposal |

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| | Consolidate Replacement satellite policy | applied for and granted before a space station may be launched and operated in orbit. Request for launch authorization may be included in an application for space station license. However, an application for authority to launch and operate an on-ground spare satellite will be considered pursuant to the following procedures:<br>(1) Applications for launch and operation of an on-ground spare NGSO-like satellite will be considered pursuant to the procedures set forth in §25.157, except as set forth in paragraph (g)(3) of this section.<br>(2) Applications for launch and operation of an on-ground spare GSO-like satellite will be considered pursuant to the procedures set forth in §25.158, except as set forth in paragraph (g)(3) of this section.<br><br>(3) Neither paragraph (g)(1) nor (g)(2) of this section will apply in cases where the space station to be launched 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. | 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:<br><br>(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 set forth in paragraph (g)(3) of this section.<br><br>(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 set forth in paragraph (g)(3) of this section.<br><br>(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 | | |

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| | | | launch failure or a catastrophic in-orbit failure. | | |
| I. (135) | 25.113(h) Consolidate Replacement satellite policy | (h) Operators of NGSO satellite systems licensed by the Commission need not file separate applications to operate technically identical in-orbit spares launched pursuant to a blanket license granted under §25.114(a). However, the licensee must notify the Commission within 30 days of bringing the in-orbit spare into operation and certify that its activation has not increased the number of operating space stations above the number previously authorized and that the licensee has determined by measurement that the activated spare is operating within the terms of the license. | (h) Operators of NGSO satellite systems licensed by the Commission need not file separate applications to operate technically identical in-orbit spares deployed pursuant to a blanket license granted under § 25.114(a). However, the licensee must notify the Commission within 30 days of bringing an in-orbit spare into operation and certify that its activation has not increased the number of operating space stations above the number previously authorized and that the licensee has determined by measurement that the activated spare is operating within the terms of the license | | SIA agrees with FCC proposal |
| I. (135) | 25.113(i) add<br><br>Consolidate Replacement satellite policy | | (i) <u>Replacement of Space Stations within the System License Term.</u> 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 a previously-authorized orbit within the term of the system authorization. However, the licensee must notify the | | SIA agrees with FCC proposal |

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| | | | Commission of the intended launch at least thirty days in advance and certify that its operation of the additional space station(s) will not increase the number of operating space stations above the maximum number specified in the license. | | |
| J. (137) | 25.114(c)(4)(vi)(D) | (D) For space stations 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 the area that the steerable beam(s) is expected to serve, or provide the contour information described in paragraph (c)(4)(vi)(C) of this section. | (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. | | SIA agrees with FCC proposal |
| J. (140) | 25.114(d)(15)(i) | (i) Except as set forth in paragraph (d)(15)(ii) of this section, an applicant proposing to operate in the 17.3-17.7 GHz frequency band, must provide a demonstration that the proposed space station will comply with the power flux density limits set forth in §25.208(w) of this part. | (i) Except as set forth in paragraph (d)(15)(ii) of this section, an applicant proposing to operate in the 17.3-17.7 GHz frequency band must demonstrate that the proposed space station will comply with the power flux density limits in § 25.208(w). | | SIA agrees with FCC proposal |
| J. (140) | 25.114(d)(15)(iii) | (iii) An applicant proposing to provide international service in the 17.7-17.8 GHz band must | (iii) An applicant proposing to provide international service in the 17.7-17.8 GHz band must certify | | SIA agrees with FCC proposal |

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| | | demonstrate that it will meet the power flux density limits set forth in §25.208(c) of this part. | that it will meet the power flux density limits in § 25.208(c). | | |
| J. (140) | 25.114(d)(15)(iv) | iv) The information required in §25.264(a) and (b). | (iv) Any information required by §§ 25.264(a)(6), 25.264(b)(4), or 25.264(d). | | SIA agrees with FCC proposal |
| K. (141) | 25.115(a)(2)(iii) | (iii) The equivalent diameter of the proposed antenna is 4.5 meters or greater if the station will transmit in the 5925-6425 MHz band or 1.2 meters or greater if the station will transmit in the 14.0-14.5 GHz band; | (iii) the application meets all relevant routine licensing criteria in §§ 25.134, 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 routine levels specified in § 25.138(a) or § 25.218; and | (iii) the application meets all relevant routine licensing 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 routine levels specified in § 25.138(a) or § 25.218; and | SIA agrees with FCC proposal and proposes deletion of the reference to Section 25.134 as consequential to deletion of the Section 25.134 VSAT rules |
| K. (141) | 25.115(a)(2)(iv) | (iv) If the station(s) will transmit in the 5925-6425 MHz band or the 14.0-14.5 GHz band, the performance of the proposed antenna comports with the standards in §25.209(a) and (b) and is verified in accordance with applicable provisions of §25.132; | (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 | | SIA agrees with FCC proposal |
| K. (141) | 25.115(a)(2)(v) | (v) If the station(s) will transmit in the 5925-6425 MHz band or the 14.0-14.5 GHz band, input power to the antenna will not exceed | (v) The application includes an environmental impact statement pursuant to §1.1311 of this | | SIA agrees with FCC proposal |

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| | | applicable limits specified in §§25.211 and 25.212; if the station(s) will transmit in the 28.35-28.6 GHz and/or 29.5-30.0 GHz band, off-axis EIRP density will not exceed the levels specified in §25.138(a); | chapter, if required; and | | |
| K. (141) | 25.115(a)(vi) remove and redesignate as (iv) | (vi) Operation of the proposed station has been successfully coordinated with terrestrial systems, if the station would transmit in the 5925-6425 MHz band; | (vi) The applicant does not propose to communicate via non-U.S.-licensed satellites not on the Permitted Space Station List; and | | SIA agrees with FCC proposal |
| K. (141) | 25.115(a)(vii) remove and redesignate as (v) | (vii) The applicant has provided an environmental impact statement pursuant to §1.1311 of this chapter, if required; and | (vii) If the proposed station(s) will transmit in the 28.35-28.6 GHz and/or 29.5-30 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. | | SIA agrees with FCC proposal |

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| K. (141) | 25.115(a)(2)(viii) remove and redesignate as( vi) | (viii) The applicant does not propose to communicate via non-U.S.-licensed satellites not on the Permitted Space Station List. | | | SIA agrees with FCC proposal |
| K. (141) | 25.115(a)(2)(ix) remove and redesignate as(vii) | (ix) If the proposed station(s) will transmit in the 28.35-28.6 GHz and/or 29.5-30 GHz bands, the applicant is proposing 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. | | | SIA agrees with FCC proposal |
| K. (142) | 25.115(c)(1) | (c)(1) Large Networks of Small Antennas operating in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands with U.S.-licensed or non-U.S.-licensed satellites for domestic or international services. Applications to license small antenna network systems operating in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency band under blanket operating authority shall be filed on FCC Form 312 and | (c)(1) <u>Large Networks of Small Antennas operating in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands with U.S.-licensed or non-U.S.-licensed satellites for domestic or international services.</u> Applications to license small antenna network systems operating in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency band under blanket operating authority may be filed on FCC Form 312 or | (c)(1) Large Networks of Earth Station Antennas operating in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands with U.S.-licensed or non-U.S.-licensed satellites for domestic or international services. Applications to license large networks of earth station antennas operating in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency band under | SIA agrees with the new FCC text and proposes modifications to align with other SIA proposals for deletion of VSATs |

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| | | Schedule B, for each large (5 meters or larger) hub station, and Schedule B for each representative type of small antenna (less than 5 meters) operating within the network | Form 312EZ, with a Schedule B for each large (5 meters or larger) hub station and each representative type of small antenna (less than 5 meters) operating within the network. | blanket operating authority may be filed on FCC Form 312 or Form 312 EZ with a Schedule B, for each large (5 meters or larger) hub station, and each representative type of small antenna (less than 5 meters) operating within the network | |
| K. (142) | 25.115(c)(1)(i) and (ii) | | | 25.115(c)(1)(i) Applications under provision (c)(1) above that meet the requirements of §§ 25.212 (c) and 25.218 will be routinely processed.<br><br>(ii) Applications under provision (c)(1) above that do not meet the requirements of §§ 25.212 (c) and 25.218 must comply with the requirements in §25.220. | SIA proposes to add (in lieu of §25.134(g)). Consequential to the SIA proposal to delete<br><br>VSAT provisions. |
| K. (142) | 25.115(c)(2) | (c)(2) Large Networks of Small Antennas operating in the 4/6 GHz frequency bands with U.S.-licensed or non-U.S. licensed satellites for domestic services (CSATs). Applications to license small antenna network systems operating in the standard C-Band, 3700-4200 MHz and 5925-6425 MHz frequency band shall be filed | | 25.115(c)(2) Large Networks of Antennas operating in the 4/6 GHz frequency bands with U.S.-licensed or non-U.S. licensed satellites for domestic services (CSATs). Applications to license small antenna networks systems operating in the standard C-Band, 3700–4200 MHz and 5925–6425 | SIA proposes to amend (to incorporate relevant portions of §25.134(a)(2)) |

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| | | electronically on FCC Form 312, Main Form and Schedule B. | | MHz frequency band shall be filed electronically on FCC Form 312, Main Form and Schedule B. Applications for networks employing antennas that are 4.5 meter or larger in diameter will be routinely processed provided that they comply with §25.209, the power levels are consistent with §25.211(d) and §25.212(d), and frequency coordination has been satisfactorily completed. | |
| K. (142) | 25.115(c)(2) | 25.115(c)(2)(i) An initial lead application providing a detailed overview of the complete network shall be filed. Such lead applications shall fully identify the scope and nature of the service to be provided, as well as the complete technical details of each representative type of small antenna (less than 4.5 meters) that will operate within the network. Such lead applications for a single CSAT system must identify:<br><br>(A) No more than three discrete geostationary satellites to be accessed;<br><br>(B) The amount of frequency bandwidth sought, up to a maximum of 20 MHz of spectrum in each direction at each of the | | 25.115(c)(2)(i) <u>The use of smaller earth station antennas or non-consistent power levels requires the submission of</u> an initial lead application providing a detailed overview of the complete earth station network. Such lead applications shall fully identify the scope and nature of the service to be provided, as well as the complete technical details of each representative type of small antenna (less than 4.5 meters) that will operate within the earth station network. Such lead applications for a single CSAT system must identify: | SIA proposes to amend to incorporate relevant portions of §25.134(a)(2) |

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| | | satellites (The same 20 MHz of uplink and 20 MHz of downlink spectrum at each satellite would be accessible by all CSAT earth stations in the system. The 20 MHz of uplink and 20 MHz of downlink spectrum need not be the same at each satellite location);<br><br>(C) The maximum number of earth station sites; | | (A) No more than three discrete geostationary satellites to be accessed;<br><br>(B) The amount of frequency bandwidth sought, up to a maximum of 20 MHz of spectrum in each direction at each of the satellites (The same 20 MHz of uplink and 20 MHz of downlink spectrum at each satellite would be accessible by all CSAT earth stations in the system. The 20 MHz of uplink and 20 MHz of downlink spectrum need not be the same at each satellite location);<br><br>(C) The maximum number of earth station sites; | |
| | 25.115(c)(3) | | | (c)(3) Remote earth stations operated under blanket licensed authority must stop transmission when synchronization to signals from the target satellite fails. | Consequential to SIA proposal to delete VSAT regulations and §25.134 |
| K. (143) | 25.115(e) | (e) Earth stations operating in the 20/30 GHz Fixed-Satellite Service with U.S.-licensed or non-U.S. licensed satellites: Applications to license individual earth stations operating in the 20/30 GHz band shall be filed on FCC Form 312, Main Form and Schedule B, and | (e) License applications for earth stations operating in any portion of the 18.3-20.2 GHz and 28.35-30.0 GHz bands 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 § | (e) License applications for earth stations operating in any portion of the 18.3-20.2 GHz and 28.35-30.0 GHz bands 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 | SIA agrees with FCC proposal but proposes modification to "conventional GSO Ka bands" instead of "20/30 GHz bands" and proposes new definition of "conventional NGSO |

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| | | shall also include the information described in §25.138. Earth stations belonging to a network operating in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz or 29.25-30.0 GHz bands may be licensed on a blanket basis. Applications for such blanket authorization may be filed using FCC Form 312, Main Form and Schedule B, and specifying the number of terminals to be covered by the blanket license. Each application for a blanket license under this section shall include the information described in §25.138. | 25.130. An applicant may request authority for operation of GSO FSS earth stations in the 20/30 GHz bands without specifying the location of user terminals but must specify 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.<br><br>***** | section or by § 25.130. An applicant may request authority for operation of GSO FSS earth stations in the conventional GSO Ka bands, or operation of NGSO FSS earth stations in the conventional NGSO FSS Ka bands, without specifying the location of user terminals but must specify 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.<br>***** | FSS Ka bands" as consequential to SIA proposal for definition. |
| F.19 (108-111) | 25.115(g) | (g) Applications for feeder link earth stations operating in the 24.75—25.25 GHz band (Earth-to-space) and providing service to geostationary satellites in the 17/24 GHz BSS must include, in addition to the particulars of operation identified on Form 312 and associated Schedule B, the information specified in either paragraph (g)(1) or (g)(2) below for each earth station antenna type: | (g) Applications for earth stations that will transmit to geostationary satellites in any portion of the 5850-7025 MHz, 12.75-13.25 GHz, 13.75-14.5 GHz, 24.75-25.25 GHz, 28.35-28.6 GHz, or 29.25-30.0 GHz band must include, in addition to the particulars of operation identified on Form 312 and associated Schedule B, the information specified in either paragraph (g)(1) or (g)(2) below for each earth station antenna type. | | SIA agrees with FCC proposal |
| F.19 (108-111) | 25.115(g)(1) | (1) A series of EIRP density charts or tables, calculated for a production earth station antenna, based on measurements taken on a calibrated antenna range at 25 | (1) Specification of off-axis EIRP density calculated from measurements made consistent with the requirements in § 25.132(b)(1), in accordance with | (1) Specification of off-axis EIRP density calculated from measurements made consistent with the requirements in § | SIA agrees with FCC proposal with the modifications to address "off axis angle". |

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| | | GHz, with the off-axis EIRP envelope set forth in paragraphs (g)(1)(i) through (g)(1)(iv) of this section superimposed, as follows: | 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. | 25.132(b)(1), in accordance with the following requirements. For the purposes of this rule" Off axis angle" is defined in the appropriate off axis eirp density rule sections | |
| F.19 (108-111) | 25.115(g)(1)(i) | (i) Showing off-axis co-polarized EIRP spectral density in the azimuth plane, for off-axis angles from minus 10° to plus 10° and from minus 180° to plus 180°; | (i) A plot of maximum co-polarized EIRP density in the plane tangent to the GSO arc, for off-axis angles from minus 180° to plus 180° | (i) A plot of maximum co-polarized EIRP density in the local plane of GSO arc, for off-axis angles from minus 180° to plus 180 | SIA proposes consequential modification regarding local plane of the GSO Arc |
| F.19 (108-111) | 25.115(g)(1)(ii) | (ii) Showing off-axis co-polarized EIRP spectral density in the elevation plane, at off-axis angles from 0°to plus 30° | (ii) A plot of maximum cross-polarized EIRP spectral density in the plane tangent to the GSO arc at off-axis angles from minus 10° to plus 10°; | (ii) A plot of maximum cross-polarized EIRP spectral density in the local plane of the GSO arc at off-axis angles from minus 7° to plus 7°; | SIA proposes consequential modifications regarding limiting cross polarization to 7 ° or less and local plane of the GSO arc |
| F.19 (108-111) | 25.115(g)(1)(iii) | (iii) Showing off-axis cross-polarized EIRP spectral density in the azimuth plane, at off-axis angles from minus 10° to plus 10°; and | (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°; | (iii) A plot of maximum co-polarized EIRP density in the plane orthogonal to the local plane of the GSO arc at off-axis angles from 0° to plus 30°; | SIA proposes consequential modification regarding local plane of the GSO Arc definition |

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| F.19 (108-111) | 25.115(g)(1)(iv) | (iv) Showing off-axis cross-polarized EIRP spectral density in the elevation plane, at off-axis angles from minus 10° to plus 10° | (iv) A plot of maximum cross-polarized EIRP density in the plane tangent to the GSO arc at off-axis angles from minus 10° to plus 10°; | . reserved | This text is redundant with (ii) above |
| F.19 (108-111) | 25.115(g)(1)(v) add | | (v) A plot of maximum cross-polarized EIRP density in the plane perpendicular to the GSO arc at off-axis angles from minus 10° to plus 10°; | (v) A plot of maximum cross-polarized EIRP density in the plane orthogonal to the local plane of the GSO arc at off-axis angles from minus 7° to plus 7°; | SIA proposes consequential modifications regarding limiting cross polarization to 7° or less. and plane orthogonal local plane of the GSO arc definition |
| F.19 (108-111) | 25.115(g)(1)(vi) add | | (vi) 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 (i)-(v) above | | SIA agrees with FCC proposal |
| F.19 (108-111) | 25.115(g)(1)(vii)add | | (vii) The showing must include a supplemental table for each off-axis angular range in which the relevant routine EIRP density envelope will be exceeded, specifying angular coordinates in degrees off-axis and corresponding calculated off-axis EIRP density at 0.2 degree increments over the angular range in which the routine | | SIA agrees with FCC proposal |

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| | | | envelope will be exceeded and one degree on each side of that range. | | |
| F.19 (108-111) | 25.115(g)(2) | (2) A certification on Schedule B that the antenna conforms to the gain pattern criteria of §25.209(a) and (b), that when combined with input power density (computed from the maximum on-axis EIRP density per carrier less the antenna gain entered in Schedule B), demonstrates that the off-axis EIRP spectral density envelope set forth in §25.223(b)(1) through (4) of this part will be met. | (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 a relevant limit in § 25.134, 25.211, or 25.212 need not provide a showing pursuant to paragraph (g)(1) of this section for operation with that antenna. | (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 a 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. | SIA agrees with FCC proposal with the modification to delete cite to 25.134. |
| F.19 (109)<br><br>App. A, para 9 | 25.115(h) remove and reserve | h) Any earth station applicant filing an application pursuant to §25.218 of this chapter must file three tables showing the off-axis EIRP level of the proposed earth station antenna of the plane of the geostationary orbit, the elevation plane, and towards the horizon. In each table, the EIRP level must be provided at increments of 0.1° for angles between 0° and 10° off-axis, and at increments of 5° for angles between 10° and 180° off-axis.<br>(1) For purposes of the off-axis EIRP table in the plane of the geostationary orbit, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the target | reserved | | SIA agrees with FCC proposal |

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| | | satellite, within the plane determined by the focal point of the antenna and the line tangent to the arc of the geostationary satellite orbit at the position of the target satellite.<br>(2) For purposes of the off-axis EIRP table in the elevation plane, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the target satellite, within the plane perpendicular to the plane determined by the focal point of the antenna and the line tangent to the arc of the geostationary satellite orbit at the position of the target satellite.<br>(3) For purposes of the off-axis EIRP table towards the horizon, the off-axis angle is the angle in degrees from the line determined by the intersection of the horizontal plane and the elevation plane described in paragraph (h)(2) of this section, in the horizontal plane. The horizontal plane is the plane determined by the focal point of the antenna and the horizon. | | | |
| n/a | 25.115(i) | (i) Any earth station applicant filing an application for a VSAT network made up of FSS earth stations and planning to use a contention protocol must include in its application a certification that it will comply with the requirements of §25.134(g)(4). | | (i) Any earth station applicant filing an application to operate a blanket licensed earth station network and planning to use a contention protocol must certify that its contention protocol usage will be reasonable. | SIA proposes to move 25.134(g)(4) here to replace this rule. SIA proposes changes to address deletion of VSAT. |

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| n/a | 25.115(l) Add | | | 25.115(l) Blanket licensed earth station networks may use more than one hub earth station, and the hubs may be sited at different locations. | SIA proposes to amend and move from 25.134(e) |
| n/a | 25.115(m) Add | | | 25.115(m) Blanket licensed earth station networks may use temporary fixed earth stations as hub earth stations or remote earth stations in their networks, but must specify, in their license applications, the number of temporary fixed earth stations they plan to use. | SIA proposes to amend and move 25.134(f) to 25.115(m) |
| M.1. (148) | 25.118(a)(1) | (1) Licensees may make changes to their authorized earth stations without obtaining prior Commission authorization, provided that they have complied with all applicable frequency coordination procedures in accordance with §25.251, and the modification does not involve:<br><br>(i) An increase in EIRP or EIRP density (both main lobe and side lobe);<br><br>(ii) An increase in transmitted power;<br><br>(iii) A change in coordinates of more than 1 second in latitude or | (1) Authorized VSAT earth station operators may add VSAT remote terminals without prior authorization, provided that they have complied with all applicable frequency coordination procedures in accordance with § 25.251. | (1) Authorized blanket licensed earth station operators may add remote terminals operating on a primary basis without prior authorization, provided that they have complied with all applicable frequency coordination procedures in accordance with § 25.251. | SIA proposes alternative text for reference to VSATs and clarifies that the remote terminals are operating on a primary basis. |

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| | | longitude for stations operating in frequency bands that are shared with terrestrial systems; or<br><br>(iv) A change in coordinates of 10 seconds or greater in latitude or longitude for stations operating in frequency bands that are not shared with terrestrial systems. | | | |
| M.1. (148) | 25.118(a)(4) | (4) 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 Form 312 within 30 days after the completed change to common carrier status. | (4) Licensees may make other changes to their authorized earth stations without prior authority from the Commission, provided the modification does not involve:<br><br>(i) An increase in EIRP or EIRP density (either main lobe or off-axis);<br><br>(ii) A change in operating frequencies;<br><br>(iii) 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; | SIA proposes modification of<br><br>(vi) Antenna repointing beyond the range coordinated pursuant to § 25.251;<br><br>And deletion of<br><br>"(vii) A change in the location of a remote control point." | SIA proposes modification for Antenna pointing. It is necessary during fleet managements and permitted list points of communication, SIA proposes deletion of remote control point provision. |

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| | | | (iv) A change in polarization;<br><br>(v) An increase in antenna height;<br><br>(vi) Antenna repointing; or<br><br>(iv) A change in the location of a remote control point. | | |
| M.1. (150) | 25.118(a)(5) | (5) Earth station operators may change their points of communication without prior authorization, provided that the change results from a space station license modification described in paragraph (e) of this section, and the earth station operator does not repoint its antenna. Otherwise, any modification of an earth station license to add or change a point of communication will be considered under §25.117. | Remove | | SIA agrees with FCC proposal |
| M.1. (148) | 25.118(b) | (b) *Earth station license modifications, notification not required.* Notwithstanding paragraph (a)(2) 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. | (b) <u>Earth station license modifications, notification not required</u>. 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 | | SIA agrees with FCC proposal |

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| P 86 FCC invites comment on SIA suggestion. | 25.130(e) | reserved | | (e) Blanket licensed earth stations transmitting in the frequency bands 14.0-14.5 GHz, 28.35-28.6 GHz and 29.5-30.0 GHz that operate with an EIRP of 60 dBW or less may alternatively be licensed without the provision of technical data. Licensees making use of this provision must certify that earth stations will be operated in a manner compliant with Part 25 rules. All earth stations licensed under this provision will be tested for compliance with the technical provisions of Part 25, and the applicant shall maintain the test report on file. | SIA proposal for alternative licensing approach for 60 dBW EIRP earth stations. See main section of comments for discussion. |
| n/a | Note to 25.130(g) | NOTE TO PARAGRAPH (g): This paragraph does not apply to applications filed pursuant to §25.134, §25.138, §25.221, §25.222, §25.226, or §25.227 or to | NOTE TO PARAGRAPH (g): This paragraph does not apply to VSAT network applications filed pursuant to § 25.115(c) or § 25.218; applications for 20/30 GHz hub | NOTE TO PARAGRAPH (g): This paragraph does not apply to blanket licensed Earth station network applications filed pursuant to § 25.115(c) or § | SIA proposes to rename VSAT as consequential to proposal to delete VSAT's |

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| | | applications for 29 GHz NGSO MSS feeder link stations in a complex as defined in §25.257. | 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. | 25.218; applications for conventional GSO 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. | SIA proposes consequential modification for "conventional GSO Ka-band to replace 20/30 GHz. |
| Q. (164) | 25.131(b) | (b) Receive-only earth stations in the Fixed-Satellite Service that operate with U.S.-licensed satellites, or that operate with non-U.S.-licensed satellites on the Permitted Space Station List in accordance with paragraph (j) of this section, 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(e). | (b) Receive-only earth stations in the Fixed-Satellite Service 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(e). | Note 25.209 (e) has been removed in the FCC proposals.<br><br>b) Receive-only earth stations in the Fixed-Satellite Service 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 | SIA agrees with FCC proposal with modification to 25.209(c) instead of 25.209(e) which the Commission proposed for deletion |

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| | | | | the stricture in § 25.209(c). | |
| | 25.132 title | §25.132 Verification of earth station antenna performance standards | <u>§ 25.132 Verification of earth station antenna performance.</u> | | SIA agrees with FCC proposal |
| F.12, 18, 19 (80, 92, 102) | 25.132(a)(1) | a)(1) Except for applications for 20/30 GHz earth stations and applications subject to the requirement in paragraph (b)(3) of this section, applications for transmitting earth stations in the Fixed-Satellite Service, including feeder-link stations, must include 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 the off-axis gain standards in §25.209, measured in accordance with paragraph (b)(1) of this section. The licensee must be prepared to submit the radiation pattern measurements to the Commission on request. | (a)(1) Except as provided in paragraph (a)(2) of this section, applications for transmitting earth stations in the Fixed-Satellite Service, including feeder-link stations, must include 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. | | SIA agrees with FCC proposal |
| F.12, 18, 19 (80, 92, 102) | 25.132(a)(2) | 2) Applications for transmitting GSO FSS earth stations operating in the 20/30 GHz band must include the antenna measurements specified in §25.138(d) and (e). Applications for transmitting NGSO FSS earth stations operating in the 20/30 GHz band must include the | (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. | | SIA agrees with FCC proposal |

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| | | antenna measurements specified in §25.138(d). | | | |
| F.19 (102) | 25.132(b)(1) | (b)(1) For purposes of paragraph (a)(1) of this section, the following measurements on a production antenna performed on calibrated antenna range, as a minimum, must be made at the bottom, middle and top of each allocated frequency band: | (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 | | SIA agrees with FCC proposal |
| F.19 (102) | 25.132(b)(1)(i)(A) | (i) Co-polarized patterns in the E- and H-planes for linear-polarized antennas or in two orthogonal cuts for circularly-polarized antennas:<br><br>(A) In the azimuth plane, plus and minus 7 degrees and plus and minus 180 degrees from beam peak. | (i) (A) Co-polarized gain in the azimuth plane must be measured across a range extending to 180 degrees on each side of the main-lobe axis, and the measurements must be represented in two plots: one across the entire angular range of ±180 degrees from the main-lobe axis and the other across ±10 degrees from the main-lobe axis. | (i) (A) Co-polarized gain in the main plane must be measured across a range extending to 180 degrees on each side of the main-lobe axis, and the measurements must be represented in two plots: one across the entire angular range of ±180 degrees from the main-lobe axis and the other across ±10 degrees from the main-lobe axis. | SIA agrees with the FCC proposal with the change to “main plane” which is consequential to other SIA proposals |

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| F.19 (102 | 25.132(b)(1)(ii) | (ii) Cross-polarization patterns in the E- and H-planes for linear-polarized antennas or in two orthogonal cuts for circularly-polarized antennas, plus and minus 9 degrees from beam peak. | (ii) Cross-polarization gain must be measured across a range of plus and minus 10 degrees from beam peak in the azimuth and elevation planes | (ii) Cross-polarization gain must be measured across a range of plus and minus 7 degrees from beam peak in the main plane and the plane orthogonal to the main plane | SIA proposes that cross pol requirements be limited to 7° or less and that " main plane" and " plane orthogonal to main plane" be used as consequential to other SIA proposals regarding antenna performance; SIA also supports deletion of E and H plane. |
| F.19 (102) | 25.132(b)(1)(iii) | (iii) Main beam gain. | (iii) Main beam gain. | | |
| F.19 (102) | 25.132(b)(1)(iv) add | | (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, measurements must be made at the worst-case skew angle at which the antenna will operate. | 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 local plane of the GSO arc, measurements must be made at the worst-case skew angle at which the antenna will operate. | SIA agrees with FCC proposal with consequential edit for local plane of the GSO arc. |
| F.19 (107) | 25.132(b)(2) | (2) The FCC envelope specified in §25.209 shall be superimposed on each pattern. The 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. | (2) The relevant envelope specified in § 25.209 must be superimposed on each measured pattern. | | SIA agrees with FCC proposal |
| F.19 (108) | 25.132 (b)(3) remove | (3) Except as provided in paragraph (d) of this section, applicants seeking authority to operate a Fixed-Satellite Service earth station pursuant to the requirements in §25.218, §25.220, §25.221, §25.222, §25.223, §25.226, or §25.227 | remove | SIA supports this change | SIA supports the FCC proposal to delete 25.132(b)(3) and amend 25.132(a) to state that applicants specify off axis eirp density pursuant to requirements in |

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| | | must submit a copy of the manufacturer's range test plots of the antenna gain patterns specified in paragraph (b)(1) of this section. | | | 25.115(g)(1) are not subject to certification requirements in 25.132(a)(1) and need not submit antenna gain patterns. |
| R. (167) | 25.133(b)(2) | (2) For earth stations authorized under any blanket licensing provision in this chapter, a certification containing the information in paragraph (b)(1) of this section must be filed when the network is put into operation. | (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 each 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. | | SIA agrees with FCC proposal |
| | 25.134 title changed & added 20/30 GHz | §25.134 Licensing provisions for Very Small Aperture Terminal (VSAT) and C-band Small Aperture Terminal (CSAT) networks. | § 25.134 Licensing provisions for 4/6 GHz, 12/14 GHz, and 20/30 GHz VSAT networks. | Reserved | SIA proposes deletion of 25.134 in its entirety. See main section of comments for discussion. |
| F.14 (83) | 25.134(a) add | (a)(1) [Reserved] | (a) A license application for operation of a VSAT network in the 4/6 GHz bands may be routinely processed if frequency coordination has been satisfactorily completed pursuant to § 25.203 and the criteria in paragraph (a)(1) or (2) are met: | Deletion | SIA instead proposes that the Commission forgo defining the ambiguous term “VSAT” and instead make use of blanket licensed earth station networks instead. Such a change would make this proposal unnecessary. |

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| F.14 (85) | 25.134(a)(1)(i) | | (1) (i) Equivalent antenna diameter is 4.5 meters or more, and 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); | Deletion | |
| F.9. (76) | 25.134(a)(1)(ii) | | (ii) The input power of any full-transponder analog video transmission will not exceed the relevant limit in Section 25.211(d), and the bandwidth and input power density of any other type of analog transmission will not exceed the relevant limits in § 25.212(d); | Deletion | See main section of comments for discussion. |
| F.7 (66) | 25.134(a)(1)(iii) | | (iii) The power density of any digitally modulated carrier will not exceed −2.7 − 10log(N) dBW/4 kHz at the input of any network antenna. "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. | Deletion | See SIA proposal for Section 25.225(1) |
| F.14 (84) | 25.134(a)(2) | (2) *Large Networks of Small Antennas operating in the 4/6 GHz frequency bands.* All | (2) The application is not subject to an exclusion in § 25.218(a)(1) or (2) and includes tables filed pursuant to | Deletion. | It is confusing to have application requirements in two |

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| | | applications for digital and/or analog operations will be routinely processed provided the network employs antennas that are 4.5 meter or larger in diameter, that are consistent with §25.209, the power levels are consistent with §§25.211(d) and 25.212(d), and frequency coordination has been satisfactorily completed. The use of smaller antennas or non-consistent power levels require the filing of an initial lead application (§25.115(c)(2)) that includes all technical analyses required to demonstrate that unacceptable interference will not be caused to any and all affected adjacent satellite operators by the operation of the non-conforming earth station. | § 25.115(g)(1) indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in § 25.218. | | separate sections (§25.115 & §25.134). Technical rules already established in §25.211(d), §25.212(d) and §25.218(d), which can be cross-referenced in §25.115. Antennas compliant with these rules are eligible for routine processing. Non-compliant antennas addressed in §25.220.<br><br>Second sentence is already covered by §25.115(c)(2)(i).<br><br>SIA supports the FCC proposal but recommends that it be implemented so as to apply to both blanket licensed and individually licensed stations that could operate under 25.211 or 25.212. |
| F.14 (85) | 25.134(b) | (b) *VSAT networks operating in the 12/14 GHz band.* An applicant for a VSAT network authorization proposing to operate with transmitted power spectral density and/or antenna input power in excess of the values specified in paragraph (g) of this section must comply with the requirements in §25.220. | (b) Applications for VSAT operation in the 12/14 GHz bands may be routinely processed if the criteria in the following paragraph (1) or (2) are met. | Deletion. | SIA view is that any Ku band earth stations which exceed the levels in §25.218 can apply the rules of §25.220 as well. Those under §25.212(c)(2) do not automatically invoke §25.220, which would need to be fixed. |

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| F.14 (85) | 25.134(b)(1)(i) add | | (1)(i) Equivalent antenna diameter is 1.2 meters or more, and 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); | Deletion | SIA proposes to delete. See main section of comments for discussion. SIA proposes to eliminate the minimum antenna diameter requirement. |
| F.9 (76) | 25.134(b)(1)(ii) add | | (ii) The input power of any full-transponder analog video transmission will not exceed the relevant limit in Section 25.211(d), and the bandwidth and input power density of any other type of analog transmission will not exceed the relevant limits in § 25.212(c); | Deletion | SIA proposes to delete. See main section of comments for discussion. |
| F.7 (66) | 25.134(b)(1)(iii) add | | (iii) The power spectral density of any digitally modulated carrier into any transmitting earth station antenna in the proposed network will not exceed −14.0 − 10log(N) dBW/4 kHz. N is the number of network earth stations that transmitting simultaneously in the same frequencies to the same target satellite, not counting packet burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. | Deletion | SIA proposes to delete the VSAT provisions. See analysis in Annex A regarding 10 log(N)<br><br>Satellites employing spot beams may use different size spots. As spot size increases G/T decreases and victim satellite is less sensitive to multiple co-frequency transmissions from adjacent satellite. Interference is further mitigated by the fact that spot beam satellites tend to have orthogonality in reuse patterns. |

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| | | | | | Spot beam satellites have been operating for some time and Commission has not identified any problems to date with current definition of N = 1 for TDMA and FDMA. |
| F.14 (84) | 25.134(b)(2) add | | (2) The application is not subject to an exclusion in § 25.218(a)(1) or (2) and includes tables filed pursuant to § 25.115(g)(1) indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in § 25.218. | deletion | SIA proposes to delete the VSAT provisions. See SIA narrative for rationale |
| F.12 (80) | 25.134(c) add | (c) [Reserved] | (c) Applications for VSAT 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 band may be routinely processed if the criteria in the following paragraph (1) or (2) are met: | deletion | SIA proposes to delete the VSAT provisions. See main section of comments for discussion. |
| F.12 (81) | 25.134(c)(1)(i) add | | (1)(i) Equivalent antenna diameter is at least 0.66 meters and the applicant certifies pursuant to § 25.132(a)(1) that the off-axis gain of transmitting antennas in the | Deletion | SIA proposes to simply certify the off-axis gain compliance. SIA proposes deleting all VSAT provisions. |

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| | | | network will not exceed the relevant levels specified in § 25.209(a) and (b); | | SIA proposes to eliminate the minimum antenna diameter requirement. |
| F.12 (81) | 25.134(c)(1)(ii) add | | (ii) The power spectral density of any digitally modulated carrier into any transmitting earth station antenna in the proposed network will not exceed 3.5 – 10log(N) dBW/MHz. "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. | deletion | SIA proposes deleting all VSAT provisions. See main section of comments for discussion. |
| F.12 (81) | 25.134(c)(2) add | | (2) The application includes tables filed pursuant to § 25.115(g)(1) indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in § 25.138. | deletion | SIA proposes deleting all VSAT provisions. See SIA narrative for rationale. |
| n/a | 25.134(d) | (d) An application for VSAT authorization shall be filed on FCC Form 312, Main Form and Schedule B. | | Deletion. | SIA proposes deletion of all VSAT provisions This provision is redundant with Section 25.115(c)(1). |
| n/a | 25.134(e) | (e) VSAT networks operating in the 12/14 GHz bands may use more than one hub earth | | Relocation.<br>Revise and move to §25.115(l). | SIA proposes this provision be amended |

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| | | station, and the hubs may be sited at different locations. | | | and moved to Section 25.115. |
| n/a | 25.134(f) | (f) 12/14 GHz VSAT operators may use temporary fixed earth stations as hub earth stations or remote earth stations in their networks, but must specify, in their license applications, the number of temporary fixed earth stations they plan to use. | | Relocation.<br>Revise and move to §25.115(m). | SIA proposes this provision be moved to Section 25.115. |
| F.8 (73-75) | 25.134(g) remove | (g) Applications for VSAT operation in the 12/14 GHz bands that meet the following requirements will be routinely processed: | | Deletion. | Applications under 25.212(c) and 25.218 are already eligible for routine processing. This provision is redundant. |
| F.8 (73-75) | 25.134(g)(1) remove | (1) Equivalent antenna diameter is 1.2 meters or more and the application includes certification of conformance with relevant antenna performance standards in §25.209 pursuant to §25.132(a)(1). | | Deletion. | These technical rules are encompassed by Section 25.212 (c)(2) and Section 25.218. SIA proposes to eliminate the minimum antenna diameter requirement. |
| F.8 (73-75) | 25.134(g)(2) remove | 2) The maximum transmitter power spectral density of a digital modulated carrier into any GSO FSS earth station antenna does not exceed −14.0 − 10log(N) dB(W/4 kHz). For a VSAT network using a frequency division multiple access (FDMA) or a time division multiple access (TDMA) technique, N is equal to one. For a VSAT network using a code division multiple access (CDMA) technique, N is the | | Deletion. | These technical rules are encompassed by Section 25.212 (c)(2) and Section 25.218. |

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| | | maximum number of co-frequency simultaneously transmitting earth stations in the same satellite receiving beam. | | | |
| F.8 (73-75) | 25.134(g)(3) remove | (3) The maximum GSO FSS satellite EIRP spectral density of the digital modulated emission does not exceed 10 dB(W/4kHz) for all methods of modulation and accessing techniques. | | Deletion | This technical requirement is already captured in 25.212(c)(2) |
| F.8 (73-75) | 25.134(g)(4) remove | (4) Any earth station applicant filing an application to operate a VSAT network in the 12/14 GHz bands and planning to use a contention protocol must certify that its contention protocol usage will be reasonable. | | Deletion.<br>Amend -and Move and replace §25.115(i). | Use of contention protocol could apply outside of VSAT. SIA proposes to amend and move this provision to replace 25.115(i) |
| F.8 (73-75) | 25.134(g)(5) | (5) The maximum transmitter power spectral density of an analog carrier into any GSO FSS earth station antenna does not exceed −8.0 dB(W/4kHz) and the maximum GSO FSS satellite EIRP spectral density does not exceed +17dB(W/4kHz). | | Deletion. | SIA proposes deletion.. These are the same values as in §25.212(c)(1). It is furthermore proposed that analog operations for VSAT are no longer common practice. |
| | 25.134(h) redesignated as (g) | (h) VSAT operators licensed pursuant to this section 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. | (g) VSAT operators licensed pursuant to this section 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. | Deletion.<br>Revise and move to 25.115(c)(1).<br><br>*25.115(c)(1) Remote earth stations operated under blanket licensed authority must stop transmission when synchronization to signals from the target satellite fails.* | This provision -is more applicable in 25.115. |
| G.1 (121) | 25.138 title mod | §25.138 Licensing requirements for GSO FSS Earth Stations in the 18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), | <u>§ 25.138 Licensing requirements for GSO FSS Earth Stations in the 20/30 GHz bands</u> | <u>§ 25.138 Licensing requirements for conventional GSO Ka band FSS Earth Stations</u> | SIA proposes modification consequential to definition of |

<table>
<tr><td></td><td></td><td>28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space) bands.</td><td></td><td></td><td>conventional GSO Ka bands to replace 20/30 GHz</td></tr>
<tr><td>S. (169)</td><td>25.138(a)</td><td>a) Applications for earth station licenses in the GSO FSS in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30.0 GHz bands that indicate that the following requirements will be met and include the information required by paragraph (d) of this section will be routinely processed:</td><td>(a) Applications for earth station licenses in the GSO FSS in the 20/30 GHz bands 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:</td><td>a) Applications for earth station licenses in the conventional GSO KA band FSS 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:</td><td>SIA proposes modification consequential to definition of conventional GSO Ka bands to replace 20/30 GHz</td></tr>
<tr><td>F.12 (80)</td><td>25.138(a)(1)</td><td>(1) GSO FSS earth station antenna off-axis EIRP spectral density for co-polarized signals shall not exceed the following values, within ±3° of the GSO arc, under clear sky conditions:
<table>
<tr><td>18.5-25log(θ)-10log(N)</td><td>dBW/40kHz</td><td>for 2.0° ≤θ ≤7°</td></tr>
<tr><td>−2.63-10log(N)</td><td>dBW/40kHz</td><td>for 7° ≤θ ≤9.23°</td></tr>
<tr><td>21.5-25log(θ)-10log(N)</td><td>dBW/40kHz</td><td>for 9.23° ≤θ ≤48°</td></tr>
<tr><td>−10.5-10log(N)</td><td>dBW/40kHz</td><td>for 48° <θ ≤180°</td></tr>
</table>
Where:<br>θ is the angle in degrees from the axis of the main lobe; for systems where more than one earth station is expected to transmit simultaneously in the</td><td>(1) The EIRP spectral 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:
<table>
<tr><td>32.5-25log(θ)-10log(N)</td><td>dBW/MHz</td><td>for 2.0° ≤θ ≤7°</td></tr>
<tr><td>11.35-10log(N)</td><td>dBW/MHz</td><td>for 7° ≤θ ≤9.23°</td></tr>
<tr><td>35.5-25log(θ)-10log(N)</td><td>dBW/MHz</td><td>for 9.23° ≤θ ≤48°</td></tr>
<tr><td>3.5-10log(N)</td><td>dBW/MHz</td><td>for 48° <θ ≤180°</td></tr>
</table>
where θ is the angle in degrees from a line from the earth station antenna to the assigned location of the target satellite. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, “N” is the maximum number of network earth stations transmitting</td><td>(1) The EIRP spectral density of co-polarized signals in the local plane of the GSO arc, as defined in § 25.103, will not exceed the following values under clear sky conditions:
<table>
<tr><td>32.5-25log(θ)</td><td>dBW/MHz</td><td>for 2.0° ≤θ ≤7°</td></tr>
<tr><td>11.35</td><td>dBW/MHz</td><td>for 7° ≤θ ≤9.23°</td></tr>
<tr><td>35.5-25log(θ)</td><td>dBW/MHz</td><td>for 9.23° ≤θ ≤~~48~~19.1~~8~~°</td></tr>
<tr><td>3.5</td><td>dBW/MHz</td><td>for ~~48~~19.1° <θ ≤180°</td></tr>
</table>
where θ is the angle in degrees from the axis of the main lobe measured in the local plane of the GSO arc .</td><td>SIA -supports 1MHz Reference BW and proposes deletion of 10 log (N) and replacing it with a modified Section 25.138(a)(5); retention of theta definition from current 25.138(a)(1) instead of FCC proposal and local plane of the GSO arc.<br><br>SIA proposes to flatten the mask from 19.1 – 180°.</td></tr>
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<td>same bandwidth, e.g., CDMA systems,<br>N is the likely maximum number of simultaneously transmitting co-frequency earth stations in the receive beam of the satellite; N=1 for TDMA and FDMA systems.</td>
<td>simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation.</td>
<td></td>
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</tr>
<tr>
<td>F.12<br>(80)</td>
<td>25.138(a)(2)</td>
<td>(2) GSO FSS earth station antenna off-axis EIRP spectral density for co-polarized signals shall not exceed the following values, for all directions other than within ±3° of the GSO arc, under clear sky conditions:
<table>
<tr><td>21.5-25log(θ)-10log(N)</td><td>dBW/40kHz</td><td>for 3.5° ≤θ ≤7°</td></tr>
<tr><td>0.37-10log(N)</td><td>dBW/40kHz</td><td>for 7° <θ ≤9.23°</td></tr>
<tr><td>24.5-25log(θ)-10log(N)</td><td>dBW/40kHz</td><td>for 9.23° <θ ≤48°</td></tr>
<tr><td>−7.5-10log(N)</td><td>dBW/40kHz</td><td>for 48° <θ ≤180°</td></tr>
</table>
Where:<br>θ: is the angle in degrees from the axis of the main lobe; for systems where more than one earth station is expected to transmit simultaneously in the same bandwidth, e.g., CDMA systems.</td>
<td>(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:
<table>
<tr><td>35.5-25log(θ)-10log(N)</td><td>dBW/MHz</td><td>for 3.5° ≤θ ≤7°</td></tr>
<tr><td>14.35-10log(N)</td><td>dBW/MHz</td><td>for 7° <θ ≤9.23°</td></tr>
<tr><td>38.5-25log(θ)-10log(N)</td><td>dBW/MHz</td><td>for 9.23° <θ ≤48°</td></tr>
<tr><td>6.5-10log(N)</td><td>dBW/MHz</td><td>for 48° <θ ≤180°</td></tr>
</table>
where: θ and N are as defined in paragraph (a)(1) of this section.</td>
<td>(2) In the plane orthogonal to the local plane of 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:
<table>
<tr><td>35.5-25log(φ)</td><td>dBW/MHz</td><td>for 3.5° ≤φ ≤7°</td></tr>
<tr><td>14.35</td><td>dBW/MHz</td><td>for 7° <φ ≤9.23°</td></tr>
<tr><td>38.5-25log(φ)</td><td>dBW/MHz</td><td>for 9.23° < ~~19.1~~φ ≤~~48~~19.1°</td></tr>
<tr><td>6.5</td><td>dBW/MHz</td><td>for ~~48~~19.1° <φ ≤180°</td></tr>
</table>
where φ is the angle in degrees from the axis of the main lobe as measured in the plane orthogonal to the local plane of the GSO arc.</td>
<td>SIA supports 1MHz Reference BW, proposes the deletion of 10 log (N), and replacing this factor with a modified Section 25.138(a)(5); SIA supports the retention of the theta definition from current 25.138(a)(1) instead of FCC proposal and using φ and plane orthogonal to the local plane of the GSO arc.<br>SIA proposes to flatten the mask from 19.1 – 180°.</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>N: is the likely maximum number of simultaneously transmitting co-frequency earth stations in the receive beam of the satellite; N=1 for TDMA and FDMA systems.</td><td></td><td></td><td></td></tr>
<tr><td>F.12<br>(80)</td><td>25.138(a)(3)</td><td>(3) The values given in paragraphs (a) (1) and (2) of this section may be exceeded by 3 dB, for values of θ >10°, provided that the total angular range over which this occurs does not exceed 20° when measured along both sides of the GSO arc.</td><td>(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 θ >10°, over 10% of the range of theta (θ) angles from 10-180º on each side of the line from the earth station to the target satellite.</td><td>(3 The off-axis EIRP density mask in sections (a)(1) and (2) above, may be exceeded to the same extent allowed for the off-axis gain mask in 25.209(a)(3) and (4), respectively</td><td>SIA proposing consequential modification based upon combination of ITU Rec 732-1 and current values used in 25.209.</td></tr>
<tr><td>F.12<br>(80)</td><td>25.138(a)(4)</td><td>4) GSO FSS earth station antenna off-axis EIRP spectral density for cross-polarized signals shall not exceed the following values, in all directions relative to the GSO arc, under clear sky conditions:<br><table><tr><td>8.5-25log(θ)-10log(N)</td><td>dBW/40 kHz</td><td>For</td><td>2.0° <θ ≤7.0°</td></tr><tr><td>−12.63-10log(N)</td><td>dBW/40 kHz</td><td>For</td><td>7.0° <θ ≤9.23°</td></tr></table>where θ is the angle in degrees from the axis of the main lobe. For systems where more than one earth station is expected to transmit simultaneously in the same bandwidth, e.g., CDMA systems, N is the likely maximum number of simultaneously transmitting co-frequency earth stations in the receive beam of the satellite. N=1 for TDMA and FDMA systems.</td><td>(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:<br><table><tr><td>22.5-25log(θ)-10log(N)</td><td>dBW/MHz</td><td>For</td><td>2.0° <θ ≤7.0°</td></tr><tr><td>1.35-10log(N)</td><td>dBW/MHz</td><td>For</td><td>7.0° <θ ≤9.23°</td></tr></table>where θ and N are as defined in paragraph (a)(1) of this section.</td><td>(4) The EIRP density of cross-polarized signals will not exceed the following values:<br>(i) In the local plane of the GSO arc ~~or in the plane orthogonal to local plane of the GSO arc~~ under clear sky conditions:<br><table><tr><td>22.5-25log(θ)</td><td>dBW/MHz</td><td>For</td><td>2.0° <θ ≤7.0°</td></tr></table>where θ is as defined in paragraph (a)(1) of this section.<br>(ii) in the plane orthogonal to the local plane of the GSO under clear sky conditions:<br><table><tr><td>22.5-25log(φ)</td><td>dBW/MHz</td><td>For</td><td>2.0° <φ ≤7.0°</td></tr></table>where φ is defined in (a)(2) of this section.</td><td>SIA supports 1MHz reference and proposes deletion of 10Log(N)and retaining theta definition from current 25.138(a)(1) instead of FCC proposal. Also proposing φ for plane orthogonal to the local plane of the GSO arc.</td></tr>
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| F.7. (66 & 71) | 25.138(a)(5) SIA proposal | 5) [Reserved] | (5) A license application for a network using variable power-density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates the following:<br>(i) EIRP density from each station in the network will not exceed a level 1 dB below the levels specified in paragraphs (a)(1), (a)(2), and (a)(4) of this section, with the value of N=1.<br>(ii) Aggregate EIRP density toward any co-frequency space station other than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will not exceed the limit specified in paragraph (a)(5)(i) above. | (5) A license application for a network of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates aggregate EIRP density for 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 limit specified in paragraphs (a)(1),( a)(2) and (a)(4) of this section. | SIA opposes this FCC proposal. SIA proposes these modifications to address aggregate off-axis EIRP density. The SIA view is that the 1 dB of additional protection is not needed and proposed alternative text. See main section of comments for discussion. |
| F.19 (102) | 25.138(d) remove and reserve | (d)(1) Except as provided in paragraph (d)(2) of this section, the applicant must provide, for each earth station antenna type, a series of radiation patterns measured on a production antenna. The measurements must be performed on a calibrated antenna range and, at a minimum, must be made at the bottom, middle, and top frequencies of each requested uplink band. The radiation patterns are:<br>(i) Co-polarized patterns in the E- and H-planes for linear-polarized antennas or in two orthogonal | (d) reserved | | SIA agrees with FCC proposal |

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| | | planes for circularly-polarized antennas:<br>(A) In the azimuth plane, plus and minus 10 degrees and plus and minus 180 degrees from beam peak.<br>(B) In the elevation plane, 0 to 30 degrees.<br>(ii) Cross-polarization patterns in the E- and H-planes for linear-polarized antennas or in two orthogonal planes for circularly-polarized antennas, plus and minus 10 degrees from beam peak.<br>(iii) Main beam gain.<br>(2) For antennas more than 3 meters in diameter that will only be assembled on-site, on-site measurements may be submitted. If on-site data is to be submitted, the test frequencies and number of patterns should follow, where possible, the requirements in paragraph (d)(1) of this section for at least one frequency. Certification that the on-site testing has been satisfactorily performed must be included with the certification filed pursuant to §25.133(b). | | | |
| S. (170) | 25.138(e) remove and reserve | (e) Protection of downlink reception from adjacent satellite interference is based on either the antenna performance specified in §25.209 (a) and (b), or the actual receiving earth station antenna performance, if actual performance provides greater isolation from adjacent satellite interference. For | (e) reserved | | SIA agrees with FCC proposal |

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| | | purposes of ensuring the correct level of protection, the applicant must provide, for each earth station antenna type, antenna performance plots for the 18.3-18.8 GHz and 19.7-20.2 GHz bands in the format prescribed in paragraph (d) of this section. | | | |
| n/a | 25.138 (f) No change proposed | (f) The holder of a blanket license pursuant to this section will be responsible for operation of any transceiver to receive service provided by that licensee or provided by another party with the blanket licensee's consent. Space station operators may not transmit communications to or from user transceivers in the United States in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz, or 29.25-30.0 GHz band unless such communications are authorized under an FCC earth station license. | | (f) The holder of a blanket license pursuant to this section will be responsible for operation of any transceiver to receive service provided by that licensee or provided by another party with the blanket licensee's consent. Space station operators may not transmit communications to or from user transceivers in the United States in the conventional GSO Ka bands unless such communications are authorized under an FCC earth station license. | SIA proposes modification to use its definition of conventional GSO Ka band to replace the individual bands listed. |
| S. (171) | 25.138(g) remove | (g) A licensee applying for renewal of a license issued pursuant to this section must specify on FCC Form 312R the number of constructed earth stations. | | | SIA agrees with FCC proposal |
| C.3 (52) | 25.140(a)(1) mandatory coordination for analog video as result of deletion of 25.210(a) | (a) In addition to the information required by §25.114, applicants for geostationary-orbit FSS space stations must provide an interference analysis to demonstrate the compatibility of their proposed system with respect to authorized space stations within 2 degrees of any proposed satellite point of | (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 6 | | SIA agrees with FCC proposal |

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| | | communication. An applicant should provide details of its proposed radio frequency carriers which it believes should be taken into account in this analysis. At a minimum, the applicant 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.) | degrees of the requested orbit location. | | |
| | 25.140(b)(3) | (b)***<br>(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 provide an interference analysis of the kind described in paragraph (a) of this section, except that the applicant must demonstrate the compatibility of its proposed network with any current or future authorized space station in the 17/24 GHz BSS that complies with the technical rules in this part and that will be | (b) * * *<br>(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 provide an interference analysis demonstrating the compatibility of its proposed network with any current or future authorized space station in the 17/24 GHz BSS that complies with the technical rules in this part and will be located at least 4 degrees from the proposed space station. | (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, and will be located at least 4 degrees from a previously licensed or proposed space station.,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 stations will not exceed the EIRP density envelope in §25.223(c) unless the non-conforming uplink operation is coordinated with other affected systems in accordance with §25.223(c). | SIA proposes to modify this section to be consistent with other similar rules<br><br>See main section of comments for discussion. |

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| | | located at least four degrees from the proposed space station. | | | |
| I. (135) | 25.142(a)(5) remove- see 25.113 (g),(h) and (i) | (5) Replacement of space stations within the system license term. The licensee need not file separate applications to construct, launch and operate technically identical replacement satellites within the term of the system authorization. However, the licensee shall certify to the Commission, at least thirty days prior to launch of such replacement(s) that:<br>(i) The licensee intends to launch a space station that is technically identical to those authorized in its system license, and<br>(ii) Launch of this space station will not cause the licensee to exceed the total number of operating space stations authorized by the Commission. | Remove paragraph (a)(5) | | SIA agrees with FCC proposal |
| T.1. (172) | 25.143 (a) aligns with 25.114(a) | a) *System license.* Applicants authorized to construct and launch a system of technically identical satellites will be awarded a single "blanket" license. In the case of non-geostationary satellites, the blanket license will cover a specified number of space stations to operate in a specified number of orbital planes. In the case of geostationary satellites, as part of a geostationary-only satellite system or a geostationary/non-geostationary hybrid satellite system, an individual license will be issued | (a) Authority to launch and operate a constellation of NGSO satellites will be awarded 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. | | SIA agrees with FCC proposal |

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| | | for each satellite to be located at a geostationary orbital location. | | | |
| I. (135) | 25.143(c) remove (see 25.113 (g),(h) and (i)); replace with 25.143(f) | (c) *Replacement of Space Stations Within the System License Term.* Licensees of 1.6/2.4 GHz mobile-satellite systems authorized through a blanket license pursuant to paragraph (a) of this section need not file separate applications to construct, launch and operate technically identical replacement satellites within the term of the system authorization. However, the licensee shall certify to the Commission, at least thirty days prior to launch of such replacement(s) that:<br>(1) The licensee intends to launch a space station that is technically identical to those authorized in its system authorization, and<br>(2) Launch of this space station will not cause the licensee to exceed the total number of operating space stations authorized by the Commission. | (c) *Safety and distress communications.* (1) Stations operating in the 1.6/2.4 GHz Mobile-Satellite Service and 2 GHz Mobile-Satellite Service that are voluntarily installed on a U.S. ship or are used to comply with any statute or regulatory equipment carriage requirements may also be subject to the requirements of sections 321(b) and 359 of the Communications Act of 1934. Licensees are advised that these provisions give priority to radio communications or signals relating to ships in distress and prohibits a charge for the transmission of maritime distress calls and related traffic.<br><br>2) Licensees offering distress and safety services should coordinate with the appropriate search and rescue organizations responsible for the licensees service area. | | SIA agrees with FCC proposal |
| n/a | 25.143(f) redesignate as para (c) | (f) *Safety and distress communications.* (1) Stations operating in the 1.6/2.4 GHz Mobile-Satellite Service and 2 GHz Mobile-Satellite Service that are voluntarily installed on a U.S. ship or are used to comply with any statute or regulatory equipment carriage requirements may also be subject to the requirements of | | | SIA agrees with FCC proposal |

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| | | sections 321(b) and 359 of the Communications Act of 1934. Licensees are advised that these provisions give priority to radio communications or signals relating to ships in distress and prohibits a charge for the transmission of maritime distress calls and related traffic.<br><br>2) Licensees offering distress and safety services should coordinate with the appropriate search and rescue organizations responsible for the licensees service area. | | | |
| T.2. (173) | 25.145 title mod | §25.145 Licensing provisions for the Fixed-Satellite Service in the 20/30 GHz bands. | § 25.145 Licensing provisions for the Fixed-Satellite Service in the 18.3-20.2 GHz and 28.35-30.0 GHz bands. | | SIA agrees with FCC proposal |
| T.2. (173) | 25.145(e) | (e) Prohibition of certain agreements. No license shall be granted to any applicant for a space station in the Fixed-Satellite Service operating in the 20/30 GHz band 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 possession, 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 | (e) Prohibition of certain agreements. No license shall be granted to any applicant for a space station in the Fixed-Satellite Service 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 | | SIA agrees with FCC proposal |

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| | | companies controlling or controlled by the Licensee are parties. | controlling or controlled by the Licensee are parties. | | |
| T.2. (174) | 25.145(f) remove and reserve | (f)(1) [Reserved]<br>(2) Licensees shall submit to the Commission a yearly report indicating the number of earth stations actually brought into service under its blanket licensing authority. The annual report is due to the Commission no later than the first day of April of each year and shall indicate the deployment figures for the preceding calendar year. | (f) reserved | | SIA agrees with FCC proposal |
| I. (135) | 25.145(h) remove | (h) *Replacement of Space Stations within the System License Term.* Licensees of NGSO FSS systems in the 18.8-19.3 GHz and 28.6-29.1 GHz frequency bands authorized through a blanket license pursuant to paragraph (b) of this section need not file separate applications to launch and operate technically identical replacement satellites within the term of the system authorization. However, the licensee shall certify to the Commission, at least thirty days prior to launch of such replacement(s) that:<br>(1) The licensee intends to launch a space station into the previously-authorized orbit that is technically identical to those authorized in its system authorization and | | | SIA agrees with FCC proposal |

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| | | (2) Launch of this space station will not cause the license to exceed the total number of operating space stations authorized by the Commission. | | | |
| T.3. (175) | 25.146(a)(1) Corrects Rec S 1503 title | (a)***<br>(1) *Single-entry validation equivalent power flux-density, in the space-to-Earth direction, ($EPFD_{down}$) limits.* (i) Provide a set of power flux-density (PFD) masks, on the surface of the Earth, for each space station in the NGSO FSS system. 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-GSO FSS Networks with Limits Contained in Article 22 of the Radio Regulations." In particular, the PFD masks must encompass the power flux-density radiated by the space station regardless of the satellite transmitter power resource allocation and traffic/beam switching strategy that are used at different periods of a NGSO FSS system's life. The PFD masks shall also be in an electronic form that can be accessed by the computer program specified in paragraph (a)(1)(iii) of this section. | (a) * * *<br>(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." * * * | | SIA agrees with FCC proposal |

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| I. (135) | 25.146(m) remove | (m) Replacement of Space Stations within the System License Term. Licensees of NGSO FSS systems in the 10.7-12.7 GHz, 12.75-13.25 GHz and 13.75-14.5 GHz frequency bands authorized through a blanket license pursuant to paragraph (g) of this section need not file separate applications to launch and operate technically identical replacement satellites within the term of the system authorization. However, the licensee shall certify to the Commission, at least thirty days prior to launch of such replacement(s) that:<br>(1) The licensee intends to launch a space station into the previously-authorized orbit that is technically identical to those authorized in its system authorization and<br>(2) Launch of this space station will not cause the licensee to exceed the total number of operating space stations authorized by the Commission. | | | SIA agrees with FCC proposal |
| T.4. (175) | 25.147 remove move to subpart D Technical operations 25.288 | **§25.147 Licensing provision for NGSO MSS feeder downlinks in the band 6700-6875 MHz.**<br>If an NGSO MSS satellite transmitting in the band 6700-6875 MHz causes harmful interference to previously licensed co-frequency Public Safety facilities, then that satellite licensee is obligated to | reserve | | SIA agrees with FCC proposal |

<table>
<tr><td></td><td></td><td>remedy the interference complaint.</td><td></td><td></td><td></td></tr>
<tr><td>V. (183)</td><td>25.159(a) FCC seeks comment on removal</td><td>(a) Applicants with a total of five applications for GSO-like space station licenses on file with the Commission in a particular frequency band, or a total of five licensed-but-unbuilt GSO-like space stations in a particular frequency band, or a combination of pending GSO-like applications and licensed-but-unbuilt GSO-like space stations in a particular frequency band that equals five, will not be permitted to apply for another GSO-like space station license in that frequency band.</td><td></td><td>.</td><td>SIA agrees with FCC proposal</td></tr>
<tr><td>W. (184)</td><td>25.163(a)(3) “Insure” to “ensure”</td><td>(a)***<br>3) The petition sets forth with specificity the procedures which have been established to insure timely filings in the future.</td><td>(a) * * *<br>(3) The petition sets forth with specificity the procedures that have been established to ensure timely filings in the future.</td><td></td><td>SIA agrees with this FCC proposal</td></tr>
<tr><td>Technical Standards</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Y. (186)</td><td>25.202(a)(1)</td><td>(a)(1)***<br><table><tr><th>Space-to-earth (GHz)</th><th>Earth-to-space (GHz)</th></tr><tr><td>3.6-3.65</td><td>5.091-5.25</td></tr><tr><td>3.65-3.7</td><td>5.85-5.925</td></tr><tr><td>3.7-4.2</td><td>5.925-6.425</td></tr><tr><td>4.5-4.8</td><td>6.425-6.525</td></tr><tr><td>6.7-7.025</td><td>6.525-6.7</td></tr></table></td><td>(a) (1) * * *<br>list:<br><table><tr><th>Space-to-earth (GHz)</th><th>Earth-to-space (GHz)</th></tr><tr><td>3.6-3.65</td><td>5.091-5.25 [8]</td></tr><tr><td>3.65-3.7</td><td>5.85-5.925</td></tr><tr><td>3.7-4.2</td><td>5.925-6.425</td></tr><tr><td>4.5-4.8</td><td>6.425-6.525</td></tr></table></td><td></td><td>SIA agrees with FCC proposal</td></tr>
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| | | 7.025-7.075 / 6.7-7.025<br>10.7-11.7 / 7.025-7.075<br>11.7-12.2 / 12.7-12.75<br>12.2-12.7 / 12.75-13.25<br>18.3-18.58[1 2] / 13.75-14<br>18.58-18.8 / 14-14.2<br>18.8-19.3 / 14.2-14.5<br>19.3-19.7 / 15.43-15.63<br>19.7-20.2 / 17.3-17.8<br>37.5-40[3] / 24.75-25.05<br>40-42 / 25.05-25.25<br>[2]27.5-28.35<br>[4]28.35-28.6<br>[5]28.6-29.1<br>[6]29.1-29.25<br>[7]29.25-29.5<br>[4]29.5-30.0<br>47.2-50.2 | 6.7-7.025 [8] / 6.525-6.7<br>7.025-7.075 / 6.7-7.025<br>10.7-11.7 [8] / 7.025-7.075<br>11.7-12.2 / 12.7-12.75<br>12.2-12.7 / 12.75-13.25 [8]<br>18.3-18.58 [1 2] / 13.75-14<br>18.58-18.8 / 14-14.2<br>18.8-19.3 / 14.2-14.5<br>19.3-19.7 / 15.43-15.63 [8]<br>19.7-20.2 / 17.3-17.8<br>37.5-40 [3] / 24.75-25.05<br>40-42 / 25.05-25.25<br>27.5-28.35 [2]<br>28.35-28.6 [4]<br>28.6-29.1[5]<br>29.1-29.25 [6]<br>29.25-29.5 [7]<br>29.5-30.0 [4]<br>47.2-50.2 | | |
| Y. (186) | 25.202(a)(1) Note 1 | [1]The 18.3-18.58 GHz band is shared co-equally with existing terrestrial radiocommunication systems until November 19, 2012. | [1]The 18.3-18.58 GHz band is shared co-equally with existing terrestrial radiocommunication systems until November 19, 2012. | | FCC proposal is no change |
| Y. (186) | 25.202(a)(1) Note 2 | [2]FSS is secondary to LMDS in this band. | [2]FSS is secondary to LMDS in this band. | | FCC proposal is no change |
| Y. (186) | 25.202(a)(1) note 3 | [3]Use of this band by the Fixed-Satellite Service is limited to gateway earth station | [3]Use of this band by the Fixed-Satellite Service is limited to gateway earth station operations, | | FCC proposal is no change |

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| | | 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. | 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. | | |
| Y. (186) | 25.202(a)(1) Note 4 | [4]This band is primary for GSO FSS and secondary for NGSO FSS | [4]This band is primary for GSO FSS and secondary for NGSO FSS. | | FCC proposal is no change |
| Y. (186) | 25.202(a)(1) Note 5 | [5]This band is primary for NGSO FSS and secondary for GSO FSS. | [5]This band is primary for NGSO FSS and secondary for GSO FSS. | | FCC proposal is no change |
| Y.(186) | 25.202(a)(1) note 6 | [6]This band is primary for MSS feeder links and LMDS hub-to-subscriber transmission. | [6]This band is primary for MSS feeder links and LMDS hub-to-subscriber transmission. | [6]This band is primary for NGSO MSS feeder links and LMDS hub-to-subscriber transmission. | SIA proposes to limit to NGSO MSS feeder links consistent with Ka band plan |
| Y.(186) | 25.202(a)(1) note 7 | [7]This band is primary for MSS feeder links and GSO FSS. | [7]This band is primary for MSS feeder links and GSO FSS. | [7]This band is primary for NGSO MSS feeder links and GSO FSS. | SIA proposes to limit to NGSO MSS feeder links consistent with Ka band plan |
| Y. (186) | 25.202(a)(1) note 8 add | | [8]Use of this band by NGSO FSS systems is limited to transmissions to or from gateway earth stations. | | SIA agrees with this FCC proposal |
| n/a188 | 25.203(c)(6) add | | (c) * * *<br>(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. | | SIA agrees with FCC proposal |

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| Z. (188) | 25.203(f) mod 1st sentence Exempts receive only licensees | (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 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. Such notification shall include the geographical coordinates of the antenna, antenna height, antenna directivity if any, proposed frequency, type of emission, and power. In addition, the applicant shall indicate in his application to the Commission the date notification was made to the observatory. | (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. * * * | | SIA agrees with FCC proposal |

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| | | After receipt of such applications, the Commission will allow a period of 20 days for comments or objections in response to the notifications indicated. If an objection to the proposed operation is received during the 20-day period from the National Radio Astronomy Observatory for itself or on behalf of the Naval Radio Research Observatory, the Commission will consider all aspects of the problem and take whatever action is deemed appropriate. | | | |
| Z. (189) | 25.203(g)(1) mod Deletes free space characteristics impedance | (g)***<br>(1) Applicants in the vicinity of an FCC monitoring station for a radio station authorization to operate new transmitting facilities or changed transmitting facilities which would increase the field strength produced over the monitoring station over that previously authorized are advised to give consideration, prior to filing applications, to the possible need to protect the FCC stations from harmful interference. Geographical coordinates of the facilities which require protection are listed in §0.121(c) of the Commission's Rules. Applications for stations (except mobile stations) which will produce on any frequency a direct wave fundamental field strength of *greater than 10 mV/m* in the | (g) * * *<br>(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 the Commission's Rules. Applications for fixed stations that will produce field strength greater than 10 mV/m or power flux density greater than −65.8 dBW/m$^2$ in the authorized emission bandwidth at any of the referenced coordinates may be examined to determine the extent of possible interference. | | SIA agrees with FCC proposal |

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| | | authorized bandwidth of service (−65.8 dBW/m2 power flux density assuming a free space characteristic impedance of 120 ohms) at the referenced coordinates, may be examined to determine 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 indicated coordinates, a clause protecting the monitoring station may be added to the station authorization. | 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. | | |
| Z. (190) | 25.203(j) mod Deletes requirement for MSS feeder links specify frequencies and gain contours as redundant with25.114(c) | j) Applicants for non-geostationary 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 shall indicate the frequencies and spacecraft antenna gain contours towards each feeder-link earth station location and will coordinate with licensees of other Fixed-Satellite Service and terrestrial-service systems sharing the band to determine geographic protection areas around each non-geostationary Mobile-Satellite Service/Radiodetermination-Satellite Service feeder-link earth station. | (j) Applicants for non-geostationary 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 Fixed-Satellite Service and terrestrial-service systems sharing the band to determine geographic protection areas around each non-geostationary Mobile-Satellite Service/Radiodetermination-Satellite Service feeder-link earth station. | | SIA agrees with FCC proposal. |
| AA.1. (191) | 25.204(e)(1) 1 db limit obviates need for | (e)***<br><br>(1) Except when paragraphs (e)(2) through (e)(4) of this | (e)***<br><br>(1) Except when paragraphs (e)(2) through (e)(4) of this section apply, | | SIA agrees with FCC proposal |

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| | coordination-deletes coordination requirement | section apply, transmissions from FSS earth stations in frequencies above 10 GHz may exceed the uplink EIRP and EIRP density limits specified in the station authorization under conditions of uplink fading due to precipitation by an amount not to exceed 1 dB above the actual amount of monitored excess attenuation over clear sky propagation conditions. EIRP levels must be returned to normal as soon as the attenuating weather pattern subsides. The maximum power level for power control purposes must be coordinated with adjacent satellite operators. | transmissions from FSS earth stations in frequencies above 10 GHz may exceed the uplink EIRP and EIRP density limits specified in the station authorization under conditions of uplink fading due to precipitation by an amount not to exceed 1 dB above the actual amount of monitored excess attenuation over clear sky propagation conditions. EIRP levels must be returned to normal as soon as the attenuating weather pattern subsides. | | |
| AA.2. (192) | 25.205 title mod | §25.205 Minimum angle of antenna elevation. | <u>§ 25.205 Minimum antenna elevation angle.</u> | | SIA agrees with FCC proposal. |
| AA.2. (192) | 25.205(a) Permits routine authorization down to 3°elevation angles in bands not shared with terrestrial | (a) Earth station antennas shall not normally be authorized for transmission at angles less than 5° measured from the horizontal plane to the direction of maximum radiation. However, upon a showing that the transmission path will be seaward and away from land masses or upon special showing of need for lower angles by the applicant, the Commission will consider authorizing transmissions at angles between 3° and 5° in the pertinent directions. In certain instances, it may be necessary to specify minimum angles greater than 5° | (a) Earth station antennas may not transmit at elevation angles less than 5 degrees, measured from the horizontal plane to the direction of maximum radiation, in a frequency band shared with terrestrial radio services or at elevation angles less than 3 degrees in other frequency bands. In some instances, it may be necessary to specify greater minimum elevation angles because of interference considerations. | | SIA agrees with FCC proposal. |

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| | | because of interference considerations. | | | |
| AA.2. (193) | 25.205(b) remove Redundant with 25.204(h),(i) &(j) | (b) ESVs making a special showing requesting angles of elevation less than 5° measured from the horizontal plane to the direction of maximum radiation pursuant to (a) of this Section must still meet the effective isotropically radiated power (e.i.r.p.) and e.i.r.p. density towards the horizon limits contained in §25.204(h) and (i). | | | SIA agrees with FCC proposal |
| AA.2. (193) | 25.205(c) remove Redundant with 25.204(h),(i) &(j) | (c) VMESs making a special showing requesting angles of elevation less than 5° measured from the horizontal plane to the direction of maximum radiation pursuant to (a) of this section must still meet the EIRP and EIRP density towards the horizon limits contained in §25.204(j). | | | SIA agrees with FCC proposal. |
| AA.2. (193) | 25.205(d) mod and redesignate as (b) | (d) While on the ground, ESAAs shall not be authorized for transmission at angles less than 5° measured from the plane of the horizon to the direction of maximum radiation. While in flight there is no minimum angle of antenna elevation | (b) ESAAs in aircraft on the ground may not transmit at elevation angles less than 3 degrees. There is no minimum angle of antenna elevation for ESAAs while airborne. | | SIA agrees with FCC proposal. |
| | 25.209 | §25.209 Earth station antenna performance standards. | <u>§ 25.209 Earth station antenna performance standards.</u> | | See main section of comments for discussion of SIA proposals for Section 25.209. |
| F.18 (93) | 25.209(a) | (a) Except as provided in paragraph (f) of this section, the gain of any antenna to be employed in transmission from an earth station in the Fixed-Satellite Service shall lie below | (a) Except as provided in paragraph (f) of this section, the gain of any earth station antenna operating in the Fixed-Satellite Service, including earth stations providing feeder links | (a) Except as provided in paragraph (f) of this section, the gain of any antenna to be employed in transmission from a GSO earth station in the Fixed-Satellite Service, including earth stations providing feeder links for satellite services other than FSS, shall lie below | SIA agrees with FCC proposal but recommends adding a reference to GSO to clarify the |

<table>
<tr><td></td><td></td><td>the relevant envelope defined in paragraphs (a)(1) through (4) of this section:</td><td>for satellite services other than FSS, may not exceed the following limits:</td><td>the relevant envelope defined in paragraphs (a)(1) and (2) of this section:</td><td>applicability of these provisions.</td></tr>
<tr><td>F.2 (59)<br>F.3 (60)<br>F.18<br>(92)</td><td>25.209(a)(1)</td><td>(1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location, for earth stations not operating in the 20/30 GHz band or conventional Ku-band:
<table>
<tr><td>29-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>8</td><td>dBi</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>−10</td><td>dBi</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator. For the purposes of this section, the peak gain of an individual sidelobe may not exceed the envelope defined above for θ between 1.5 and 7.0 degrees. For θ greater than 7.0 degrees, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the gain envelope given above by more than 3 dB.</td><td>(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 28.35-30 GHz band, or the 24.75-25.25 GHz band:
<table>
<tr><td>29-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>8</td><td>dBi</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>9.2° < θ ≤48°</td></tr>
<tr><td>−10</td><td>dBi</td><td>for</td><td>48° < θ ≤180°</td></tr>
</table>
where θ is the angle in degrees from a line from the focal point of the antenna to 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 θ angles from ±7-180º.</td><td>(1) In the main plane of the antenna:
<table>
<tr><td>29-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>ψ≤θ ≤7°</td></tr>
<tr><td>8</td><td>dBi</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>0</td><td>dBi</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator.<br>ψ is equal to 1.5° for the C bands, 1.5° for the Ku bands and 2° for the Ka bands. For the purposes of this rule:<br>The C Bands include the conventional C band, the Extended C band ~~and any FSS bands not included in the Ku bands and the Ka bands;~~<br>The Ku bands include the conventional Ku band and the Extended Ku band;<br>The Ka Bands include the conventional GSO Ka Bands and 24.75-25.25 GHz.<br>The main plane of an earth station antenna is considered to be a plane that passes through the minimum antenna beam width.<br>For the purposes of this section, the envelope above may be exceeded to the extent specified in (a)(3) of this section.</td><td>See main section of comments for discussion. SIA proposes :<br>(1) “plane tangent to GSO” be revised to “main plane of the antenna” as this should be clearer for antenna manufactures and will cover circular, elliptical and flat-panel antenna shapes/designs<br>(2) “target satellite” be removed because pointing error is handled between operators<br>(3) envelop excess revised to follow combination of ITU-R Recommendation S.732-1 and current values and is inserted below as new (a)(3)</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td>(4) the starting angle is proposed to remain the same for C, Ku (1.5°) and Ka (2°) bands as it is today.</td></tr>
<tr><td>F.2 (59)<br>F.3 (60)<br>F.18<br>(92)</td><td>25.209(a)(2)</td><td>2) In the plane of the geostationary satellite orbit as it appears at the particular earth station location, for earth stations operating in the 20/30 GHz band or conventional Ku-band:<br><table><tr><td>29-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr><tr><td>8</td><td>dBi</td><td>For</td><td>7° <θ ≤9.2°</td></tr><tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>9.2° <θ ≤48°</td></tr><tr><td>−10</td><td>dBi</td><td>For</td><td>48° <θ ≤85°</td></tr><tr><td>0</td><td>dBi</td><td>For</td><td>85° <θ ≤180°</td></tr></table></td><td>(2) In the plane tangent to the GSO arc, for earth stations operating in the conventional Ku-band:<br><table><tr><td>29-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>1.5° ≤ θ ≤7°</td></tr><tr><td>8</td><td>dBi</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr><tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>9.2° < θ ≤48°</td></tr><tr><td>−10</td><td>dBi</td><td>for</td><td>48° < θ ≤85°</td></tr><tr><td>0</td><td>dBi</td><td>for</td><td>85° < θ ≤180°</td></tr></table>where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 3 dB in 10% of the range of θ angles from ±7-180º.</td><td>delete</td><td>Addressed by SIA proposal for revised (a)(1).</td></tr>
<tr><td>F.12<br>(81)<br>F.13<br>(82)</td><td>25.209(a)(3)<br>add</td><td></td><td>(3) In the plane tangent to the GSO arc, for earth stations operating in the 28.35-30 GHz or 24.75-25.25 GHz band:<br><table><tr><td>29-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>2° ≤ θ ≤7°</td></tr><tr><td>8</td><td>dBi</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr><tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>9.2° < θ ≤ 48°</td></tr><tr><td>0</td><td>dBi</td><td>for</td><td>48° < θ ≤ 180°</td></tr></table>where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 3 dB in 10% of the range of θ angles from ±7-180º.</td><td>delete</td><td>Addressed by SIA proposal for revised (a)(1).</td></tr>
</table>

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<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr>
<td>F.4 (61)</td>
<td>25.209(a)(4)</td>
<td>(3) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths, for all earth stations not operating in the 20/30 GHz band or conventional Ku-band: Outside the main beam, the gain of the antenna shall lie below the envelope defined by:
<table>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>3° <θ ≤48°</td></tr>
<tr><td>−10</td><td>dBi</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ and dBi are defined above. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the gain envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.</td>
<td>(4) In the plane perpendicular to the GSO arc, as defined in § 25.103, for earth stations not operating in the conventional Ku-band, 28.35-30 GHz band, or 24.75-25.25 GHz band: Outside the main beam, the gain of the antenna shall lie below the envelope defined by:
<table>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>3° < θ ≤ 48°</td></tr>
<tr><td>−10</td><td>dBi</td><td>for</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of θ angles from ±3-180º.</td>
<td>delete</td>
<td>Addressed by SIA proposal for revised (a)(~~2~~1).</td>
</tr>
<tr>
<td>F.4 (61)<br>F.18<br>(92)</td>
<td>25.209(a)(5)<br>SIA proposal</td>
<td>(4) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths, for all earth stations operating in the 20/30 GHz band or conventional Ku-band: Outside the main beam, the gain of the antenna shall lie below the envelope defined by:
<table>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>3° <θ ≤48°</td></tr>
</table></td>
<td>(5) In the plane perpendicular to the GSO arc, for earth stations operating in the conventional Ku-band:<br>Outside the main beam, the gain of the antenna shall lie below the envelope defined by:
<table>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>3° < θ ≤ 48°</td></tr>
<tr><td>−10</td><td>dBi</td><td>for</td><td>48° < θ ≤ 85°</td></tr>
</table></td>
<td>(2) In the plane orthogonal to the main plane of the antenna, for all earth stations:
<table>
<tr><td>32-25log$_{10}$ φ</td><td>dBi</td><td>For</td><td>3° <φ ≤48°</td></tr>
<tr><td>0</td><td>dBi</td><td>For</td><td>48° <φ ≤180°</td></tr>
</table>
Where φ is the angle in degrees from the axis of the main lobe, and dBi is as defined above. For the purposes of this section, the envelope may be exceeded to the extent specified in (a)(4) of this section.</td>
<td>(1) SIA proposes to use φ alternatively to θ to clearly indicate they are two separate angular measurements. SIA proposes “plane orthogonal to main plane of the antenna” for</td>
</tr>
</table>

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<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>−10</td><td>dBi</td><td>For</td><td>48° <θ ≤85°</td></tr>
<tr><td>0</td><td>dBi</td><td>For</td><td>85° <θ ≤180°</td></tr>
</table>
where θ and dBi are defined above. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the gain envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.
</td>
<td>
<table>
<tr><td>0</td><td>dBi</td><td>for</td><td>85° < θ ≤ 180°</td></tr>
</table>
where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of θ angles from ±3-180º.
</td>
<td></td>
<td>“plane perpendicular to the GSO Arc.”</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td>
(3) While assessing antenna measurement data for compliance, the off axis gain may exceed the mask in the main plane by the “allowed excess” value listed below over 10% of the angular range given in the table for each of the “angular limits” ranges specified
<table>
<tr><th>Angular limits (°)</th><th>Angular range (°)</th><th>Allowed excess (dB)</th></tr>
<tr><td>ψ < θ ≤ 7</td><td>5.5 (C, Ku bands)<br>5(Ka bands)</td><td>1</td></tr>
<tr><td>7 <θ ≤ 9.2</td><td>2.2</td><td>3</td></tr>
<tr><td>9.2 <θ ≤ 48</td><td>9.9</td><td>3</td></tr>
<tr><td>48 <θ ≤ 180</td><td>132</td><td>10</td></tr>
</table>
Where ψ , θ and dBi are defined in (a)(1) of this section.
</td>
<td>SIA proposes that envelope excess be revised to follow combination of ITU-R Recommendation S.732-1 and current values in the main plane</td>
</tr>
</table>

<table>
<tr>
<td>n/a</td>
<td>25.209(a)(5) current rule moved to 25.132 (b)(1)(iv)?</td>
<td>(5) Elliptical earth station antennas may be operated only when the major axis of the antenna is aligned with the plane of the geostationary satellite orbit as it appears at the particular earth station location.</td>
<td></td>
<td>(4) While assessing antenna measurement data for compliance, the off axis gain may exceed the mask in the plane orthogonal to the main plane by the “allowed excess” value listed below over 10% of the “angular range” given in the table for each of the “angular limits” ranges specified..
<table>
<tr><th>Angular limits (°)</th><th>Angular range (°)</th><th>Allowed excess (dB)</th></tr>
<tr><td>3 < φ ≤ 48</td><td>45</td><td>6</td></tr>
<tr><td>48 < φ ≤ 180</td><td>132</td><td>10</td></tr>
</table>
Where φ and dBi are defined in (a)(2) of this section</td>
<td>SIA proposes that envelope excess be revised to follow combination of ITU-R Recommendation S.732-1 and current values for the plane orthogonal to the main plane</td>
</tr>
<tr>
<td>F.4 (61)<br>F.13<br>(82)<br>F.18<br>(92)</td>
<td>25.209(a)(6)</td>
<td></td>
<td>(6) In the plane perpendicular to the GSO arc, for earth stations operating in the 28.35-30 GHz band or 24.75-25.25 GHz band: Outside the main beam, the gain of the antenna shall lie below the envelope defined by:
<table>
<tr><td>32-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>3.5° < θ ≤ 7°</td></tr>
<tr><td>10.9</td><td>dBi</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>35-25log$_{10}$θ</td><td>dBi</td><td>for</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>3</td><td>dBi</td><td>for</td><td>48º < θ ≤ 180°</td></tr>
</table>
where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of θ angles from ±3-180º.</td>
<td>delete</td>
<td>Addressed by SIA proposal for revised (a)(2) above</td>
</tr>
<tr>
<td>F.18<br>(92)</td>
<td>25.209(b)<br>SIA proposal</td>
<td>(b) Except as provided in paragraph (f) of this section, the off-axis cross-polarization gain of any antenna to</td>
<td>(b) Except as provided in paragraph (f) of this section, the off-axis cross-polarization gain of</td>
<td>(b) Except as provided in paragraph (f) of this section, the off-axis cross-polarization gain of any antenna to be employed in transmission from an</td>
<td>SIA proposes to limit cross</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>be employed in transmission from an earth station to a space station in the Fixed-Satellite Service shall be defined as follows:</td><td>any antenna used for transmission from an FSS earth station, including earth stations providing feeder links for satellite services other than FSS, may not exceed the following limits:</td><td>earth station to a space station in the Fixed-Satellite Service, including earth stations providing feeder links for satellite services other than FSS, shall be defined as follows:</td><td>polarization to 7° or less.</td></tr>
<tr><td>F.18<br>(92)</td><td>25.209(b)(1)<br><br>SIA proposal</td><td>(1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:<table><tr><td>19-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>1.8° <θ ≤7°</td></tr><tr><td>−2</td><td>dBi</td><td>For</td><td>7° <θ ≤9.2°</td></tr></table>where θ is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator.</td><td>(1) In the plane tangent to the GSO arc, for earth stations not operating in the 28.35-30 GHz band or the 24.75-25.25 GHz band:<table><tr><td>19-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>1.8° < θ ≤ 7°</td></tr><tr><td>−2</td><td>dBi</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr></table>where θ and dBi are as defined in paragraph (a)(1) above.</td><td>(1) In the main plane of the antenna of the earth station:<table><tr><td>19-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>1.8° <θ ≤7°</td></tr></table>where θ is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator.</td><td>SIA proposes to limit cross polarization to 7° or less and use main plane of antenna of the earth station.</td></tr>
<tr><td>F.18<br>(92)</td><td>25.209(b)(2)<br>SIA proposal</td><td>2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:<table><tr><td>19-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>3° <θ ≤7°</td></tr><tr><td>−2</td><td>dBi</td><td>For</td><td>7° <θ ≤9.2°</td></tr></table>where θ and dBi are defined above.</td><td>(2) In the plane perpendicular to the GSO arc, for earth stations not operating in the 28.35-30 GHz band or the 24.75-25.25 GHz band:<table><tr><td>19-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>3° < θ ≤ 7°</td></tr><tr><td>−2</td><td>dBi</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr></table>where θ and dBi are as defined in paragraph (a)(1) above.</td><td>(2) In the plane orthogonal to the main plane of the antenna of the earth station<table><tr><td>19-25log$_{10}$ φ</td><td>dBi</td><td>For</td><td>3° <φ ≤7°</td></tr></table>where φ is the angle in degrees from the axis of the main lobe and dBi refers to dB relative to an isotropic radiator.</td><td>SIA ~~A~~proposes to limit cross polarization to 7° or less and use plane orthogonal to main plane of the antenna.</td></tr>
<tr><td>F.18<br>(92)</td><td>25.209(b)(3)</td><td></td><td>(3) In the plane perpendicular to the GSO arc, for earth stations operating in the 28.35-30 GHz band or 24.75-25.25 GHz band:<table><tr><td>19-25log$_{10}$θ</td><td>dBi</td><td>For</td><td>2° < θ ≤ 7°</td></tr><tr><td>−2</td><td>dBi</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr></table></td><td>delete</td><td>See SIA proposal above</td></tr>
</table>

| | | | | | |
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| | | | where θ and dBi are as defined in paragraph (a)(1) above. | | |
| F.18 (99) | 25.209(c)(1) | (c)(1) Earth station antennas licensed for reception of radio transmissions from a space station in the Fixed-Satellite Service are protected from radio interference caused by other space stations only to the degree to which harmful interference would not be expected to be caused to an earth station employing an antenna conforming to the referenced patterns defined in paragraphs (a) and (b) of this section, and protected from radio interference caused by terrestrial radio transmitters identified by the frequency coordination process only to the degree to which harmful interference would not be expected to be caused to an earth station conforming to the reference pattern defined in paragraphs (a)(3) and (4) 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 § 25.209(a) and (b). | | SIA agrees with FCC proposal |

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| F.18 (99) | 25.209(c)(2) | (2) 17/24 GHz BSS telemetry earth stations are protected from harmful interference caused by other space stations to the extent set forth in paragraph (c)(1) of this section. Receive-only earth stations in the 17/24 GHz BSS are protected from harmful interference caused by other space stations to the extent set forth in §25.224 of this part. | (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.<br>* * * * * | | SIA agrees with FCC proposal |
| | 25.209(d) | reserved | | (d) NGSO FSS earth stations operating on a primary basis, including NGSO FSS earth stations that serve as feeder links for non-FSS systems ~~and fixed earth stations that do not operate in the FSS~~, but excluding NGSO FSS earth stations operating in the bands listed in (h) below, must demonstrate compliance in two orthogonal planes with the gain masks specified in (a)(2) and (b)(2) above. | SIA proposes to clarify the specific antenna performance requirements for NGSO FSS earth stations operating on a primary basis. |
| F.18 (100) | 25.209(e) remove and reserve | (e) The operations of any earth station with an antenna not conforming to the standards of paragraphs (a) and (b) of this section shall impose no limitations upon the operation, location or design of any terrestrial station, any other earth station, or any space station beyond those limitations that would be expected to be | reserved | (e)An earth stations using asymmetrical antennas without skew angle adjustment capability must demonstrate compliance with 25.209(a)(1) in the plane orthogonal to the main plane of the antenna, or, alternatively, in the plane corresponding to the maximum skew angle experienced within the service area of the earth station. | SIA proposal addresses asymmetrical antennas |

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| | | imposed by an earth station employing an antenna conforming to the reference patterns defined in paragraphs (a) and (b) of this section. | | | |
| App. C (2) | 25.209(f) replace "procedures" with "requirements" | (f) An earth station with an antenna not conforming to relevant 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. For ESVs in the C-band, this demonstration must comply with the procedures set forth in §25.221. For ESVs in the Ku-band, this demonstration must comply with the procedures set forth in §25.222. For VMES, this demonstration shall comply with the procedures set forth in §25.226. For ESAAs, this demonstration shall comply with the procedures set forth in §25.227. For feeder-link earth stations in the 17/24 GHz BSS, this demonstration must comply with the procedures set forth in §25.223. For other FSS earth stations, this demonstration must comply with the requirements in §25.138, §25.218, or §25.220. In any case, the Commission will impose appropriate terms and conditions in its authorization of such facilities and operations. | (f) An earth station with an antenna not conforming to relevant 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. For ESVs in the C-band, this demonstration must comply with the requirements set forth in §25.221. For ESVs in the Ku-band, this demonstration must comply with the requirements set forth in §25.222. For VMES, this demonstration shall comply with the requirements set forth in §25.226. For ESAAs, this demonstration shall comply with the requirements set forth in §25.227. For feeder-link earth stations in the 17/24 GHz BSS, this demonstration must comply with the requirements set forth in §25.223. For other FSS earth stations, this demonstration must comply with the requirements in §25.138, §25.218, or §25.220. In any case, the Commission will impose appropriate terms and conditions in its authorization of such facilities and operations | (f) An earth station with an antenna not conforming to relevant 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. For ESVs in the C-band, this demonstration must comply with the requirements set forth in §25.221. For ESVs in the Ku-band, this demonstration must comply with the requirements set forth in §25.222. For VMES, this demonstration shall comply with the requirements set forth in §25.226. For ESAAs, this demonstration shall comply with the requirements set forth in §25.227. For feeder-link earth stations in the 17/24 GHz BSS, this demonstration must comply with the requirements set forth in §25.223. For other FSS earth stations, this demonstration must comply with the requirements in §25.138, §25.218, or §25.220as appropriate. In any case, the Commission will impose appropriate terms and conditions in its authorization of such facilities and operations | SIA agrees with FCC proposal to replace the term "procedures" with "requirements" and proposes inserting the term "as appropriate" after 25.220(d) as a clarification. |
| F.18 (101) | 25.209(h) added 3db | h)(1) The gain of any transmitting gateway earth station antenna operating in the 10.7-11.7 GHz, | (h) The gain of any transmitting antenna in a gateway earth station communicating with | (h) The gain of any transmitting gateway earth station antenna communicating with NGSO FSS satellites in the 10.7-11.7 GHz, 12.75-13.15 GHz, | SIA agrees with FCC proposal with a |

<table>
<tr>
<td></td>
<td>exceedance allowance</td>
<td>12.75-13.15 GHz, 13.2125-13.25 GHz, 13.8-14.0 GHz, and 14.4-14.5 GHz bands and communicating with NGSO FSS satellites must lie below the envelope defined as follows:<br>29-25log$_{10}$(&thgr;) dBi for 1° ≤ &thgr; ≤ 36°<br>-10 dBi for 36° < &thgr; ≤ 180°<br>Where:<br>&thgr; is the angle in degrees from the axis of the main lobe, and dBi means dB relative to an isotropic radiator.<br>(2) For the purposes of this section, the peak gain of an individual sidelobe may not exceed the envelope defined in paragraph (h)(1) of this section.</td>
<td>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:
<table>
<tr><td>29-25log$_{10}$(θ)</td><td>dBi</td><td>for</td><td>1° ≤ θ ≤ 36°</td></tr>
<tr><td>-10</td><td>dBi</td><td>for</td><td>36° ≤ θ ≤ 180°</td></tr>
</table>
where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 3 dB in 10% of the range of θ angles from ±7-180º.</td>
<td>13.2125-13.25 GHz, 13.8-14.0 GHz, and 14.4-14.5 GHz bands must lie below the envelope defined as follows:
<table>
<tr><td>29-25log$_{10}$(θ)</td><td>dBi</td><td>for</td><td>1° ≤ θ ≤ 36°</td></tr>
<tr><td>-10</td><td>dBi</td><td>for</td><td>36° ≤ θ ≤ 180°</td></tr>
</table>
Where:<br>θ is the angle in degrees from the axis of the main lobe, and dBi means dB relative to an isotropic radiator. The envelope may be exceeded by up to 3dB in 10% of the range of theta (θ) angles from +/- 7- 180°.</td>
<td>clarification regarding theta.</td>
</tr>
<tr>
<td>T.6. (180)</td>
<td>25.210(a) remove and reserve</td>
<td>(a) All space stations in the Fixed-Satellite Service used for domestic service in the 3700-4200 MHz and 5925-6425 MHz frequency bands shall:<br>(1) Use orthogonal linear polarization with one of the planes defined by the equatorial plane;<br>(2) Be designed so that the polarization sense of uplink transmissions is opposite to that of downlink transmissions on the same transponder; and<br>(3) Shall be capable of switching polarization sense upon ground command.</td>
<td>(a) [Reserved]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AA.3. (195)</td>
<td>25.211 (a) remove and reserve</td>
<td>a) Downlink analog video transmissions in the band 3700-4200 MHz shall be transmitted only on a center frequency of 3700+20N MHz, where N=1 to 24. The</td>
<td>(a) [Reserved]</td>
<td></td>
<td>SIA agrees with FCC proposal</td>
</tr>
</table>

| | | | | | |
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| | | corresponding uplink frequency shall be 2225 MHz higher. | | | |
| AA.3 (196) | 25.211(b) reworded and deleted last 2 sentences; moves unmodulated carrier text to 25.275 | (b) All 4/6 GHz analog video transmissions shall 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. Further, all transmissions operating in frequency bands described in §25.208 (b) and (c) shall 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. The transmission of an unmodulated carrier at a power level sufficient to saturate a transponder is prohibited, except by the space station licensee to determine transponder performance characteristics. All 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. | (b) All 4/6 GHz analog video transmissions shall 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) shall 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.<br>* * * * * | | SIA agrees with FCC proposal |

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| F.9. (76) | 25.211(d) FCC invites comment on Deletion of full transponder | (d) An earth station may be routinely licensed for transmission of full-transponder analog video services in the 5925-6425 MHz band or 14.0-14.5 GHz band provided:<br>(1) The application includes certification, pursuant to §25.132(a)(1), of conformance with the antenna performance standards in §25.209(a) and (b);<br>(2) An antenna with an equivalent diameter of 4.5 meters or greater will be used for such transmission in the 5925-6425 MHz band, and the input power into the antenna will not exceed 26.5 dBW;<br>(3) An antenna with an equivalent diameter of 1.2 meters or greater will be used for such transmission in the 14.0-14.5 GHz band, and the input power into the antenna will not exceed 27 dBW. | | | SIA agrees with deleting the term " full transponder" in 25.211(d) |
| F.14. (88) | 25.211(e) eliminates frequency bands | e) Applications for authority for analog video uplink transmission in the Fixed-Satellite Service not eligible for routine licensing under paragraph (d) of this section are subject to the provisions of §25.220. | (e) Applications for authority for analog video uplink transmission in the 5925-6425 MHz or 14.0-14.5 GHz band that are not eligible for routine processing under paragraph (d) of this section are subject to the requirements of § 25.220. | | SIA agrees with FCC proposal |
| | 25.212(c)(1) | | (c)(1) An earth station that is not subject to licensing under § 25.134, § 25.222, § 25.226, or § 25.227 may be routinely licensed for analog transmissions in the 14.0-14.5 GHz band with bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) if the | (c)(1) An earth station that is not subject to licensing under ~~§ 25.134~~, § 25.222, § 25.226, or § 25.227 may be routinely licensed for analog transmissions in the 14.0-14.5 GHz band with bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) if ~~the equivalent diameter of the transmitting antenna is 1.2 meters or greater,~~ input power spectral density into the antenna will not exceed −8 | SIA proposes to eliminate the minimum antenna diameter requirement. Deletion of 25.134 is consequential to SIA proposal |

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| | | | equivalent diameter of the transmitting antenna is 1.2 meters or greater, input power spectral density into the antenna will not exceed −8 −10log$_{10}$(N) dBW/4 kHz, and the applicant certifies conformance with relevant antenna performance standards in § 25.209(a) and (b). | ~~−10log$_{10}$(N)~~ dBW/4 kHz, and the applicant certifies conformance with relevant antenna performance standards in § 25.209(a) and (b). | |
| | 25.212(c)(2) | | (2) An earth station that is not subject to licensing under §25.134, §25.222, §25.226, or §25.227 may be routinely licensed for digital transmission, including digital video transmission, in the 14.0-14.5 GHz band if the equivalent diameter of the transmitting antenna is 1.2 meters or greater, input power spectral density into the antenna will not exceed −14 dBW/4 kHz, transmitted satellite carrier EIRP density will not exceed +10.0 dBW/4 kHz, and the application includes certification pursuant to §25.132(a)(1) of conformance with the antenna performance standards in §25.209(a) and (b). | ~~(2) An earth station that is not subject to licensing under §25.134~~, §25.222, §25.226, or §25.227 may be routinely licensed for digital transmission, including digital video transmission, in the 14.0-14.5 GHz band if the ~~equivalent diameter of the transmitting antenna is 1.2 meters or greater,~~ input power spectral density into the antenna will not exceed −14 dBW/4 kHz, transmitted satellite carrier EIRP density will not exceed +10.0 dBW/4 kHz, and the application includes certification pursuant to §25.132(a)(1) of conformance with the antenna performance standards in §25.209(a) and (b). | SIA proposes to eliminate the minimum antenna diameter requirement. Deletion of 25.134 is consequential to SIA proposal |
| | 25.212(d) | | (d) An individual earth station that is not subject to licensing under § 25.221 may be routinely licensed for digital transmission in the 5925-6425 MHz band or analog transmission in that band with carrier bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) if the equivalent diameter of the transmit antenna is 4.5 meters or greater, the applicant | (d) An individual earth station that is not subject to licensing under § 25.221 may be routinely licensed for digital transmission in the 5925-6425 MHz band or analog transmission in that band with carrier bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) if the equivalent diameter of the transmit antenna is 4.5 meters or greater, 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 ~~−10log$_{10}$(N)~~ dBW/4 kHz for analog carriers or −2.7 | |

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| | | | certifies conformance with relevant antenna performance standards in § 25.209(a) and (b), and power density into the antenna will not exceed +0.5 −10log$_{10}$(N) dBW/4 kHz for analog carriers or −2.7 −10log$_{10}$(N) dBW/4 kHz for digital carriers, where "N" is as defined in paragraph (c)(1) of this section. | ~~−10log$_{10}$(N)~~ dBW/4 kHz for digital carriers~~, where "N" is as defined in paragraph (c)(1) of this section~~. | |
| | 25.212(g) | | (g) An earth station not subject to network licensing under § 25.134 may be routinely licensed for digital transmission in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands if the equivalent diameter of the transmitting antenna is 66 centimeters or greater, 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) An earth station not subject to network licensing under § 25.134~~ may be routinely licensed for digital transmission in the 28.35-28.6 GHz and/or 29.25-30.0 GHz bands if the ~~equivalent diameter of the transmitting antenna is 66 centimeters or greater,~~ 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). | SIA proposes to eliminate the minimum antenna diameter requirement.<br><br>Deletion of 25.134 is consequential to SIA proposal |
| F.15. (89) | 25.218(a) | (a) This section applies to all applications for Fixed-Satellite Service earth stations transmitting to geostationary space stations in the C band, Ku band, or extended Ku band, except for: | (a) This section applies to applications for Fixed-Satellite Service earth stations transmitting to geostationary-orbit space stations in the conventional C-band, extended C-band, conventional Ku-band, or extended Ku band, including VSAT applications not meeting routine licensing criteria in these bands in § 25.134, with the following exceptions: | (a) This section applies to applications for Fixed-Satellite Service earth stations transmitting to geostationary-orbit space stations in the conventional C-band, extended C-band, conventional Ku-band, or extended Ku band, with the following exceptions: | SIA -proposes deletion of VSAT references/ provisions.<br>The deletion of 25.134 would make all stations eligible to use the conditions stated in 25.218 and thus make the |

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td>clarification unnecessary.</td></tr>
<tr><td>F.10.<br>(78)</td><td>25.218(a)(2)</td><td>(2) Analog video earth station applications.</td><td>(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.</td><td></td><td>SIA agrees with FCC proposal</td></tr>
<tr><td>F.19<br>(109)</td><td>25.218(b)</td><td>(b) Earth station applications subject to this section are eligible for routine processing if they meet the applicable off-axis EIRP density envelope set forth in this section below. The terms “conventional Ku band” and “extended Ku band are defined in §25.103.</td><td>(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 below and include the table required by § 25.115(h).</td><td>Note FCC proposes to remove 25.115(h) (see App. A, para. 9)</td><td>SIA notes that the FCC proposes deletion of 25.115(h). SIA agrees with FCC proposal with correct rule reference.</td></tr>
<tr><td>F.5 (62)<br>F.7 (71)</td><td>25.218(c)(1)</td><td>(c) C-band analog earth station operations. (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:
<table>
<tr><td>29.5-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>8.5</td><td>dBW/4 kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>32.5-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>−9.5</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ is the angle in degrees from the line connecting the focal point of the antenna to the target satellite, and the geostationary orbit plane is determined by the focal point of the antenna and the line tangent to the arc of the</td><td>c) <u>Analog earth station operation in the conventional or extended C-band</u>. (1) In the plane tangent to the GSO arc, as defined in § 25.103:
<table>
<tr><td>29.5-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>8.5-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>32.5-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−9.5-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ is the angle in degrees from a line from the earth station antenna to the assigned</td><td>(c) <u>Analog earth station operation in the conventional or extended C-band</u>. (1) In the local plane of the GSO arc, as defined in § 25.103:
<table>
<tr><td>29.5-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>8.5</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>32.5-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−9.5</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ is the angle in degrees from the axis of the main lobe measured in the local plane of the GSO arc. The off-axis EIRP density <u>mask</u> above , may <u>be</u> exceeded to the <u>same</u> extent allowed <u>for by the off-axis gain mask</u> in 25.209(a)(3).<br>.</td><td>SIA proposes deleting 10 log (N) rules.<br>~~SIA proposes using combination of Rec 732-1and current rules for sidelobe~~ and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td></tr>
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<td>geostationary satellite orbit at the position of the target satellite. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB.</td>
<td>location of the target satellite and “N” is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite. The EIRP density levels specified for θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F.5 (62)<br>F.7 (71)</td>
<td>25.218(c)(2)</td>
<td>(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:
<table>
<tr><td>32.5-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤θ ≤48°</td></tr>
<tr><td>−9.5</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ is the angle in degrees from the line connecting the focal point of the antenna to the target satellite, within any plane that includes that line, with the exception of the plane determined by the focal point of the antenna and the line tangent to the arc of the geostationary satellite orbit at the position of the target satellite. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe</td>
<td>(2) In the plane perpendicular to the GSO arc, as defined in § 25.103:
<table>
<tr><td>32.5-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ θ ≤ 48°</td></tr>
<tr><td>−9.5-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ 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 θ angles not included in that region, on each side of the line from the earth station to the target satellite.</td>
<td>(2) In the plane orthogonal to the local plane of the GSO arc, as defined in § 25.103:
<table>
<tr><td>32.5-25log$_{10}$φ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ φ ≤ 48°</td></tr>
<tr><td>−9.5</td><td>dBW/4 kHz</td><td>For</td><td>48° < φ ≤ 180°</td></tr>
</table>
where φ is the angle in degrees from the axis of the main lobe measured in the plane orthogonal to the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).
.</td>
<td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “plane orthogonal to local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td>
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<td></td>
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<td>and shall not exceed the envelope by more than 6 dB.</td>
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<tr>
<td>F.5 (62)<br>F.7 (71)</td>
<td>25.218(d)(1) added extended C Band, used 1 MHZ reference BW,</td>
<td>d) C-band digital earth station operations. (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:
<table>
<tr><td>26.3-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>5.3-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>29.3 - 10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>−12.7-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section, and N is defined below. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB. For digital SCPC using frequency division multiple access (FDMA) or time division multiple access (TDMA) technique, N is equal to one. For digital SCPC using code division multiple access (CDMA) technique, N is the maximum number of co-frequency</td>
<td>(d) <u>Digital earth station operation in the conventional or extended C-band</u>. (1) In the plane tangent to the GSO arc:
<table>
<tr><td>26.3-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤7°</td></tr>
<tr><td>5.3-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>29.3-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−12.7-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ is as defined in paragraph (c)(1) of this section, and N is defined below. The EIRP density levels specified for θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, “N” is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting</td>
<td>(d) <u>Digital earth station operation in the conventional or extended C-band</u>. (1) In the local plane of the GSO arc:
<table>
<tr><td>26.3-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤7°</td></tr>
<tr><td>5.3</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>29.3)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−12.7</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ is as defined in paragraph (c)(1) of this section. The off-axis EIRP density <u>mask</u> above , may <u>be</u> exceeded to the <u>same</u> extent allowed <u>for by the off-axis gain mask</u> in 25.209(a)(3).</td>
<td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1). <u>SIA supports addition of Extended C bands.</u></td>
</tr>
</table>

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<tr><td></td><td></td><td>simultaneously transmitting earth stations in the same satellite receiving beam.</td><td>simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation.</td><td></td><td></td></tr>
<tr><td>F.5 (62)<br>F.7 (71)</td><td>25.218(d)(2)</td><td>(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:<table><tr><td>29.3-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤θ ≤48°</td></tr><tr><td>−12.7-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤180°</td></tr></table>where θ is defined in paragraph (c)(2) of this section, and N is defined in paragraph (d)(1) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.</td><td>(2) In the plane perpendicular to the GSO arc:<table><tr><td>29.3-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ θ ≤ 48°</td></tr><tr><td>−12.7-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr></table>where θ is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(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 θ angles not included in that region, on each side of the line from the earth station to the target satellite.</td><td>(2) In the plane orthogonal to the local plane of the GSO arc:<table><tr><td>29.3-25log$_{10}$ φ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ φ ≤ 48°</td></tr><tr><td>−12.7</td><td>dBW/4 kHz</td><td>For</td><td>48° < φ ≤ 180°</td></tr></table>where φ is as defined in paragraph (c)(2) of this section, The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).</td><td>SIA proposes deleting 10 log (N) rules and using Rec 732-1 for sidelobe and backlobe allowances, and using “plane orthogonal to local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td></tr>
<tr><td>F.7 (71)</td><td>25.218(d)(3)<br>Add based on SIA proposal</td><td></td><td>(3) A license application for a network using variable power-density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates the following:<br>(i) Off-axis EIRP density from each station in the network will</td><td>(3) A license application for a network of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates aggregate off axis EIRP density for 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 limit specified in paragraphs (d)(1) and (d)(2) of this section.</td><td>SIA/proposes alternative approach to address all 10 log(N) and associated 1dB rules.</td></tr>
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<td>be kept at least 1 dB below the levels specified in paragraphs (d)(1) and (2) of this section, with the value of N=1.<br>(ii) Aggregate EIRP density toward any co-frequency space station other than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will not exceed the limit specified in paragraph (d)(3)(i) above.</td>
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</tr>
<tr>
<td>F.5 (62)<br>F.7 (71)</td>
<td>25.218(e)(1)</td>
<td>e) Conventional Ku-band analog earth station operations. (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:
<table>
<tr><td>21-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>0</td><td>dBW/4 kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>24-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>−18</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤85°</td></tr>
<tr><td>−8</td><td>dBW/4 kHz</td><td>For</td><td>85° <θ ≤180°</td></tr>
</table>
where θ and the plane of the geostationary satellite are defined in paragraph (c)(1) of this section. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no</td>
<td>(e) <u>Analog earth station operation in the conventional Ku-band</u>. (1) In the plane tangent to the GSO arc:
<table>
<tr><td>21-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>0-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>24-10log$_{10}$(N)-25 log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−18-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 85°</td></tr>
<tr><td>−8-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>85° < θ ≤ 180°</td></tr>
</table>
where θ is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º</td>
<td>(e) <u>Analog earth station operation in the conventional Ku-band</u>. (1) In the local plane of the GSO arc:
<table>
<tr><td>~~21-25log$_{10}$θ~~</td><td>~~dBW/4 kHz~~</td><td>~~For~~</td><td>~~1.5° ≤ θ ≤ 7°~~</td></tr>
<tr><td>~~0~~</td><td>~~dBW/4 kHz~~</td><td>~~For~~</td><td>~~7° < θ ≤ 9.2°~~</td></tr>
<tr><td>~~24-25 log$_{10}$θ~~</td><td>~~dBW/4 kHz~~</td><td>~~For~~</td><td>~~9.2° < θ ≤ 48°~~</td></tr>
<tr><td>~~−18~~</td><td>~~dBW/4 kHz~~</td><td>~~For~~</td><td>~~48° < θ ≤ 85°~~</td></tr>
<tr><td>~~−8~~</td><td>~~dBW/4 kHz~~</td><td>~~For~~</td><td>~~85° < θ ≤ 180°~~</td></tr>
</table>
<table>
<tr><td><u>21-25log$_{10}$θ</u></td><td><u>dBW/4 kHz</u></td><td><u>For</u></td><td><u>1.5° ≤ θ ≤ 7°</u></td></tr>
<tr><td><u>0</u></td><td><u>dBW/4 kHz</u></td><td><u>For</u></td><td><u>7° < θ ≤ 9.2°</u></td></tr>
<tr><td><u>24-25 log$_{10}$θ</u></td><td><u>dBW/4 kHz</u></td><td><u>For</u></td><td><u>9.2 < θ ≤ 19.1°</u></td></tr>
<tr><td><u>−8</u></td><td><u>dBW/4 kHz</u></td><td><u>For</u></td><td><u>19.1° < θ ≤ 180°</u></td></tr>
</table>
where θ is as defined in paragraph (c)(1) of this section. The off-axis EIRP density <u>mask</u> above ,</td>
<td><u>SIA proposes deleting 10</u> log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1). <u>SIA proposes to flatten the mask from 19.1 – 180°.</u></td>
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<td>individual sidelobe exceeds the envelope given above by more than 3 dB.</td>
<td></td>
<td>may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3).</td>
<td></td>
</tr>
<tr>
<td>F.5 (62)<br>F.7 (71)</td>
<td>25.218(e)(2)</td>
<td>2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:
<table>
<tr><td>24-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤θ ≤48°</td></tr>
<tr><td>−18</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤85°</td></tr>
<tr><td>−8</td><td>dBW/4 kHz</td><td>For</td><td>85° <θ ≤180°</td></tr>
</table>
where θ is defined in paragraph (c)(2) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.</td>
<td>(2) In the plane perpendicular to the GSO arc:
<table>
<tr><td>24-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ θ ≤48°</td></tr>
<tr><td>−18-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 85°</td></tr>
<tr><td>−8-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>85° < θ ≤ 180°</td></tr>
</table>
where θ 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 θ angles not included in that region, on each side of the line from the earth station to the target satellite.</td>
<td>(2) In the plane orthogonal to the local plane of the GSO arc:
<table>
<tr><td>24-25log$_{10}$ φ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ φ ≤~~48~~19.1°</td></tr>
<tr><td>~~−18~~</td><td>~~dBW/4 kHz~~</td><td>~~For~~</td><td>~~48° < φ≤ 85°~~</td></tr>
<tr><td>−8</td><td>dBW/4 kHz</td><td>For</td><td>~~85~~19.1° < φ ≤ 180°</td></tr>
</table>
where φ is the angle in degrees from the axis of the main lobe measured in the plane orthogonal to the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).</td>
<td>SIA proposes deleting 10 log (N) rules and using Rec 732-1 for sidelobe and backlobe allowances, and using “plane orthogonal to local plane of the GSO Arc” and the modified theta definition from 25.138(a)(1) for φ. SIA proposes to flatten the mask from 19.1 – 180°.</td>
</tr>
<tr>
<td>F.5 (62)<br>F.7 (71)</td>
<td>25.218(f)(1)</td>
<td>(f) Conventional Ku-band digital earth station operations. (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:
<table>
<tr><td>15-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>−6-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
</table></td>
<td>(f) Digital earth station operation in the conventional Ku-band. (1) In the plane tangent to the GSO arc:
<table>
<tr><td>15-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>−6-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
</table></td>
<td>(f) Digital earth station operation in the conventional Ku-band. (1) In the local plane of the GSO arc:
<table>
<tr><td>15-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>−6</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>18 -25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ ~~48~~19.1°</td></tr>
<tr><td>~~−24~~</td><td>~~dBW/4 kHz~~</td><td>~~For~~</td><td>~~48° < θ ≤ 85°~~</td></tr>
</table></td>
<td>SIA proposes deleting 10 log (N) rules and using combination Rec 732-1 and current values for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td>
</tr>
</table>

| | | | | | |
|---|---|---|---|---|---|
| | | <table><tr><td>18-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4kHz</td><td>For</td><td>9.2° <θ ≤48°</td></tr><tr><td>−24-10log$_{10}$(N)</td><td>dBW/4kHz</td><td>For</td><td>48° <θ ≤85°</td></tr><tr><td>−14-10log$_{10}$(N)</td><td>dBW/4kHz</td><td>For</td><td>85° <θ ≤180°</td></tr></table> where θ and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section, and N is defined below. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB. For digital SCPC using frequency division multiple access (FDMA) or time division multiple access (TDMA) technique, N is equal to one. For digital SCPC using code division multiple access (CDMA) technique, N is the maximum number of co-frequency simultaneously transmitting earth stations in the same satellite receiving beam. | <table><tr><td>18-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr><tr><td>−24-10log$_{10}$(N)</td><td>dBW/4kHz</td><td>For</td><td>48° < θ ≤ 85°</td></tr><tr><td>−14-10log$_{10}$(N)</td><td>dBW/4kHz</td><td>For</td><td>85° < θ ≤ 180°</td></tr></table> where θ 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 θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º. | <table><tr><td>-14</td><td>dBW/4kHz</td><td>For</td><td>19.1~~85~~° < θ ≤ 180°</td></tr></table> where θ is as defined in paragraph (c)(1) of this section. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3). | SIA proposes to flatten the mask from 19.1 – 180°. |
| F.5 (62)<br>F.7 (71) | 25.218(f)(2) | 2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths: <table><tr><td>18-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4kHz</td><td>For</td><td>3° ≤θ ≤48°</td></tr></table> | (2) In the plane perpendicular to the GSO arc: <table><tr><td>18-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4kHz</td><td>For</td><td>3° ≤ θ ≤ 48°</td></tr></table> | (2) In the plane orthogonal to the plane to the GSO arc: <table><tr><td>18 - 25log$_{10}$φ</td><td>dBW/4kHz</td><td>For</td><td>3° ≤ φ ≤ ~~48~~</td></tr></table> | SIA proposes deleting 10 log (N) rules and using Rec 732-1 for sidelobe and backlobe allowances, and using “plane |

| | | | | |
|---|---|---|---|---|
| | | <table><tr><td>−24-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤85°</td></tr><tr><td>−14-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>85° <θ ≤180°</td></tr></table> where θ is defined in paragraph (c)(2) of this section, and N is defined in paragraph (f)(1) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB. | <table><tr><td>−24-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 85°</td></tr><tr><td>−14-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>85° < θ ≤ 180°</td></tr></table> where θ is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(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 θ angles not included in that region, on each side of the line from the earth station to the target satellite. | <table><tr><td></td><td></td><td></td><td>19.1°</td></tr><tr><td colspan="3">~~−24~~</td><td>~~dBW/4 kHz~~ ~~For~~ ~~48° < φ ≤ 85°~~</td></tr><tr><td>−14</td><td>dBW/4 kHz</td><td>For</td><td>~~85~~ 19.1° <φ ≤ 180°</td></tr></table> where φ is as defined in paragraph (c)(2) of this section. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4). | orthogonal to the Local plane of the GSO Arc" and the modified theta definition from 25.138(a)(1) for φ. SIA proposes to flatten the mask from 19.1 – 180°. |
| F.7 (71) | 25.218(f)(3) Add based on SIA proposal | | (3) A license application for a network using variable power-density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates the following:<br>(i) Off-axis EIRP density from each station in the network will be kept at least 1 dB below the levels specified in paragraphs (f)(1) and f)(2) of this section, with the value of N=1.<br>(ii) Aggregate EIRP density toward any co-frequency space station other than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will not exceed the limit | 3) A license application for a network of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates aggregate EIRP density for 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 limit specified in paragraphs (f)(1) and f(2) of this section. | SIA /proposes deleting all 10 log(N) and associated 1dB rules. |

<table>
<tr><td></td><td></td><td></td><td>specified in paragraph (f)(3)(i) above.</td><td></td><td></td></tr>
<tr><td>F.5 (62)<br>F.7 (71)</td><td>25.218(g)(1)</td><td>(g) Extended Ku-band analog earth station operations. (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:
<table>
<tr><td>21-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>0</td><td>dBW/4 kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>24-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>−18</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB.</td><td>(g) Analog earth station operation in the extended Ku-band. (1) In the plane tangent to the GSO arc:
<table>
<tr><td>21-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>0-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>24-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−18-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ 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 θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º.</td><td>(g) Analog earth station operation in the extended Ku-band. (1) In the local plane of the GSO arc:
<table>
<tr><td>21-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>0</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>24~~)~~-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−18</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table>
where θ is as defined in paragraph (c)(1) of this section. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3).</td><td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td></tr>
<tr><td>F.5 (62)<br>F.7 (71)</td><td>25.218(g)(2)</td><td>(2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:
<table>
<tr><td>24-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤θ ≤48°</td></tr>
<tr><td>−18</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table></td><td>(2) In the plane perpendicular to the GSO arc:
<table>
<tr><td>24-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ θ ≤ 48°</td></tr>
<tr><td>−18-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 180°</td></tr>
</table></td><td>(2) In the plane orthogonal to the local plane of the GSO arc:
<table>
<tr><td>24-25log$_{10}$φ</td><td>dBW/4 kHz</td><td>For</td><td>3° ≤ φ ≤ 48°</td></tr>
<tr><td>−18</td><td>dBW/4 kHz</td><td>For</td><td>48° <φ ≤ 180°</td></tr>
</table>
where φ is as defined in paragraph (c)(2) of this section. The off-axis EIRP density mask above ,</td><td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “plane</td></tr>
</table>

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<tr>
<td></td>
<td></td>
<td>where θ is defined in paragraph (c)(2) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.</td>
<td>where θ 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 θ angles not included in that region, on each side of the line from the earth station to the target satellite.</td>
<td>may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).</td>
<td>orthogonal to the local plane of the GSO Arc” and the modified theta definition from 25.138(a)(1) for φ.</td>
</tr>
<tr>
<td>F.5 (62)<br>F.7 (71)</td>
<td>25.218(h)(1)</td>
<td>(h) Extended Ku-band digital earth station operations. (1) In the plane of the geostationary satellite orbit as it appears at the particular earth station location:
<table>
<tr><td>15-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>−6-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>18-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>−24-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤180°</td></tr>
</table>
where θ and the plane of the geostationary satellite orbit are defined in paragraph (c)(1) of this section, and N is defined below. For the purposes of this section, the peak EIRP density of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no</td>
<td>(h) Digital earth station operation in the extended Ku-band. (1) In the plane tangent to the GSO arc:
<table>
<tr><td>15-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>−6-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>18-10log$_{10}$(N)-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−24-10log$_{10}$(N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤180°</td></tr>
</table>
where θ 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 θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º.</td>
<td>(h) Digital earth station operation in the extended Ku-band. (1) In the local plane of the GSO arc:
<table>
<tr><td>15-25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>−6</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>18 -25log$_{10}$θ</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−24</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤180°</td></tr>
</table>
where θ is as defined in paragraph (c)(1) of this section. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3).</td>
<td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td>
</tr>
</table>

| | | | | | |
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| | | individual sidelobe exceeds the envelope given above by more than 3 dB. For digital SCPC using frequency division multiple access (FDMA) or time division multiple access (TDMA) technique, N is equal to one. For digital SCPC using code division multiple access (CDMA) technique, N is the maximum number of co-frequency simultaneously transmitting earth stations in the same satellite receiving beam. | | | |
| F.5 (62)<br>F.7 (71) | 25.218(h)(2) | 2) In all other directions, or in the plane of the horizon including any out-of-plane potential terrestrial interference paths:<br>$18-10\log_{10}(N)-25\log_{10}\theta$ dBW/4 kHz For $3° \leq \theta \leq 48°$<br>$-24-10\log_{10}(N)$ dBW/4 kHz For $48° < \theta \leq 85°$<br>where θ is defined in paragraph (c)(2) of this section and N is defined in paragraph (h)(1) of this section. For the purposes of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB. | (2) In the plane perpendicular to the GSO arc:<br>$18-10\log_{10}(N)-25\log_{10}\theta$ dBW/4 kHz For $3° \leq \theta \leq 48°$<br>$-24-10\log_{10}(N)$ dBW/4 kHz For $48° < \theta \leq 85°$<br>where θ is as defined in paragraph (c)(1) of this section and N is as defined in paragraph (d)(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 θ angles not included in that region, on each side of the line from the earth station to the target satellite. | (2) In the plane orthogonal to the local plane of the GSO arc:<br>$18-25\log_{10}\varphi$ dBW/4 kHz For $3° \leq \varphi \leq 48°$<br>$-24$ dBW/4 kHz For $48° < \varphi \leq 85°$<br>Where φ is as defined in paragraph (c)(2) of this section. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4). | SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using "plane orthogonal to the local plane of the GSO Arc" and the modified theta definition from 25.138(a)(1) for φ. |
| F.7 (71) | 25.218(h)(3) Add Based on SIA proposal | | (3) A license application for a network using variable power-density control of earth stations transmitting simultaneously in shared frequencies to the same | 3) A license application for a network of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates aggregate EIRP density for co frequency earth | SIA proposes deleting all 10 log(N) and associated 1dB rules and proposes |

| | | | | | |
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| | | | target satellite may be routinely processed if the applicant demonstrates the following:<br>(i) Off-axis EIRP density from each station in the network will be kept at least 1 dB below the levels specified in paragraphs (h)(1) and (2) of this section, with the value of N=1.<br>(ii) Aggregate EIRP density toward any co-frequency space station other than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will be kept at least 1 dB below the levels specified in paragraphs (h)(1) and (2) of this section, with the value of N=1. | stations in each target satellite receiving beam, not resulting from colliding data bursts transmitted pursuant to a contention protocol, will not exceed the limit specified in paragraphs (h)(1) and h(2) of this section. | alternative approach to address aggregate EIRP density. |
| F.20 (112-113) | 25.220(a)(1) & 2includes coordination from other rules for VSAT ,20/30 GHZ, ESVS, VMES, ESAAs | (a)(1) The requirements in this section apply to earth station applications of the types to which §25.218 applies but that propose operation outside of relevant off-axis EIRP density envelopes specified in §25.218. This section also applies to applications for full-transponder analog video earth stations that are ineligible for routine licensing under §25.211(d).<br>(2) The requirements for petitions to deny applications filed pursuant to this section are set forth in §25.154. | (a) The requirements in this section apply to applications for, and operation of, earth stations transmitting in the conventional or extended C-band, the conventional or extended Ku-band, or the 20/30 GHz bands that do not qualify for routine licensing under relevant criteria in § 25.134, § 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). | (a) The requirements in this section apply to applications for, and operation of, earth stations transmitting in the conventional or extended C-band, the conventional or extended Ku-band, or the conventional GSO Ka bands 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). | SIA proposes conventional GSO Ka bands for "20/30 GHz bands" and deletion of redundant rules in 25.221,25.222,25.226, 25.227 and proposes deletion of 25.134. |
| F.19 (109) | 25.220(b) | (b) If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in §25.209(a) and (b), the applicant must provide, | (b) Applications filed pursuant to this section must include the information required by § 25.115(g)(1).<br>* * * * * | | SIA agrees with FCC proposal |

<table>
<tr><td></td><td></td><td>as an exhibit to its FCC Form 312 application, the antenna gain patterns specified in §25.132(b).</td><td></td><td></td><td></td></tr>
<tr><td>F.20 (114-115)</td><td>25.220(d)(1)(i) remove</td><td>(d)(1)***<br>(i) A statement from the satellite operator acknowledging that the proposed operation of the subject non-conforming earth station with its satellite(s) has the potential to receive interference from adjacent satellite networks that may be unacceptable.</td><td>reserved</td><td></td><td>SIA agrees with FCC proposal</td></tr>
<tr><td>F.5 (62)<br>F.21 (120)</td><td>25.221(a)(1)(i)(A)</td><td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(A) The off-axis EIRP spectral-density emitted from the ESV, in the plane of the GSO as it appears at the particular earth station location, shall not exceed the following values:
<table>
<tr><td>26.3 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>5.3 –10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>7° <θ ≤9.2°</td></tr>
<tr><td>29.3 –10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>9.2° <θ ≤48°</td></tr>
<tr><td>–12.7 –10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° <θ ≤180°</td></tr>
</table>
Where theta (θ) is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, the plane of the GSO is determined by the focal point of the</td><td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(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:
<table>
<tr><td>26.3 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>5.3 –10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>29.3 –10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>–12.7 –10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° < θ ≤ 180°</td></tr>
</table>
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. For stations in networks that allow multiple</td><td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(A) Off-axis EIRP spectral density emitted in the local plane of the GSO arc, as defined in § 25.103, shall not exceed the following values:
<table>
<tr><td>26.3 – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>5.3</td><td>dBW/4 kHz</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>29.3 – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>–12.7</td><td>dBW/4 kHz</td><td>for</td><td>48° < θ ≤ 180°</td></tr>
</table>
Where theta (θ) is the angle in degrees from the axis of the main lobe measured in the local plane of the GSO arc The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3).</td><td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td></tr>
</table>

| | | | | | |
|---|---|---|---|---|---|
| | | antenna and the line tangent to the arc of the GSO at the orbital location of the target satellite. For an ESV network using frequency division multiple access (FDMA) or time division multiple access (TDMA) techniques, N is equal to one. For ESV networks using multiple co-frequency transmitters that have the same EIRP, N is the maximum expected number of co-frequency simultaneously transmitting ESV earth stations in the same satellite receiving beam. For the purpose of this section, the peak EIRP of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB. | terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. The EIRP density levels specified for θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º. | | |

<table>
<tr>
<td>F.4 (61)</td>
<td>25.221(a)(1)(i)(B)</td>
<td>(B) In all directions other than along the GSO, the off-axis EIRP spectral-density for co-polarized signals emitted from the ESV shall not exceed the following values:
<table>
<tr><td>29.3 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤θ ≤48°</td></tr>
<tr><td>−12.7 – 10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° <θ ≤180°</td></tr>
</table>
Where θ and N are defined in paragraph (a)(1)(i)(A) of this section. This off-axis EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the orbital location of the target satellite with the exception of the plane of the GSO as defined in paragraph (a)(1)(i)(A) of this section. For the purpose of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the gain envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.</td>
<td>(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:
<table>
<tr><td>29.3 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤ θ ≤ 48°</td></tr>
<tr><td>−12.7 – 10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° < θ ≤ 180°</td></tr>
</table>
Where θ and N are 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 θ angles not included in that region, on each side of the line from the earth station to the target satellite</td>
<td>(B) In the plane orthogonal to the local plane of the GSO arc, as defined in § 25.103, EIRP spectral density of co-polarized signals shall not exceed the following values:
<table>
<tr><td>29.3 – 25logφ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤ φ ≤ 48°</td></tr>
<tr><td>−12.7</td><td>dBW/4 kHz</td><td>for</td><td>48° < φ ≤ 180°</td></tr>
</table>
Where φ is the angle in degrees from the axis of the main lobe measured in the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).</td>
<td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “plane orthogonal to the local plane of the GSO Arc” and the modified theta definition from 25.138(a)(1) for φ.</td>
</tr>
<tr>
<td>F.4 (61)<br>F.5 (62)</td>
<td>25.221(a)(1)(i)(C)</td>
<td>C) In all directions, the off-axis EIRP spectral-density for cross-polarized signals emitted from the ESV shall not exceed the following values:
<table>
<tr><td>16.3 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤θ ≤7.0°</td></tr>
<tr><td>−4.7 – 10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>7.0° <θ ≤9.2°</td></tr>
</table></td>
<td>(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:
<table>
<tr><td>16.3 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤ θ ≤ 7.0°</td></tr>
</table></td>
<td>(C) The off-axis EIRP spectral-density of cross-polarized signals shall not exceed the following values:<br>(i) In the local plane of the GSO arc~~ or in the plane orthogonal to the local plane of the GSO arc~~:
<table>
<tr><td>16.3 – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤ θ ≤ 7.0°</td></tr>
</table></td>
<td>SIA proposes deleting all 10 log(N) and associated 1dB rules. and limiting cross pol to no greater than 7° and using “local plane of the GSO arc” and plane orthogonal</td>
</tr>
</table>

| | | | | | |
|---|---|---|---|---|---|
| | | Where θ and N are defined as set forth in paragraph (a)(1)(i)(A) of this section. This EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the orbital location of the target satellite. | −4.7 − 10log(N) dBW/4 kHz for 7.0° < θ ≤ 9.2°<br>Where θ and N are as defined in paragraph (a)(1)(i)(A) of this section. | Where θ is defined in paragraph (a)(1)(i)(A) of this section.<br>(ii) In the plane orthogonal to the local plane of the GSO arc<br>16.3 − 25logφ dBW/4 kHz for 1.8° ≤ φ ≤ 7.0°<br>where φ is defined in(a)(1)(i)(B) of this section. | to the local plane and theta and phi definitions from modified 25.138(a)(1). |
| F.5 (62) | 25.221(a)(1)(i)(D) | (D) 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.<br>***** | (D) For non-circular ESV antennas, the major axis of the antenna must be aligned with the plane tangent to the GSO arc to the extent required to meet the specified off-axis EIRP spectral-density criteria.<br>***** | deletion | SIA proposes deletion. See main section of comments for discussion. |
| F.7 (72) | 25.221(a)(2) | (2) The following requirements shall apply to an ESV that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section. An ESV or ESV system operating under this paragraph (a)(2) shall file certifications and provide a detailed demonstration(s) as described in paragraph (b)(2) of this section.<br>(i) The ESV shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(2) of this section.<br>(ii) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located | (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.<br>(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. | | SIA agrees with FCC proposal |

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| | | within 6 degrees longitude of the target satellite, the ESV operator shall accept the power-density levels that would accommodate that adjacent satellite.<br>(iii) The ESV shall operate in accordance with the off-axis EIRP spectral-densities that the ESV supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(2) of this section. Except for ESVs with variable power systems, the ESV shall automatically cease emissions within 100 milliseconds if the ESV transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator. For ESVs using variable power systems, the individual ESV transmitter shall automatically cease or reduce emissions within 100 milliseconds if the ESV transmitter exceeds the off-axis EIRP-density limits supplied to the target satellite operator; the individual transmitter must be self-monitoring and capable of shutting itself off; and if one or more ESV transmitters causes the aggregate off-axis EIRP-densities to exceed the off-axis EIRP-density limits supplied to the target satellite operator, then the transmitter or transmitters shall cease or reduce emissions within 100 milliseconds of receiving a command from the system's central control and monitoring station. | (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.<br>(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. | | |
| F.21 (119) | 25.221(a)(3) Deletes redundant last | (3) The following requirements shall apply to an ESV system that uses variable power-density control of | (3) The following requirements apply to an ESV system that uses variable power control of | (3) The following requirements apply to an ESV system that uses variable power control of individual earth stations transmitting | SIA proposes deleting all 10 log(N) and |

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| | sentence of 25.221(a)(3)(i) | individual simultaneously transmitting co-frequency ESV earth stations in the same satellite receiving beam unless that ESV system operates pursuant to paragraph (a)(2) of this section. An ESV system operating under this paragraph (a)(3) shall provide a detailed demonstration as described in paragraph (b)(3) of this section.<br>(i) The effective aggregate EIRP-density from all terminals shall be at least 1 dB below the off-axis EIRP-density limits defined in paragraph (a)(1)(i) of this section, with the value of N = 1. In this context the term "effective" means that the resultant co-polarized and cross-polarized EIRP-density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single transmitter operating 1 dB below the off-axis EIRP-density limits defined in paragraph (a)(1)(i) of this section. An ESV system operating under this paragraph (a)(3) shall provide a detailed demonstration as described in paragraph (b)(3)(i) of this section.<br>(ii) The individual ESV transmitter shall automatically cease or reduce emissions within 100 milliseconds if the ESV transmitter exceeds the off-axis EIRP-density limits specified in paragraph (a)(3)(i) of this section. The individual transmitter must be self-monitoring and capable of shutting itself off. If one or more ESV transmitters causes the aggregate off-axis EIRP-densities to exceed the off-axis EIRP-density | 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.<br>(i) Aggregate EIRP density from terminals in the network toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits defined in paragraph (a)(1)(i) of this section, with the value of N = 1.<br>(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.<br>(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 | simultaneously in the same frequencies to the same target satellite, unless the ESV system operates pursuant to paragraph (a)(2) of this section.<br><br>(i) aggregate EIRP density for 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 limit specified in paragraphs (a)(1)(i) of this section.<br><br>(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.<br>(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.<br>* * * * * | associated 1dB rules.<br><br>SIA proposes alternative approach for aggregate EIRP density in 25.221(a)(3)(i). |

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| | | limits specified in paragraph (a)(3)(i) of this section, then the transmitter or transmitters shall cease or reduce emissions within 100 milliseconds of receiving a command from the system's central control and monitoring station. | milliseconds of receiving the command.<br>* * * * * | | |
| F.7 (72) | 25.221(b) | | (b) Applications for ESV operation in the 5925-6425 MHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on 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.<br>(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). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section 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 | (b) Applications for ESV operation in the 5925-6425 MHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on 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.<br>(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. | SIA agrees with FCC proposal with a consequential modification regarding the deletion of sentence regarding N. |

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| | | | also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.<br>* * * * * | | |
| F.19 (109) | 25.221(b)(1)(i) remove and reserve | (i) Any ESV applicant filing an application pursuant to paragraph (a)(1) of this section must file three tables showing the off-axis EIRP density level of the proposed earth station antenna in the direction of the plane of the GSO; the co-polarized EIRP density in the elevation plane, that is, the plane perpendicular to the plane of the GSO; and cross polarized EIRP density. In each table, the EIRP density level must be provided at increments of 0.1° for angles between 0° and 10° off-axis, and at increments of 5° for angles between 10° and 180° off-axis.<br>(A) For purposes of the off-axis EIRP density table in the plane of the GSO, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital position of the target satellite, and the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital position of the target satellite.<br>(B) For purposes of the off-axis co-polarized EIRP density table in the elevation plane, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital position of the target satellite, and the elevation plane is defined as the | reserve | | SIA agrees with FCC proposal |

| | | | | | |
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| | | plane perpendicular to the plane of the GSO defined in paragraph (b)(1)(i)(A) of this section.<br>(C) For purposes of the cross-polarized EIRP density table, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital position of the target satellite and the plane of the GSO as defined in paragraph (b)(1)(i)(A) of this section will be used. | | | |
| F.19<br>(109) | 25.221(b)(1)(ii) remove and reserve | (ii) A certification, in Schedule B, that the ESV antenna conforms to the gain pattern criteria of §25.209(a) and (b), that, combined with the maximum input power density calculated from the EIRP density less the antenna gain, which is entered in Schedule B, demonstrates that the off-axis EIRP spectral density envelope set forth in paragraphs (a)(1)(i)(A) through (C) of this section will be met under the assumption that the antenna is pointed at the target satellite. If an antenna proposed for use by the applicant does not comply with the antenna performance standards in §25.209(a) and (b), the applicant must provide, as an exhibit to its application, antenna gain test plots pursuant to §25.132(b)(3). | reserve | | SIA agrees with FCC proposal |
| F.5<br>(62)<br>F.21<br>(120) | 25.222(a)(1)(i)(A) | (a) * * *<br>(1) * * *<br>(i) * * *<br>(A) The off-axis EIRP spectral-density emitted from the ESV, in the plane of the GSO as it appears at the particular | (a) * * *<br>(1) * * *<br>(i) * * *<br>(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: | (a) * * *<br>(1) * * *<br>(i) * * *<br>(A) Off-axis EIRP spectral density emitted in the local plane of the GSO arc, as | SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe |

earth station location, shall not exceed the following values:

| | | | |
|---|---|---|---|
| 15−10log(N)−25logθ | dBW/4 kHz | for | 1.5° ≤θ ≤7° |
| −6 −10log(N) | dBW/4 kHz | for | 7° <θ ≤9.2° |
| 18 −10log(N)−25logθ | dBW/4 kHz | for | 9.2° <θ ≤48° |
| −24 −10log(N) | dBW/4 kHz | for | 48° <θ ≤85° |
| −14 −10log(N) | dBW/4 kHz | for | 85° <θ ≤180° |

Where theta (θ) is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital location of the target satellite. For ESV networks using frequency division multiple access (FDMA) or time division multiple access (TDMA) techniques, N is equal to one. For ESV networks using multiple co-frequency transmitters that have the same EIRP, N is the maximum expected number of co-frequency simultaneously transmitting ESV earth stations in the same satellite receiving beam. For the purpose of this section, the peak EIRP of an individual sidelobe may not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope may be exceeded by no more than 10% of the sidelobes, provided no individual

| | | | |
|---|---|---|---|
| 15 − 10log(N) − 25logθ | dBW/4 kHz | for | 1.5° ≤ θ ≤ 7° |
| − 6 −10log(N) | dBW/4 kHz | for | 7° < θ ≤ 9.2° |
| 18 −10log(N) − 25logθ | dBW/4 kHz | for | 9.2° < θ ≤ 48° |
| −24 −10log(N) | dBW/4 kHz | for | 48° < θ ≤ 85° |
| −14 −10log(N) | dBW/4kHz | for | 85° < 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. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. The EIRP density levels specified for θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º.

defined in § 25.103, shall not exceed the following values:

| | | | |
|---|---|---|---|
| 15 − 25logθ | dBW/4 kHz | for | 1.5° ≤ θ ≤ 7° |
| − 6 | dBW/4 kHz | for | 7° < θ ≤ 9.2° |
| 18 − 25logθ | dBW/4 kHz | for | 9.2° < θ ≤ ~~48~~19.1° |
| ~~−24~~ | ~~dBW/4 kHz~~ | ~~for~~ | ~~48° < θ ≤ 85°~~ |
| −14 | dBW/4kHz | for | ~~85~~19.1° < θ ≤180° |

Where theta (θ) is the angle in degrees from the axis of the main lobe measure in the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3).

and backlobe allowances, and using "Local plane of the GSO Arc" and the theta definition from 25.138(a)(1). SIA proposes to flatten the mask from 19.1 – 180°.

<table>
<tr><td></td><td></td><td>sidelobe exceeds the envelope given above by more than 3 dB.</td><td></td><td></td><td></td></tr>
<tr><td>F.4<br>(61)</td><td>25.222(a)(1)(i)(B)</td><td>(B) In all directions other than along the GSO, the off-axis EIRP spectral-density for co-polarized signals emitted from the ESV shall not exceed the following values:
<table>
<tr><td>18−10log(N)−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤θ ≤48°</td></tr>
<tr><td>−24−10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° <θ ≤85°</td></tr>
<tr><td>−14−10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>85° <θ ≤180°</td></tr>
</table>
Where θ and N are defined in paragraph (a)(1)(i)(A) of this section. This off-axis EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the orbital location of the target satellite with the exception of the plane of the GSO as defined in paragraph (a)(1)(i)(A) of this section. For the purpose of this section, the envelope may be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the gain envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.</td><td>(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:
<table>
<tr><td>18 − 10log(N) − 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤ θ ≤ 48°</td></tr>
<tr><td>−24 − 10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° < θ ≤ 85°</td></tr>
<tr><td>−14 − 10log(N)</td><td>dBW/4kHz</td><td>for</td><td>85° < θ ≤ 180°</td></tr>
</table>
Where θ and N are 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 θ angles not included in that region, on each side of the line from the earth station to the target satellite.</td><td>(B) The off-axis EIRP density of co-polarized signals shall not exceed the following values in the plane orthogonal to the local plane of the GSO arc, as defined in § 25.103:
<table>
<tr><td>18 − 25logφ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤ φ ≤ ~~48~~19.1°</td></tr>
<tr><td>~~−24~~</td><td>~~dBW/4 kHz~~</td><td>~~for~~</td><td>~~48° <φ ≤ 85°~~</td></tr>
<tr><td>−14</td><td>dBW/4kHz</td><td>for</td><td>~~85~~19.1° < φ ≤ 180°</td></tr>
</table>
Where φ is the angle in degrees from the axis of the main lobe measured in the plane orthogonal to the local plane of the GSO arc . The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).</td><td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “plane orthogonal to the local plane of the GSO Arc” and the modified theta definition from 25.138(a)(1) for φ. SIA proposes to flatten the mask from 19.1 – 180°.</td></tr>
</table>

<table>
<tr>
<td>F.4<br>(61)<br>F.5<br>(62)</td>
<td>25.222(a)(1)(i)(C)</td>
<td>(C) In all directions, the off-axis EIRP spectral-density for cross-polarized signals emitted from the ESV shall not exceed the following values:
<table>
<tr><td>5−10log(N)−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤θ ≤7.0°</td></tr>
<tr><td>−16−10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>7.0° <θ ≤9.2°</td></tr>
</table>
Where θ and N are defined as set forth in paragraph (a)(1)(i)(A) of this section. This EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the target satellite.</td>
<td>(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:
<table>
<tr><td>5−10log(N)−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤ θ ≤ 7.0°</td></tr>
<tr><td>−16−10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>7.0° < θ ≤ 9.2°</td></tr>
</table>
Where θ and N are as defined in paragraph (a)(1)(i)(A) of this section.</td>
<td>(C) The off-axis EIRP density of cross-polarized signals shall not exceed the following values:<br>(i) In the local plane of the GSO arc:
<table>
<tr><td>5−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤ θ ≤ 7.0°</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
Where θ is as defined in paragraph (a)(1)(i)(A) of this section.<br>(ii) in the plane orthogonal to the local plane of the GSO arc,
<table>
<tr><td>5−25logφ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤ φ ≤ 7.0°</td></tr>
</table>
Where φ is defined in (a)(1)(i)(B) of this section.</td>
<td>SIA proposes deleting all 10 log(N) and associated 1dB rules. and limiting cross pol to no greater than 7° and using “local plane of the GSO arc” and plane orthogonal to the local plane and theta and phi definitions from modified 25.138(a)(1).</td>
</tr>
<tr>
<td>F.5<br>(62)</td>
<td>25.222(a)(1)(i)(D)</td>
<td>(D) 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.<br>*****</td>
<td>(D) For non-circular ESV antennas, the major axis of the antenna must be aligned with the plane tangent to the GSO arc to the extent required to meet the specified off-axis EIRP density criteria.<br>* * * * *</td>
<td>Deletion.</td>
<td>SIA proposes deletion. See main section of comments for discussion.</td>
</tr>
<tr>
<td>F.7<br>(72)<br>F.20<br>(118)</td>
<td>25.222(a)(2)</td>
<td>(2) The following requirements shall apply to an ESV that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section. An ESV or ESV system operating under this paragraph (a)(2) shall file certifications and provide a detailed</td>
<td>(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.</td>
<td></td>
<td>SIA agrees with FCC proposal</td>
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</table>

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| | | demonstration(s) as described in paragraph (b)(2) of this section.<br>(i) The ESV shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(2) of this section.<br>(ii) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the ESV operator shall accept the power-density levels that would accommodate that adjacent satellite.<br>(iii) The ESV shall operate in accordance with the off-axis EIRP spectral-densities that the ESV supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(2) of this section. Except for ESVs with variable power systems, the ESV shall automatically cease emissions within 100 milliseconds if the ESV transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator. For ESVs using variable power systems, the individual ESV transmitter shall automatically cease or reduce emissions within 100 milliseconds if the ESV transmitter exceeds the off-axis EIRP-density limits supplied to the target satellite operator; the individual transmitter must be self-monitoring and capable of shutting itself off; and if one or more ESV transmitters causes the aggregate off-axis EIRP-densities to exceed the off-axis EIRP-density limits supplied to the target satellite operator, then the transmitter or transmitters shall cease or reduce emissions within 100 milliseconds of receiving a | (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.<br>(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.<br>(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. | | |

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| | | command from the system's central control and monitoring station. | | | |
| F.21 (119) | 25.222(a)(3) Deletes redundant last sentence of 25.222(a)(3)(i) | (3) The following requirements shall apply to an ESV system that uses variable power-density control of individual simultaneously transmitting co-frequency ESV earth stations in the same satellite receiving beam unless that ESV system operates pursuant to paragraph (a)(2) of this section. An ESV system operating under this paragraph (a)(3) shall provide a detailed demonstration as described in paragraph (b)(3) of this section.<br>(i) The effective aggregate EIRP-density from all terminals shall be at least 1 dB below the off-axis EIRP-density limits defined in paragraph (a)(1)(i) of this section, with the value of N=1. In this context the term “effective” means that the resultant co-polarized and cross-polarized EIRP-density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single transmitter operating 1 dB below the limits defined in paragraph (a)(1)(i) of this section. An ESV system operating under this paragraph (a)(3) shall provide a detailed demonstration as described in paragraph (b)(3)(i) of this section.<br>(ii) The individual ESV transmitter shall automatically cease or reduce emissions within 100 milliseconds if the ESV transmitter exceeds the off-axis EIRP-density limits specified in paragraph (a)(3)(i) of this section. The individual transmitter must be self-monitoring and capable of shutting itself off. If one or more ESV transmitters causes the aggregate off-axis EIRP-densities to | (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.<br>(i) Aggregate EIRP density from terminals in the network toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits defined in paragraph (a)(1)(i) of this section, with the value of N = 1.<br>(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.<br>(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.<br>* * * * * | (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.<br>(i) aggregate EIRP density for 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 limit specified in paragraphs (a)(1)(i) of this section.<br><br>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.<br>(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 | SIA supports deletion of last sentence in (a)(3)(i) as redundant with (a)(3).<br>SIA proposes alternative text for 25.222(a)(3)(i) |

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| | | exceed the off-axis EIRP-density limits specified in paragraph (a)(3)(i) of this section, then the transmitter or transmitters shall cease or reduce emissions within 100 milliseconds of receiving a command from the system's central control and monitoring station.<br>*****<br>(b) Applications for ESV operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on Form 312, and associated Schedule B, the applicable technical demonstrations in paragraphs (b)(1) or (2) of this section and the documentation identified in paragraphs (b)(3) through (5) of this section.<br>(1) An ESV applicant proposing to implement a transmitter under paragraph (a)(1) of this section must demonstrate that the transmitter meets the off-axis EIRP spectral-density limits contained in paragraph (a)(1)(i) of this section. To provide this demonstration, the application shall include the tables described in paragraph (b)(1)(i) of this section or the certification described in paragraph (b)(1)(ii) of this section. The ESV applicant also must provide the value N described in paragraph | | 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.<br>* * * * *<br>(b) Applications for ESV operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on 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.<br>(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). | |
| F.7 (72) | 25.222(b) and (b)(1) | | (b) Applications for ESV operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on 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.<br>(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). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section. 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.<br>* * * * * | (b) Applications for ESV operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on 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.<br>(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 | SIA agrees with FCC proposal with modification to delete sentence referring to N |

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| | | (a)(1)(i)(A) of this section. An ESV applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must 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 provide the demonstrations identified in paragraph (b)(1)(iv) of this section. | | (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. | |
| F.19 (109) | 25.222(b)(1)(i) remove and reserve | (i) Any ESV applicant filing an application pursuant to paragraph (a)(1) of this section must file three tables showing the off-axis EIRP density level of the proposed earth station antenna in the direction of the plane of the GSO; the co-polarized EIRP density in the elevation plane, that is, the plane perpendicular to the plane of the GSO; and cross polarized EIRP density. In each table, the EIRP density level must be provided at increments of 0.1° for angles between 0° and 10° off-axis, and at increments of 5° for angles between 10° and 180° off-axis.<br>(A) For purposes of the off-axis EIRP density table in the plane of the GSO, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital position of the target satellite.<br>(B) For purposes of the off-axis co-polarized EIRP density table in the elevation plane, the off-axis angle is the | reserved | | SIA agrees with FCC proposal |

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| | | angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the elevation plane is defined as the plane perpendicular to the plane of the GSO defined in paragraph (b)(1)(i)(A) of this section. (C) For purposes of the cross-polarized EIRP density table, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite and the plane of the GSO as defined in paragraph (b)(1)(i)(A) of this section will be used. | | | |
| F.19 (109) | 25.222(b)(1)(ii) remove and reserve | (ii) A certification, in Schedule B, that the ESV antenna conforms to the gain pattern criteria of §25.209(a) and (b), that, combined with the maximum input power density calculated from the EIRP density less the antenna gain, which is entered in Schedule B, demonstrates that the off-axis EIRP spectral density envelope set forth in paragraphs (a)(1)(i)(A) through (C) of this section will be met under the assumption that the antenna is pointed at the target satellite. If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in §25.209(a) and (b), the applicant must provide, as an exhibit to its application, antenna gain test plots pursuant to §25.132(b)(3). | reserved | | SIA agrees with FCC proposal. |
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| | 25.222(b)(3) | (3) An ESV applicant proposing to implement an ESV system under paragraph (a)(3) of this section and | (3) An applicant proposing to implement an ESV system subject to paragraph (a)(3) of this section must | | SIA agrees with FCC proposal |

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| | | using variable power-density control of individual simultaneously transmitting co-frequency ESV earth stations in the same satellite receiving beam shall provide the information in paragraphs (b)(3)(i) and (b)(3)(ii) of this section as exhibits to its ESV application. The International Bureau will place these showings on Public Notice along with the application.<br>(i) The ESV applicant shall provide a detailed showing of the measures it intends to employ to maintain the effective aggregate EIRP-density from all simultaneously transmitting co-frequency terminals operating with the same satellite transponder at least 1 dB below the EIRP-density limits defined in paragraph (a)(1)(i) of this section. In this context the term "effective" means that the resultant co-polarized and cross-polarized EIRP-density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single ESV transmitter operating at 1 dB below the limits defined in paragraph (a)(1)(i) of this section.<br>(ii) The ESV applicant shall provide a detailed showing that an individual ESV terminal is capable of automatically ceasing emissions within 100 milliseconds if the ESV transmitter exceeds the off-axis EIRP-density limit specified in paragraph (a)(3)(i) of this section and that the individual transmitter is self-monitoring and capable of shutting itself off. The ESV applicant shall also provide a detailed showing that one or more transmitters are capable of automatically ceasing or reducing emissions within 100 | provide the following information in exhibits to its earth station application:<br>(i) off-axis EIRP density data pursuant to § 25.115(g)(1);<br>(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;<br>(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<br>(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.<br>* * * * * | | |

<table>
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<td>milliseconds of receiving the appropriate command from the system's central control and monitoring station if the aggregate off-axis EIRP spectral-densities of the transmitter or transmitters exceed the off-axis EIRP-density limits specified in paragraph (a)(3)(i) of this section.<br>*****</td>
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<td></td>
<td></td>
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<tr>
<td>F.5<br>(62)</td>
<td>25.223(b) & (b)(1)</td>
<td>*****<br>b) All applications for earth station licenses in the 24.75-25.25 GHz portion of 17/24 GHz BSS shall be routinely processed if they meet the following requirements:<br>(1) 17/24 GHz BSS earth station antenna off-axis EIRP spectral density for co-polarized signals shall not exceed the following values, within ±3° of the GSO arc, under clear sky conditions:
<table>
<tr><td>32.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤θ ≤7°</td></tr>
<tr><td>11.4</td><td>dBW/MHz</td><td>for 7° ≤θ ≤9.2°</td></tr>
<tr><td>35.5-25log(θ)</td><td>dBW/MHz</td><td>for 9.2° ≤θ ≤48°</td></tr>
<tr><td>3.5</td><td>dBW/MHz</td><td>for 48° ≤θ ≤180°</td></tr>
</table>
Where θ is the angle in degrees from the axis of the main lobe.</td>
<td>* * * * *<br>(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:<br>(1) The EIRP density of co-polarized signals shall not exceed the following values in the plane tangent to the GSO arc, as defined in § 25.103, under clear sky conditions:
<table>
<tr><td>32.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤ θ ≤ 7°</td></tr>
<tr><td>11.4</td><td>dBW/MHz</td><td>for 7° ≤ θ ≤ 9.2°</td></tr>
<tr><td>35.5-25log(θ)</td><td>dBW/MHz</td><td>for 9.2° ≤ θ ≤ 48°</td></tr>
<tr><td>3.5</td><td>dBW/MHz</td><td>for 48° ≤ θ ≤ 180°</td></tr>
</table>
Where θ is the off axis angle in degrees from a line from the earth station antenna main beam direction to the assigned orbital location of the target satellite.</td>
<td>* * * * *<br>(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:<br>(1) The EIRP density of co-polarized signals shall not exceed the following values in the local plane of the GSO arc, as defined in § 25.103, under clear sky conditions:
<table>
<tr><td>32.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤ θ ≤ 7°</td></tr>
<tr><td>11.4</td><td>dBW/MHz</td><td>for 7° ≤ θ ≤ 9.2°</td></tr>
<tr><td>35.5-25log(θ)</td><td>dBW/MHz</td><td>for 9.2° ≤ θ ≤ 48°</td></tr>
<tr><td>3.5</td><td>dBW/MHz</td><td>for 48° ≤ θ ≤ 180°</td></tr>
</table>
Where θ is the off axis angle in degrees from the axis of the main lobe measured in the local plane of the GSO arc.</td>
<td>SIA proposes “local plane of the GSO arc” and the theta definition from 25.138(a)(1).</td>
</tr>
<tr>
<td>F.4<br>(61)</td>
<td>25.223(b)(2)</td>
<td>2) 17/24 GHz BSS earth station antenna off-axis EIRP spectral density for co-polarized signals shall not exceed the following values, for all directions other</td>
<td>(2) The EIRP density of co-polarized signals shall not exceed the following values under clear sky conditions in the plane perpendicular to the GSO arc, as defined in § 25.103:</td>
<td>(2) The EIRP density of co-polarized signals shall not exceed the following values under clear sky conditions in</td>
<td>SIA proposes “plane orthogonal to the local plane of the GSO arc” and theta</td>
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<td>than within ±3° of the GSO arc, under clear sky conditions:
<table>
<tr><td>35.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤θ ≤7°</td></tr>
<tr><td>14.4</td><td>dBW/MHz</td><td>for 7° ≤θ ≤9.2°</td></tr>
<tr><td>38.5-25log(θ)</td><td>dBW/MHz</td><td>for 9.2° ≤θ ≤48°</td></tr>
<tr><td>6.5</td><td>dBW/MHz</td><td>for 48° ≤θ ≤180°</td></tr>
</table>
Where θ is the angle in degrees from the axis of the main lobe.</td>
<td>
<table>
<tr><td>35.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤ θ ≤ 7°</td></tr>
<tr><td>14.4</td><td>dBW/MHz</td><td>for 7° ≤ θ ≤ 9.2°</td></tr>
<tr><td>38.5-25log(θ)</td><td>dBW/MHz</td><td>for 9.2° ≤ θ ≤ 48°</td></tr>
<tr><td>6.5</td><td>dBW/MHz</td><td>for 48° ≤ θ ≤ 180°</td></tr>
</table>
Where θ is as defined in paragraph (b)(1) of this section.</td>
<td>the plane orthogonal to the local plane of the GSO arc, as defined in § 25.103:
<table>
<tr><td>35.5-25log(φ)</td><td>dBW/MHz</td><td>for 2° ≤φ ≤ 7°</td></tr>
<tr><td>14.4</td><td>dBW/MHz</td><td>for 7° ≤φ ≤ 9.2°</td></tr>
<tr><td>38.5-25log(φ)</td><td>dBW/MHz</td><td>for 9.2° ≤φ ≤ 48°</td></tr>
<tr><td>6.5</td><td>dBW/MHz</td><td>for 48° ≤φ ≤ 180°</td></tr>
</table>
Where φ is the angle in degrees from the axis of the main lobe measured in the plane orthogonal to the local plane of the GSO arc.</td>
<td>definition from modified 25.138(a)(1) and replacing θ with φ</td>
</tr>
<tr>
<td>F.5 (64)</td>
<td>25.223(b)(3)</td>
<td>3) The values given in paragraphs (b) (1) and (2) of this section may be exceeded by 3 dB, for values of θ >10°, provided that the total angular range over which this occurs does not exceed 20° when measured along both sides of the GSO arc.</td>
<td>(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 θ >10°, in 10% of the range of theta (θ) angles from 10º-180º on each side of the line from the earth station to the target satellite.</td>
<td>(3) The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3).</td>
<td>SIA proposes combination of Rec 732-1 and current values for sidelobe and backlobe exceedances</td>
</tr>
<tr>
<td>F.5 (62)</td>
<td>25.223(b)(4)</td>
<td>(4) 17/24 GHz BSS earth station antenna off-axis EIRP spectral density for cross-polarized signals shall not exceed the following values, in all directions greater than +3 relative to the GSO arc, under clear sky conditions:
<table>
<tr><td>22.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤θ ≤7°</td></tr>
<tr><td>1.4</td><td>dBW/MHz</td><td>for 7° ≤θ ≤9.2°</td></tr>
</table></td>
<td>(4) 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, under clear sky conditions:
<table>
<tr><td>22.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤ θ ≤ 7°</td></tr>
<tr><td>1.4</td><td>dBW/MHz</td><td>for 7° ≤ θ ≤ 9.2°</td></tr>
</table>
Where θ is as defined in paragraph (b)(1) of this section.</td>
<td>(4) The EIRP density of cross-polarized signals shall not exceed the following values:<br>(i) In the local plane of the GSO arc under clear sky conditions:
<table>
<tr><td>22.5-25log(θ)</td><td>dBW/MHz</td><td>for 2° ≤ θ ≤ 7°</td></tr>
</table></td>
<td>SIA proposes restricting cross pol to no greater than 7° and using “local plane of the GSO arc” and “plane orthogonal to the local plane of the GSO arc” and Theta and phi</td>
</tr>
</table>

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| | | Where is the angle in degrees from the axis of the main lobe. | | Where θ is as defined in paragraph (b)(1) of this section.<br>(ii) In the plane orthogonal to the local plane of the GSO arc under clear sky conditions,<br>22.5-25log(φ) dBW/MHz for 2° ≤ φ ≤ 7°<br>where φ is defined in (b)(2) of this section. | based on 25.138(a)(1) |
| | 25.223(c) Based on SIA proposal | (c) Each earth station license applicant that proposes levels in excess of those defined in paragraph (b) of this section must certify that all potentially affected parties acknowledge and do not object to the use of the applicant's higher power densities. For proposed power density levels less than or equal to 3 dB in excess of the limits defined in paragraph (b) of this section, the potentially affected parties are operators of co-frequency U.S.-authorized 17/24 GHz BSS satellites at angular separations of up to ±6° from the proposed satellite points of communication; for power density levels greater than 3 dB and less than or equal to 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 satellites up to ±10° from the proposed satellite points of communication. Power density levels greater than 6 dB in excess of the limits defined in paragraph (b) of this section will not be permitted. | (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.<br>(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 ±6° 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 GSO space stations up to ±10° from the proposed satellite points of communication.<br>(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 1 degree of the assigned orbital location of the co-frequency space station.<br>(3) Power density levels more than 6 dB in excess of the limits defined in paragraph (b) of this section will not be permitted. | | SIA agrees with FCC proposal. |

<table>
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<td>F.5<br>(62)</td>
<td>25.226(a)(1)(i)(A)</td>
<td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(A) The off-axis EIRP spectral-density emitted from the VMES, in the plane of the geostationary satellite orbit (GSO) as it appears at the particular earth station location, shall not exceed the following values:<br>15-10log(N)-25logθ dBW/4kHz for 1.5° ≤θ ≤7°<br>−6 −10log(N) dBW/4kHz for 7° <θ ≤9.2°<br>18 −10log(N)-25logθ dBW/4kHz for 9.2° <θ ≤48°<br>−24 −10log(N) dBW/4kHz for 48° <θ ≤85°<br>−14 −10log(N) dBW/4kHz for 85° <θ ≤180°<br>where theta (θ) is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital location of the target satellite. For VMES networks using frequency division multiple access (FDMA) or time division multiple access (TDMA) techniques, N is equal to one. For VMES networks using multiple co-frequency transmitters that have the same EIRP, N is the maximum expected number of co-frequency simultaneously transmitting VMES earth stations in the same satellite receiving beam. For the purpose of this section, the peak EIRP of an individual sidelobe shall not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope shall be exceeded by no more than 10% of the</td>
<td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(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:
<table>
<tr><td>15−10log(N)−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>−6 −10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>18 −10log(N)−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>−24 −10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° < θ ≤ 85°</td></tr>
<tr><td>−14 −10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>85° < θ ≤ 180°</td></tr>
</table>
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. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, “N” is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. The EIRP density levels specified for θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º.</td>
<td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(A) Off-axis EIRP spectral density emitted in the local plane of the GSO arc, as defined in § 25.103, shall not exceed the following values:
<table>
<tr><td>15−25log θ</td><td>dBW/4 kHz</td><td>for</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>−6</td><td>dBW/4 kHz</td><td>for</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>18 −25log θ</td><td>dBW/4 kHz</td><td>for</td><td>9.2° < θ ≤ ~~48~~19.1°</td></tr>
<tr><td>~~−24~~</td><td>~~dBW/4 kHz~~</td><td>~~for~~</td><td>~~48° < θ ≤ 85°~~</td></tr>
<tr><td>−14</td><td>dBW/4 kHz</td><td>for</td><td>~~85~~19.1° < θ ≤ 180°</td></tr>
</table>
where theta (θ) is the angle in degrees from the axis of the main lobe measured in the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3).</td>
<td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1).<br>SIA proposes to flatten the mask from 19.1 – 180°.</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>25.226(a)(1)(i)(B)</td><td>(B) In all directions other than along the GSO, the off-axis EIRP spectral-density for co-polarized signals emitted from the VMES shall not exceed the following values:<br>18−10log(N)−25logθ dBW/4kHz for 3.0° ≤θ ≤48°<br>−24−10log(N) dBW/4kHz for 48° <θ ≤85°<br>−14−10log(N) dBW/4kHz for 85° <θ ≤180°<br>where θ and N are defined in paragraph (a)(1)(i)(A) of this section. This off-axis EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the orbital location of the target satellite with the exception of the plane of the GSO as defined in paragraph (a)(1)(i)(A) of this section. For the purpose of this subsection, the envelope shall be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the gain envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.</td><td>(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:<br><table><tr><td>18 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤ θ ≤ 48°</td></tr><tr><td>−24 – 10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° < θ ≤ 85°</td></tr><tr><td>−14 – 10log(N)</td><td>dBW/4kHz</td><td>for</td><td>85° < θ ≤180°</td></tr></table>Where θ and N are 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 θ angles not included in that region, on each side of the line from the earth station to the target satellite.</td><td>(B) The off-axis EIRP spectral density of co-polarized signals shall not exceed the following values in the plane orthogonal to the local plane ~~fo~~ of the GSO arc, as defined in § 25.103:<br><table><tr><td>18 – 25logφ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤φ ≤ ~~48~~19.1°</td></tr><tr><td>−14</td><td>dBW/4kHz</td><td>for</td><td>~~85~~19.1° <φ ≤180°</td></tr></table>Where φ is the angle in degrees from the axis of the main lobe measured in the plane orthogonal to the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).</td><td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “plane orthogonal to the local plane of the GSO Arc” and the modified theta definition from 25.138(a)(1) for φ. SIA proposes to flatten the mask from 19.1 – 180°.</td></tr>
<tr><td>F.5 (62)</td><td>25.226(a)(1)(i)(C)</td><td>(C) In all directions, the off-axis EIRP spectral-density for cross-polarized signals emitted from the VMES shall not exceed the following values:<br>5−10log(N)−25logθ dBW/4kHz for 1.8° ≤θ ≤7.0°<br>−16−10log(N) dBW/4kHz for 7.0° <θ ≤9.2°</td><td>(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:<br><table><tr><td>5−10log(N)−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤ θ ≤7.0°</td></tr><tr><td>−16−10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>7.0° < θ ≤9.2°</td></tr></table></td><td>(C) The EIRP density of cross-polarized signals shall not exceed the following values:<br>(i) in the local plane of the GSO arc<br><table><tr><td>5−25logθ</td><td>dBW/4 kHz</td><td>for</td><td>1.8° ≤ θ ≤7.0°</td></tr></table></td><td>SIA proposes restricting cross pol to no greater than 7° and using “local plane of the GSO arc” and “plane orthogonal to the local plane</td></tr>
</table>

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| | | where θ and N are defined as set forth in paragraph (a)(1)(i)(A) of this section. This EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the target satellite. | where θ and N are as defined in paragraph (a)(1)(i)(A) of this section. | where θ is as defined in paragraph (a)(1)(i)(A) of this section.<br>(ii)In the plane orthogonal to the local plane of the GSO arc,<br>5−25log φ dBW/4 kHz for 1.8° ≤ φ ≤7.0°<br>where φ is defined in (a)(1)(i)(B) of this section. | of the GSO arc" and Theta and phi based on 25.138(a)(1) |
| | 25.226(a)(1)(i)(D) | (D) For non-circular VMES antennas, the major axis of the antenna shall 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.<br>***** | (D) For non-circular VMES antennas, the major axis of the antenna must be aligned with the plane tangent to the GSO arc to the extent required to meet the specified off-axis EIRP spectral density criteria.<br>* * * * * | Deletion | SIA proposes deletion See main section of comments for discussion. |
| | 25.226(a)(2) | 2) The following requirements shall apply to a VMES that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section. A VMES, or VMES system, operating under this subsection shall file certifications and provide a detailed demonstration as described in paragraph (b)(2) of this section.<br>(i) The VMES shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(2) of this section.<br>(ii) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the VMES operator shall accept the power-density levels that would accommodate that adjacent satellite.<br>(iii) The VMES shall operate in accordance with the off-axis EIRP | (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.<br>(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.<br>(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.<br>(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 | | SIA agrees with FCC proposal |

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| | | spectral-densities that the VMES supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(2) of this section. The VMES shall automatically cease emissions within 100 milliseconds if the VMES transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator. | 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 | | |
| F.21 (119) | 25.226(a)(3) Deletes redundant last sentence of 25.226(a)(3)(i) +(ii) | 3) The following requirements shall apply to a VMES system that uses variable power-density control of individual transmitting co-frequency VMES earth stations in the same satellite receiving beam. A VMES system operating under this subsection shall file certifications and provide a detailed demonstration as described in paragraph (b)(3) of this section.<br>(i) The effective aggregate EIRP-density from all terminals shall be at least 1 dB below the off-axis EIRP-density limits defined in paragraph (a)(1)(i) of this section, with the value of N=1. In this context the term "effective" means that the resultant co-polarized and cross-polarized EIRP-density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single transmitter operating 1 dB below the limits defined in paragraph (a)(1)(i) of this section. The individual VMES transmitter shall automatically cease emissions within 100 milliseconds if the VMES transmitter exceeds the off-axis EIRP-density limits minus 1 dB specified above. If one or more VMES transmitters causes the aggregate off-axis EIRP-densities to exceed the off- | (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.<br>(i) Aggregate EIRP density from terminals in the network toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits defined in paragraph (a)(1)(i) of this section, with the value of N = 1.<br>(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.<br>(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.<br>* * * * * | (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.<br><br>(i) aggregate EIRP density for 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 limit specified in paragraphs (a)(1)(i) of this section.<br><br>(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 | SIA supports deletion of last sentence in (a)(3)(i) as redundant with (a)(3) and (a)(3)(ii) as being redundant with (b)(3)<br><br>SIA proposes alternative text for 25.226(a)(3)(i); deleting all 10log(N) rules and associated 1dB rules. See Narrative text for rationale |

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| | | axis EIRP-density limits minus 1 dB specified above, then the transmitter or transmitters shall cease or reduce emissions within 100 milliseconds of receiving a command from the system's network control and monitoring center. A VMES system operating under this subsection shall provide a detailed demonstration as described in paragraph (b)(3)(i) of this section.<br>(ii) The following requirements shall apply to a VMES that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(3)(i) of this section. A VMES system operating under this section shall file certifications and provide a detailed demonstration as described in paragraphs (b)(3)(ii) and (b)(3)(iii) of this section.<br>(A) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the VMES shall operate at an EIRP-density defined in paragraph (a)(3)(i) of this section.<br>(B) The VMES shall operate in accordance with the off-axis EIRP spectral-densities that the VMES supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(3)(ii) of this section. The individual VMES terminals shall automatically cease emissions within 100 milliseconds if the VMES transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator. The overall system shall be capable of shutting off an individual transmitter or the entire | | of the limit in paragraph (a)(3)(i) of this section.<br>(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.<br>* * * * * | |

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| | | system if the aggregate off-axis EIRP spectral-densities exceed those supplied to the target satellite operator.<br>(C) The VMES shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(3) of this section. | | | |
| | 25.226(b) &(b)(1) | (b) Applications for VMES operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service shall include, in addition to the particulars of operation identified on Form 312, and associated Schedule B, the applicable technical demonstrations in paragraphs (b)(1), (2) or (3) of this section and the documentation identified in paragraphs (b)(4) through (8) of this section.<br>(1) A VMES applicant proposing to implement a transmitter under paragraph (a)(1) of this section shall demonstrate that the transmitter meets the off-axis EIRP spectral-density limits contained in paragraph (a)(1)(i) of this section. To provide this demonstration, the application shall include the tables | (b) Applications for VMES operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on 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.<br>(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). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section. 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 | (b) Applications for VMES operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on 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.<br>(1) A VMES applicant proposing to implement a transmitter under paragraph (a)(1) of this section must | SIA agrees with FCC proposal with deletion of sentence referring to N. |

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| | | described in paragraph (b)(1)(i) of this section or the certification described in paragraph (b)(1)(ii) of this section. The VMES applicant also shall provide the value N described in paragraph (a)(1)(i)(A) of this section. A VMES applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section shall provide the certifications identified in paragraph (b)(1)(iii) of this section. A VMES applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section shall provide the demonstrations identified in paragraph (b)(1)(iv) of this section. | must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.<br>* * * * * | 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.<br>* * * * * | |
| F.19 (109) | 25.226(b)(1)(i) remove and reserve | (i) Any VMES applicant filing an application pursuant to paragraph (a)(1) of this section shall file three tables showing the off-axis EIRP density level of the proposed earth station antenna in the direction of the plane of the GSO; the co-polarized EIRP density in the elevation plane, that is, the plane perpendicular to the plane of the GSO; and cross polarized EIRP density. Each table shall provide the EIRP density level at increments of 0.1° for angles between 0° and 10° off-axis, and at increments of 5° for angles between 10° and 180° off-axis.<br>(A) For purposes of the off-axis EIRP density table in the plane of the GSO, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the plane of the GSO is determined by the focal point of the antenna and the line tangent to the | reserved | | SIA agrees with FCC proposal |

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| | | arc of the GSO at the orbital position of the target satellite.<br>(B) For purposes of the off-axis co-polarized EIRP density table in the elevation plane, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the elevation plane is defined as the plane perpendicular to the plane of the GSO defined in paragraph (b)(1)(i)(A) of this section.<br>(C) For purposes of the cross-polarized EIRP density table, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite and the plane of the GSO as defined in paragraph (b)(1)(i)(A) of this section will be used. | | | |
| F.19 (109) | 25.226(b)(1)(ii) remove and reserve | (ii) A VMES applicant shall include a certification, in Schedule B, that the VMES antenna conforms to the gain pattern criteria of §25.209(a) and (b), that, combined with the maximum input power density calculated from the EIRP density less the antenna gain, which is entered in Schedule B, demonstrates that the off-axis EIRP spectral density envelope set forth in paragraphs (a)(1)(i)(A) through (C) of this section will be met under the assumption that the antenna is pointed at the target satellite. If an antenna proposed for use by the applicant does not comply with the antenna performance standards contained in §25.209(a) and (b), the applicant must provide, as an exhibit to its application, | reserved | | SIA agrees with FCC proposal |

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| | | antenna gain test plots pursuant to §25.132(b)(3). | | | |
| | 25.226(b)(3) | (3) A VMES applicant proposing to implement VMES system under paragraph (a)(3) of this section and using variable power-density control of individual simultaneously transmitting co-frequency VMES earth stations in the same satellite receiving beam shall provide the following certifications and demonstration as exhibits to its earth station application:<br>(i) The applicant shall make a detailed showing of the measures it intends to employ to maintain the effective aggregate EIRP-density from all simultaneously transmitting co-frequency terminals operating with the same satellite transponder at least 1 dB below the off-axis EIRP-density limits defined in paragraphs (a)(1)(i)(A) through (C) of this section. In this context the term “effective” means that the resultant co-polarized and cross-polarized EIRP-density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single VMES transmitter operating at 1 dB below the limits defined in paragraphs (a)(1)(i)(A) through (C) of this section. The applicant also must demonstrate that an individual transmitter and the entire VMES system is capable of automatically ceasing emissions within 100 milliseconds if the aggregate off-axis EIRP-densities exceed the off-axis EIRP-density limits minus 1 dB, as set forth in paragraph (a)(3)(i) of this section. The International Bureau will | (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:<br>(i) off-axis EIRP density data pursuant to § 25.115(g)(1);<br>(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;<br>(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<br>(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.<br>* * * * * | | SIA agrees with FCC proposal |

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| | | place this showing on public notice along with the application.<br>(ii) An applicant proposing to implement a VMES under paragraph (a)(3)(ii) of this section that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(3)(i) of this section shall provide the following certifications, demonstration and list of satellites as exhibits to its earth station application:<br>(A) A detailed showing of the measures the applicant intends to employ to maintain the effective aggregate EIRP-density from all simultaneously transmitting co-frequency terminals operating with the same satellite transponder at the EIRP-density limits supplied to the target satellite operator. The International Bureau will place this showing on public notice along with the application.<br>(B) A statement from the target satellite operator certifying that the proposed operation of the VMES has the potential to create harmful interference to satellite networks adjacent to the target satellite(s) that may be unacceptable.<br>(C) A statement from the target satellite operator certifying that the aggregate power density levels that the VMES applicant provided to the target satellite operator are consistent with the existing coordination agreements between its satellite(s) and the adjacent satellite systems within 6° of orbital separation from its satellite(s).<br>(D) A statement from the target satellite operator certifying that it will include the aggregate power-density levels of the VMES applicant in all future coordination agreements. | | | |

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<td>(E) A demonstration from the VMES operator that the VMES system is capable of detecting and automatically ceasing emissions within 100 milliseconds when an individual transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator and that the overall system is capable of shutting off an individual transmitter or the entire system if the aggregate off-axis EIRP spectral-densities exceed those supplied to the target satellite operator.<br>(F) An identification of the specific satellite or satellites with which the VMES system will operate.<br>(iii) The applicant shall acknowledge that it will maintain sufficient statistical and technical information on the individual terminals and overall system operation to file a detailed report, one year after license issuance, describing the effective aggregate EIRP-density levels resulting from the operation of the VMES system.</td>
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<td>F.5<br>(62)</td>
<td>25.227(a)(1)(i)(A)</td>
<td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(A) The off-axis EIRP spectral-density for co-polarized signals emitted from the ESAA, in the plane of the geostationary satellite orbit (GSO) as it appears at the particular earth station location, shall not exceed the following values:
<table>
<tr><td>15 - 10 $\log_{10}$ (N) - 25 $\log_{10}\theta$</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤θ ≤7°</td></tr>
<tr><td>-6 - 10 $\log_{10}$ (N)</td><td>dBW/4 kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
</table></td>
<td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(A) EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in § 25.103, must not exceed the following values:
<table>
<tr><td>15 - 10 $\log_{10}$ (N) - 25 $\log_{10}\theta$</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>-6 - 10 $\log_{10}$ (N)</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
<tr><td>18 - 10 $\log_{10}$ (N) - 25 $\log_{10}\theta$</td><td>dBW/4 kHz</td><td>For</td><td>9.2° < θ ≤ 48°</td></tr>
<tr><td>-24 - 10 $\log_{10}$ (N)</td><td>dBW/4 kHz</td><td>For</td><td>48° < θ ≤ 85°</td></tr>
</table></td>
<td>(a) * * *<br>(1) * * *<br>(i) * * *<br>(A) EIRP spectral density emitted in the local plane of the GSO arc, as defined in § 25.103, must not exceed the following values:
<table>
<tr><td>15 - 25 $\log_{10}$ θ</td><td>dBW/4 kHz</td><td>For</td><td>1.5° ≤ θ ≤ 7°</td></tr>
<tr><td>-6</td><td>dBW/4 kHz</td><td>For</td><td>7° < θ ≤ 9.2°</td></tr>
</table></td>
<td>SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current rules for sidelobe and backlobe allowances, and using “Local plane of the GSO Arc” and the theta definition from 25.138(a)(1).</td>
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| | | <table><tr><td>18 - 10 $\log_{10}$ (N) - 25 $\log_{10}\theta$</td><td>dBW/4 kHz</td><td>For</td><td>9.2° <θ ≤48°</td></tr><tr><td>-24 - 10 $\log_{10}$ (N)</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤85°</td></tr><tr><td>-14 - 10 $\log_{10}$ (N)</td><td>dBW/4 kHz</td><td>For</td><td>85° <θ ≤180°</td></tr></table> where theta (θ) is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite in the plane of the GSO. The plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital location of the target satellite. For ESAA networks using frequency division multiple access (FDMA) or time division multiple access (TDMA) techniques, N is equal to one. For ESAA networks using multiple co-frequency transmitters that have the same EIRP density, N is the maximum expected number of co-frequency simultaneously transmitting ESAA earth stations in the same satellite receiving beam. For the purpose of this subsection, the peak EIRP density of an individual sidelobe shall not exceed the envelope defined above for θ between 1.5° and 7.0°. For θ greater than 7.0°, the envelope shall be exceeded by no more than 10% of the sidelobes, provided no individual sidelobe exceeds the envelope given above by more than 3 dB. | <table><tr><td>-14 - 10 $\log_{10}$ (N)</td><td>dBW/4 kHz</td><td>For</td><td>85° < θ ≤ 180°</td></tr></table> where theta (θ) is the angle in degrees from a line from the earth station's antenna to the assigned orbital location of the target satellite. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. The EIRP density levels specified for θ > 7º may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180º. | <table><tr><td>18 - 25 $\log_{10}$ θ</td><td>dBW/ 4 kHz</td><td>For</td><td>9.2° < θ ≤ ~~48~~19.1°</td></tr><tr><td>~~-24~~</td><td>~~dBW/ 4 kHz~~</td><td>~~For~~</td><td>~~48° < θ ≤ 85°~~</td></tr><tr><td>-14</td><td>dBW/ 4 kHz</td><td>For</td><td>~~85~~19.1° < θ ≤ 180°</td></tr></table> where theta (θ) is the angle in degrees from the axis of the main lobe measured in the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(3). | SIA proposes to flatten the mask from 19.1 – 180°. |
| F.4 (61) | 25.227(a)(1)(i)(B) | (B) In all directions other than along the GSO, the off-axis EIRP spectral-density for co-polarized signals emitted from the ESAA shall not exceed the following values: | (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: <table><tr><td>18 – 10log(N) – 25logθ</td><td>dBW/4 kHz</td><td>for</td><td>3.0° ≤ θ ≤ 48°</td></tr></table> | (B) The EIRP spectral density of co-polarized signals must not exceed the following values in the plane orthogonal | SIA proposes deleting 10 log (N) rules and using combination of Rec 732-1 and current |

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<table>
<tr><td>18 - 10 $\log_{10}$ (N) - 25log $\log_{10}\theta$</td><td>dBW/4 kHz</td><td>For</td><td>3.0° ≤θ ≤48°</td></tr>
<tr><td>-24 - 10 $\log_{10}$ (N)</td><td>dBW/4 kHz</td><td>For</td><td>48° <θ ≤85°</td></tr>
<tr><td>-14 - 10 $\log_{10}$ (N)</td><td>dBW/4kHz</td><td>For</td><td>85° <θ ≤180°</td></tr>
</table>
where θ and N are defined in paragraph (a)(1)(i)(A). This off-axis EIRP spectral-density applies in any plane that includes the line connecting the focal point of the antenna to the orbital location of the target satellite with the exception of the plane of the GSO as defined in paragraph (a)(1)(i)(A) of this section. For the purpose of this subsection, the envelope shall be exceeded by no more than 10% of the sidelobes provided no individual sidelobe exceeds the EIRP density envelope given above by more than 6 dB. The region of the main reflector spillover energy is to be interpreted as a single lobe and shall not exceed the envelope by more than 6 dB.
</td>
<td>
<table>
<tr><td>−24 − 10log(N)</td><td>dBW/4 kHz</td><td>for</td><td>48° < θ ≤ 85°</td></tr>
<tr><td>−14 − 10log(N)</td><td>dBW/4kHz</td><td>for</td><td>85° < θ ≤ 180°</td></tr>
</table>
where θ and N are 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 θ angles not included in that region, on each side of the line from the earth station to the target satellite.
</td>
<td>
to the local plane of the GSO arc , as defined in § 25.103:
<table>
<tr><td>18 − 25log φ</td><td>dBW/ 4 kHz</td><td>for</td><td>3.0° ≤ φ ≤ ~~48~~19.1°</td></tr>
<tr><td>~~−24~~</td><td>~~dBW/ 4 kHz~~</td><td>~~for~~</td><td>~~48° < φ≤ 85°~~</td></tr>
<tr><td>−14</td><td>dBW/ 4kHz</td><td>for</td><td>~~85~~19.1° < φ ≤ 180°</td></tr>
</table>
where φ is the angle in degrees from the axis of the main lobe measured in the plane orthogonal to the local plane of the GSO arc. The off-axis EIRP density mask above , may be exceeded to the same extent allowed for by the off-axis gain mask in 25.209(a)(4).
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<td>rules for sidelobe and backlobe allowances, and using “plane orthogonal to the local plane of the GSO Arc” and the modified theta definition from 25.138(a)(1) for φ. SIA proposes to flatten the mask from 19.1 – 180°.</td>
</tr>
<tr>
<td>F.4 (61)</td>
<td>25.227(a)(1)(i)(C)</td>
<td>
(C) The off-axis EIRP spectral-density for cross-polarized signals emitted from the ESAA shall not exceed the following values:
<table>
<tr><td>5 - 10 $\log_{10}$ (N) - 25$\log_{10}\theta$</td><td>dBW/4kHz</td><td>For</td><td>1.8° <θ ≤7°</td></tr>
<tr><td>-16 - 10 $\log_{10}$ (N)</td><td>dBW/4kHz</td><td>For</td><td>7° <θ ≤9.2°</td></tr>
</table>
where θ and N are defined in paragraph (a)(1)(i)(A). This off-axis EIRP spectral-density applies in the plane of the geostationary satellite orbit as it
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<td>
(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:
<table>
<tr><td>5 - 10 $\log_{10}$ (N) - 25$\log_{10}\theta$</td><td>dBW/4kHz</td><td>For</td><td>1.8° < θ ≤ 7°</td></tr>
<tr><td>-16 - 10 $\log_{10}$ (N)</td><td>dBW/4kHz</td><td>For</td><td>7° < θ ≤9.2°</td></tr>
</table>
where θ and N are as defined in paragraph (a)(1)(i)(A) of this section.
* * * * *
</td>
<td>
C) The off-axis EIRP spectral-density of cross-polarized signals must not exceed the following values:
(i) in the local plane of the GSO arc
<table>
<tr><td>5 - 25$\log_{10}$ θ</td><td>dBW/ 4kHz</td><td>For</td><td>1.8° < θ ≤ 7°</td></tr>
</table>
</td>
<td>SIA proposes restricting cross pol to no greater than 7° and using “local plane of the GSO arc” and “plane orthogonal to the local plane of the GSO arc” and Theta and phi based on 25.138(a)(1)</td>
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| | | appears at the particular earth station location.<br>*****<br><br>(2) The following requirements shall apply to an ESAA, or ESAA system, that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section. An ESAA, or ESAA network, operating under this subsection shall file certifications and provide a detailed demonstration as described in paragraph (b)(2) of this section.<br>(i) The ESAA shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(2) of this section.<br>(ii) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the ESAA operator shall accept the power-density levels that would accommodate that adjacent satellite.<br>(iii) The ESAA shall operate in accordance with the off-axis EIRP | | where θ is as defined in paragraph (a)(1)(i)(A) of this section.<br>(ii) In the plane orthogonal to the local plane of the GSO arc,<br>$5 - 25\log_{10}\varphi$ dBW/4kHz for $1.8° < \varphi \leq 7°$<br><br>where φ is defined in (a)(1)(i)(B) of this section.<br><br>* * * * * | |
| | 25.227(a)(2) | (2) The following requirements shall apply to an ESAA, or ESAA system, that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section. An ESAA, or ESAA network, operating under this subsection shall file certifications and provide a detailed demonstration as described in paragraph (b)(2) of this section.<br>(i) The ESAA shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(2) of this section.<br>(ii) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the ESAA operator shall accept the power-density levels that would accommodate that adjacent satellite.<br>(iii) The ESAA shall operate in accordance with the off-axis EIRP | (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.<br>(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.<br>(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.<br>(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 | | SIA agrees with FCC proposal k |

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| | | spectral-densities that the ESAA supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(2) of this section. The ESAA shall automatically cease emissions within 100 milliseconds if the ESAA transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator and transmission shall not resume until ESAA conforms to the off-axis EIRP spectral densities supplied to the target satellite operator.<br>(iv) In the event that a coordination agreement discussed in paragraph (b)(2)(ii) of this section is reached, but that coordination agreement does not address protection from interference for the earth station, that earth station will be protected from interference to the same extent that an earth station that meets the requirements of §25.209 of this title would be protected from interference. | 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. | | |
| F.21 (119) | 25.227(a)(3) Deletes redundant last sentence of 25.227(a)(3)(i)&(ii) | (3) The following requirements shall apply to an ESAA system that uses variable power-density control of individual simultaneously transmitting co-frequency ESAA earth stations in the same satellite receiving beam. An ESAA system operating under this subsection shall provide a detailed demonstration as described in paragraph (b)(3) of this section.<br>(i) The effective aggregate EIRP density from all terminals shall be at least 1 dB below the off-axis EIRP density limits defined in paragraph (a)(1)(i)(A) through (C), with the value of N=1. In this context the term “effective” means that | (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.<br>(i) Aggregate EIRP density from ESAA terminals toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits specified in paragraph (a)(1)(i) of this section, with the value of N = 1.<br>(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. | (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.<br><br>(i) aggregate EIRP density for co frequency earth stations in each target satellite receiving beam, not resulting from | SIA supports deletion of last sentence in (a)(3)(i) as redundant with (a)(3) and (a)(3)(ii) as being redundant with (b)(3)<br>SIA proposes alternative text for 25.227(a)(3)(i) to address aggregate off axis EIRP density and deleting all 10log(N) rules and |

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| | | the resultant co-polarized and cross-polarized EIRP density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single transmitter operating 1 dB below the limits defined in paragraph (a)(1)(i)(A) through (C). The individual ESAA transmitter shall automatically cease emissions within 100 milliseconds if the ESAA transmitter exceeds the off-axis EIRP density limits minus 1 dB specified above. If one or more ESAA transmitters causes the aggregate off-axis EIRP-densities to exceed the off-axis EIRP density limits minus 1dB specified above, then the transmitter or transmitters shall cease or reduce emissions within 100 milliseconds of receiving a command from the system's network control and monitoring center. An ESAA system operating under this subsection shall provide a detailed demonstration as described in paragraph (b)(3)(i) of this section.<br>(ii) The following requirements shall apply to an ESAA that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(3)(i) of this section. An ESAA system operating under this subsection shall file certifications and provide a detailed demonstration as described in paragraphs (b)(3)(ii) and (b)(3)(iii) of this section.<br>(A) If a good faith agreement cannot be reached between the target satellite operator and the operator of a future satellite that is located within 6 degrees longitude of the target satellite, the ESAA shall operate at an EIRP density defined in (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.<br>* * * * * | colliding data bursts transmitted pursuant to a contention protocol, will not exceed the limit specified in paragraphs (a)(1)(i) of this section.<br>(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.<br>(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.<br>* * * * * | associated 1dB rules. |

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| | | (B) The ESAA shall operate in accordance with the off-axis EIRP spectral-densities that the ESAA supplied to the target satellite operator in order to obtain the certifications listed in paragraph (b)(3)(ii) of this section. The individual ESAA terminals shall automatically cease emissions within 100 milliseconds if the ESAA transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator. The overall system shall be capable of shutting off an individual transmitter or the entire system if the aggregate off-axis EIRP spectral-densities exceed those supplied to the target satellite operator.<br>(C) The ESAA shall transmit only to the target satellite system(s) referred to in the certifications required by paragraph (b)(3) of this section. | | | |
| | 25.227(b) & (b)(1) Add Requires 25.115(g)(1) information | (b) Applications for ESAA operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service shall include, in addition to the particulars of operation identified on 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.<br>(1) An ESAA applicant proposing to implement a transmitter under paragraph (a)(1) of this section shall demonstrate that the transmitter meets the off-axis EIRP spectral-density limits contained in paragraph (a)(1)(i) of this section. To provide this demonstration, the application shall include the tables | (b) Applications for ESAA operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service shall include, in addition to the particulars of operation identified on 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.<br>(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). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section. 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 | (b) Applications for ESAA operation in the 14.0-14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service shall include, in addition to the particulars of operation identified on 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.<br>(1) An ESAA applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information | SIA agrees with FCC proposal with modification to delete sentence referring to N. |

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| | | described in paragraph (b)(1)(i) of this section or the certification described in paragraph (b)(1)(ii) of this section. The ESAA applicant also shall provide the value N described in paragraph (a)(1)(i)(A) of this section. An ESAA applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section shall provide the certifications identified in paragraph (b)(1)(iii) of this section. An ESAA applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section shall provide the demonstrations identified in paragraph (b)(1)(iv) of this section. | must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.<br>* * * * * | 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.<br>* * * * * | |
| F.19 (109) | 25.227(b)(1)(i) remove and reserve | (i) Any ESAA applicant filing an application pursuant to paragraph (a)(1) of this section shall file three tables and/or graphs depicting off-axis EIRP density masks defined by §25.227(a) and measured off-axis EIRP density levels of the proposed earth station antenna in the direction of the plane of the GSO; the co-polarized EIRP density in the elevation plane, that is, the plane perpendicular to the plane of the GSO; and cross-polarized EIRP density. Each table shall provide the EIRP density level at increments of 0.1° for angles between 0° and 10° off-axis, and at increments of 5° for angles between 10° and 180° off-axis.<br>(A) For purposes of the off-axis EIRP density table in the plane of the GSO, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the plane of the GSO is determined by the focal point of | reserved | | SIA agrees with FCC proposal. |

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| | | the antenna and the line tangent to the arc of the GSO at the orbital position of the target satellite.<br>(B) For purposes of the off-axis co-polarized EIRP density table in the elevation plane, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the elevation plane is defined as the plane perpendicular to the plane of the GSO defined in paragraph (b)(1)(i)(A) of this section.<br>(C) For purposes of the cross-polarized EIRP density table, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite and the plane of the GSO as defined in paragraph (b)(1)(i)(A) of this section will be used. | | | |
| F.19 (109) | 25.227(b)(1)(ii) remove and reserve | (ii) An ESAA applicant shall include a certification, in Schedule B, that the ESAA antenna conforms to the gain pattern criteria of §25.209(a) and (b), that, combined with the maximum input power density calculated from the EIRP density less the antenna gain, which is entered in Schedule B, demonstrates that the off-axis EIRP spectral density envelope set forth in paragraphs (a)(1)(i)(A) through (a)(1)(i)(C) of this section will be met under the assumption that the antenna is pointed at the target satellite. | reserved | | SIA agrees with FCC proposal |
| | 25.227(b)(3) | (3) An ESAA applicant proposing to implement an ESAA system under paragraph (a)(3) of this section and using variable power-density control of | (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: | | SIA agrees with FCC proposal |

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| | | individual simultaneously transmitting co-frequency ESAA earth stations in the same satellite receiving beam shall provide the following certifications and demonstration as exhibits to its earth station application:<br>(i) The applicant shall make a detailed showing of the measures it intends to employ to maintain the effective aggregate EIRP density from all simultaneously transmitting co-frequency terminals operating with the same satellite transponder at least 1 dB below the off-axis EIRP density limits defined in paragraphs (a)(1)(i)(A) through (C) of this section. In this context the term “effective” means that the resultant co-polarized and cross-polarized EIRP density experienced by any GSO or non-GSO satellite shall not exceed that produced by a single ESAA transmitter operating at 1 dB below the limits defined in paragraphs (a)(1)(i)(A) through (C) of this section. The ESAA applicant also shall provide a detailed showing that one or more transmitters are capable of automatically ceasing or reducing emissions within 100 milliseconds of receiving a command from the system's network control and monitoring center that the aggregate off-axis EIRP spectral-densities of the transmitter or transmitters exceed the off-axis EIRP-density limits specified in paragraph (a)(3)(i) of this section. The International Bureau will place this showing on public notice along with the application.<br>(ii) An applicant proposing to implement an ESAA system under paragraph (a)(3)(ii) of this section that uses off-axis | (i) off-axis EIRP density data pursuant to § 25.115(g)(1);<br>(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;<br>(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<br>(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.<br>* * * * * | | |

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| | | EIRP spectral-densities in excess of the levels in paragraph (a)(3)(i) of this section shall provide the following certifications, demonstration and list of satellites as exhibits to its earth station application:<br>(A) A detailed showing of the measures the applicant intends to employ to maintain the effective aggregate EIRP density from all simultaneously transmitting co-frequency terminals operating with the same satellite transponder at the EIRP density limits supplied to the target satellite operator. The International Bureau will place this showing on Public Notice along with the application.<br>(B) A statement from the target satellite operator certifying that the proposed operation of the ESAA has the potential to create harmful interference to satellite networks adjacent to the target satellite(s) that may be unacceptable.<br>(C) A statement from the target satellite operator certifying that the aggregate power-density levels that the ESAA applicant provided to the target satellite operator are consistent with the existing coordination agreements between its satellite(s) and the adjacent satellite systems within 6° of orbital separation from its satellite(s).<br>(D) A statement from the target satellite operator certifying that it will include the aggregate power-density levels of the ESAA applicant in all future coordination agreements.<br>(E) A demonstration from the ESAA operator that the ESAA system is capable of detecting and automatically ceasing emissions within 100 | | | |

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| | | milliseconds when an individual transmitter exceeds the off-axis EIRP spectral-densities supplied to the target satellite operator and that the overall system is capable of shutting off an individual transmitter or the entire system if the aggregate off-axis EIRP spectral-densities exceed those supplied to the target satellite operator.<br>(F) An identification of the specific satellite or satellites with which the ESAA system will operate. | | | |
| T.5 (177) | 25.264(a) | (a) Each applicant for a space station license in the 17/24 GHz broadcasting-satellite service (BSS) must provide a series of tables or graphs with its application, that contain the predicted transmitting antenna off-axis gain information for each transmitting antenna in the 17.3-17.8 GHz frequency band. 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 must provide the predicted transmitting antenna off-axis antenna gain information:<br>*** | (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: * * * | | SIA agrees with FCC proposal |
| T.5 (177) | 25.264(a)(5) | (5) Over a greater angular measurement range, if necessary, to account for any planned spacecraft orientation bias or change in operating orientation relative | (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 | | SIA agrees with FCC proposal |

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| | | to the reference coordinate system. The applicant must also explain its reasons for doing so. | applicant or licensee must state the reasons for including such additional information. | | |
| T.5 (177) | 25.264(a)(6) add | | (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. | | SIA agrees with FCC proposal |
| T.5 (177) | 25.264(b) | (b) Each applicant for a space station license in the 17/24 GHz BSS must provide power flux density (pfd) calculations with its application that are based upon the predicted off-axis transmitting antenna gain information submitted in accordance with paragraph (a) of this section, as follows: | (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: | | SIA agrees with FCC proposal |
| T.5 (177) | 25.264(b)(2) | (2) * * *<br>(ii) Demonstrate the extent to which the applicant's transmissions in the 17.3-17.8 GHz band exceed the threshold pfd level of −117 dBW/m2/100 kHz at those prior-filed U.S. DBS space station locations. | (2) * * *<br>(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/$m^2$/100 kHz at those prior-filed U.S. DBS space station locations. | | SIA agrees with FCC proposal |
| T.5. (178) | 25.264(b)(3) | (3) If the calculated pfd level is in excess of the threshold level of −117 dBW/m2/100 kHz at the location of any prior-filed U.S. DBS space station, the applicant must also provide with its application certification that all affected DBS operators acknowledge and do not object to the applicants higher off-axis pfd levels. No such certification is required in cases where the DBS and 17/24 GHz BSS assigned operating frequencies do not overlap. | (3) If the calculated pfd exceeds the threshold level of −117 dBW/$m^2$/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. * * * | | SIA agrees with FCC proposal |
| T.5 (179) | 25.264(c) | (c) No later than 9 months prior to launch, each 17/24 GHz BSS space station applicant or authorization holder must confirm the predicted | (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) | | See main section of comments for discussion. |

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| | | transmitting antenna off-axis gain information provided in accordance with §25.114(d)(15)(iv) by submitting measured transmitting antenna off-axis gain information over the angular ranges, measurement frequencies and polarizations described in paragraphs (a)(1) through (5) of this section. The transmitting antenna off-axis gain information should be measured under conditions as close to flight configuration as possible. | 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) through (5) above. * * * | (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 performance over the angular ranges, measurement frequencies and polarizations specified in paragraphs (a)(1) through (5) above. The transmitting antenna off-axis gain measured performance should represent the performance that would be expected to occur under flight configuration and technical rationale for the measured performance should accompany the results. Should measurements over the full extent of specified angular ranges not be technically feasible, measured data shall be supplemented with simulated data covering all of the angular ranges specified in paragraphs (a)(1) through(a)(5) above. | |
| T.5 (179) | 25.264(d) | (d) No later than 9 months prior to launch, each 17/24 GHz BSS space station applicant or authorization holder | (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 | | SIA agrees with FCC proposal |

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| | | must provide pfd calculations based upon the measured transmitting antenna off-axis gain information that is submitted in accordance with paragraph (c) of this section as follows: | 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: | | |
| T.5 (179) | 25.264(d)(1)(ii) | (1) * * *<br>(ii) At the location of any subsequently-filed U.S. DBS space station where the applicant's pfd level in the 17.3-17.8 GHz band exceeds the coordination trigger of −117 dBW/m2/100 kHz. In this rule, the term subsequently-filed U.S. DBS space station refers to any Direct Broadcast Satellite service space station application that was filed with the Commission (or authorization granted by the Commission) after the 17/24 GHz BSS operator submitted the predicted data required by paragraphs (a) through (b) of this section, but prior to the time the 17/24 GHz BSS operator submitted the measured data required in this paragraph. Subsequently-filed U.S. DBS space stations may include foreign-licensed DBS space stations seeking authority to serve the United States market. The term does not include any applications (or authorizations) that have been denied, dismissed, or are otherwise no longer valid, nor does it include foreign-licensed DBS space stations that have not filed applications with the Commission for market access in the United States.<br>***** | (1) * * *<br>(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$^2$/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. * * *<br>* * * * * | | SIA agrees with FCC proposal |
| n/a | 25.271(c)(5)<br><br>SIA proposal to amend to | (5) International VSAT system operators are required to maintain a control point within the United States, or to 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 VSAT network immediately upon notification | | 25.271(c)(5) International operators of blanket licensed earth station networks are required to maintain a control point within the United States, or to maintain a point of contact within the United States available 24 hours a | SIA proposes text modifications consequential to deletion of 25.134 |

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| | delete VSAT | of harmful interference. | | day, 7 days a week, with the ability to shut off any earth station within the network immediately upon notification of harmful interference. | |
| AA.3. (196) | 25.275 (e) add | | * * * * *<br>(e) Transmission from an earth station of an unmodulated carrier at a power level sufficient to saturate a satellite transponder is prohibited, except by the space station licensee to determine transponder performance characteristics. | | SIA agrees with FCC proposal. |
| BB. (199) | 25.283(c) FCC invites comment on changing "and"to "or" other appropriate measures; also request comments on alternative requirements for pressure vessels that cannot be completely discharged. Eg max permitted level of stored energy for inert gases at a specified temperature. | c) *All space stations.* Upon completion of any relocation authorized by paragraph (b) of this section, or any relocation at end-of-life specified in an authorization, or upon a spacecraft otherwise completing its authorized mission, a space station licensee shall 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. | | c) *All space stations.* Upon completion of any relocation authorized by paragraph (b) of this section, or any relocation at end-of-life specified in an authorization, or upon a spacecraft otherwise completing its authorized mission, a space station licensee shall 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, or other appropriate measures. | SIA agrees with FCC comment to change "and" to "or". |

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| T.4 (176) | 25.288 add title and provision Move from 25.147 | | § 25.288 Obligation to remedy interference caused by NGSO MSS feeder downlinks in the 6700-6875 MHz band.<br>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 licensee has an obligation to remedy the interference. | | SIA agrees with the FCC proposal. |