

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
2000 Biennial Regulatory Review --)	IB Docket No. 00-248
Streamlining and Other Revisions of)	
Part 25 of the Commission's Rules)	
Governing the Licensing of, and)	
Spectrum Usage by, Satellite Network)	
Earth Stations and Space Stations)	
)	

**REPLY TO COMMENTS ON THE PETITION
FOR PARTIAL RECONSIDERATION
OF THE BOEING COMPANY**

The Boeing Company (“Boeing”), by its attorneys and pursuant to Section 1.429 of the Commission’s rules, 47 C.F.R. § 1.429, hereby files this Reply to Comments submitted in response to Boeing’s Petition for Partial Reconsideration^{1/} of the *Sixth Report and Order* in the above-captioned proceeding.^{2/}

Intelsat, Ltd. (“Intelsat”), the only party submitting comments on Boeing’s Petition, supports Boeing’s suggestion that the Commission increase the angle at which the off-axis e.i.r.p. density mask for earth stations on board vessels (“ESVs”) commences

^{1/} Petition for Partial Reconsideration of The Boeing Company, IB Docket No. 00-248, at 5-9 (filed July 8, 2005) (“Petition”).

^{2/} 2000 Biennial Regulatory Review – Streamlining and Other Revisions of Part 25 of the Commission’s Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth and Space Stations, IB Docket No. 00-248, *Sixth Report and Order and Third Further Notice of Proposed Rulemaking*, FCC 05-62 (rel. March 15, 2005) (“*Sixth Report and Order*” or “*Third Further NPRM*”).

from 1.25° to 1.5° or 2.0°, depending on how the ESV operator takes into account ESV pointing errors.^{3/} The Commission should adopt Boeing’s unopposed proposal.

As discussed in its related ESV proceeding, the Commission should also adopt the European Telecommunications Standards Institute (“ETSI”) proposed tracking and automatic cessation of ESV transmissions requirements found in Draft ETSI EN 302 340, which will protect other spectrum users from harmful interference while encouraging manufacturers to design ESVs with the fastest possible detection and response times. Finally, the Commission should clarify the appropriate method for calculating aggregate off-axis e.i.r.p. density for ESV transmissions to allow for bandwidth-on-demand type services.

I. THE COMMISSION SHOULD MODIFY THE STARTING ANGLE OF THE ANTENNA GAIN PATTERN FOR ESVS

In its Petition, Boeing urged the Commission to modify the starting angle of the antenna gain pattern for ESVs by increasing the angle at which the mask commences from 1.25° to 1.5° or 2.0°, depending on how the ESV operator takes into account ESV pointing errors.^{4/} In its comments, Intelsat agrees with Boeing, and references the comments that it submitted to the Commission in the concurrent ESV proceeding.^{5/}

^{3/} See Comments of Intelsat, Ltd., IB Docket No. 00-248, at 2 (filed November 10, 2005) (“Intelsat Comments”).

^{4/} Boeing also proposed to include two off-axis e.i.r.p. density entries ($48^\circ < \theta \leq 85^\circ$ and $85^\circ < \theta \leq 180^\circ$), rather than a single $\theta > 48^\circ$ entry in accordance with the Commission’s proposed VSAT mask in the *Third Further NPRM* at ¶¶ 119-24. The Commission has proposed a more permissive off-axis e.i.r.p. density level for angles of $85^\circ < \theta \leq 180^\circ$ because of the reduced impact of off-axis e.i.r.p. density to satellites located at these large angular separations. ESVs should obtain the same operational flexibility associated with the less restrictive off-axis e.i.r.p. density requirements afforded to Ku-band VSAT terminals.

^{5/} Intelsat Comments at 2.

In the ESV proceeding, Intelsat urged the Commission to extend the starting angle of the ESV off-axis e.i.r.p. density envelope for both C- and Ku-band systems in order to insure consistency of the Commission's rules and facilitate the use of smaller ESVs while, at the same time, protecting adjacent satellite operations.^{6/} Both Intelsat and Boeing agree that the existing 1.25 ° starting angle—the very angle that the Commission revised and extended for Ku-band VSATs^{7/}—reflects an overly conservative approach that undermines, rather than encourages, flexible and efficient use of spectrum. Where mispointing is limited to 0.2°, as is the case with ESVs, there is no need to be as conservative in selecting the starting angle of the off-axis e.i.r.p. envelope as long as the mispointing limit is enforced.^{8/}

Boeing, as a Ku-band ESV proponent, and Intelsat, as a satellite operator, are representative of the universe of parties affected by this proposed change in the rules. No party has expressed any opposition in this proceeding to Boeing's and Intelsat's request. The Commission should therefore reconsider its decision in the *Sixth Report and Order* as requested by Boeing in its Petition.

^{6/} See Intelsat Comments at 2-3; Opposition and Comments of Intelsat, Ltd., IB Docket No. 02-10, at 18-21 (filed April 21, 2005) (Opposition and Comments of Intelsat").

^{7/} *Sixth Report and Order* at ¶ 22. The Commission stayed the effective date of this rule revision until its pending resolution of off-axis e.i.r.p. issues raised in the *Third Further NPRM* in this proceeding. See *id.* ¶ 50. The revisions proposed by Boeing and Intelsat can be considered independently of the pending off-axis e.i.r.p. issues.

^{8/} See Intelsat Comments at 3; Opposition and Comments of Intelsat at 19.

II. THE COMMISSION SHOULD ADOPT THE ETSI APPROACH TO ANTENNA TRACKING AND CESSATION OF EMISSIONS

As Intelsat recognized in its comments, the issues raised in this proceeding are closely linked to those at issue in the Commission's ESV proceeding.^{9/} One issue of particular relevance in both dockets is that of requirements relating to ESV tracking and cessation of emissions. Boeing submits that the Commission should revise section 25.222(a)(7) to allow, in addition to its 100 millisecond response time requirement, the proposed ETSI standards for response time and cessation of transmissions.

The Commission's approach does not reflect tracking technology limitations and current trends in the regulation of ESVs. In particular, the 100 millisecond response time for termination of ESV transmissions after a tracking accuracy exceedance may be unrealistic for tracking methods in use today for ESVs, such as "dish scan." The Commission should revise section 25.222(a)(7) of its rules to allow, in addition to the 100 millisecond cessation of emissions standard currently found in that section, use of the approach embodied in the proposed tracking requirement for automatic cessation of ESV transmissions found in section 4.6.4.2 of Draft ETSI EN 302 340.^{10/}

The ETSI approach would require ESV manufacturers to declare a threshold tracking error ($\delta\phi$) and a response time (T), which may not exceed five seconds. The

^{9/} Intelsat Comments at 2 n.8.

^{10/} Petition for Partial Clarification Or Reconsideration of The Boeing Company, IB Docket No. 02-10, at 18-22 (filed March 2, 2005). In that proceeding, Boeing offered three possible solutions to the problem: (1) clarify that the time for automatic cessation of ESV transmissions set forth in section 25.222(a)(7) is measured from the time of detection of the tracking exceedance; (2) increase the time permitted for cessation of ESV transmissions from 100 milliseconds to three seconds; or (3) adopt a flexible tracking requirement such as that set forth in ETSI EN 302 340. As discussed herein, adopting the latter approach as a permissible alternative to the current section 25.222(a)(7) requirement would maximize error reduction within existing technological limitations.

ESV is then required to detect and respond to a tracking error that exceeds $\delta\phi$ by ceasing transmissions within T seconds. The ESV may not resume transmitting until the tracking error remains within the threshold for 2T seconds. Furthermore, section 4.2.3.2 of Draft ETSI EN 302 340 incorporates tracking error threshold $\delta\phi$ into the off-axis e.i.r.p. requirement such that the off-axis mask is lowered in proportion to $\delta\phi$.

The 2T penalty imposed by section 4.6.4.2 will encourage manufacturers to design ESVs with the fastest possible tracking times. The off-axis e.i.r.p. requirement imposed by section 4.2.3.2 would ensure that the off-axis mask will always be met for tracking errors less than $\delta\phi$, and would encourage manufacturers to design ESVs with the smallest possible tracking error. Together, these requirements promote the lowest possible tracking error and detection and response times without increasing the potential for interference to adjacent satellites (because the off-axis mask is lowered in proportion tracking error threshold) *and* without imposing potentially unrealistic response parameters on ESVs. Furthermore, by allowing the use of the ETSI approach—with which ESV operators will be required to comply in Europe—in addition to the 100 millisecond rule, the Commission would avoid imposing burdensome and disparate U.S. operating requirements on inherently international ESV systems. Boeing respectfully suggests that the Commission revise section 25.222(a)(7) to allow, as an alternative to the 100 millisecond cessation of emissions standard currently found in that section, use of the ETSI standards for response time and cessation of transmissions.

III. THE COMMISSION SHOULD CLARIFY THE CALCULATION OF AGGREGATE OFF-AXIS E.I.R.P. DENSITY OF ESV TRANSMISSIONS

Boeing further requested in the Petition that the Commission reconsider the methodology adopted in the *Sixth Report and Order* for calculating the aggregate off-axis

e.i.r.p. density of simultaneously transmitting ESV terminals by eliminating the restriction in Section 25.222(a)(1) and (2) of the rules relating to the calculation of aggregate levels, and instead clarifying that the division of aggregate power density is merely an example and that other methodologies are permissible so long as the aggregate levels are satisfied. No party has opposed Boeing's request for reconsideration of this issue.

As noted in the Petition, the requirement adopted by the Commission in the *Sixth Report and Order* that the aggregate power density of simultaneously transmitting terminals be split evenly among all transmitting terminals represents an unsupported and inappropriate reversal of the Commission policy previously articulated in the *ESV Order*,^{11/} despite the fact that the *ESV Order* itself expressed a clear intention to allow for greater flexibility in calculating aggregate power levels.^{12/} The *Sixth Report and Order* approach, if left in place, would preclude bandwidth-on-demand systems by preventing operators from accounting fully for the varying capacity needs of individual ESV terminals.^{13/} The Commission should clarify its rules as requested by Boeing because it is vital to afford ESV systems the operational flexibility needed to implement bandwidth-

^{11/} Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and the 14.0-14.5 GHz/11.7-12.2 GHz Bands, *Report and Order*, 20 FCC Rcd 674 (2005) ("*ESV Order*").

^{12/} While language of the *ESV Order* expressed a clear intention to allow flexibility in calculating aggregate power, the text of the rule actually adopted by the Commission would benefit from clarification by the Commission that there are other means available for calculating aggregate off-axis e.i.r.p. than simply dividing the aggregate power limit equally among all simultaneously transmitting ESVs. *See* Petition at 3-4.

^{13/} The Boeing Company, IB Docket No. 02-10, Petition for Partial Clarification or Reconsideration, at 16-18 (filed March 2, 2005).

on-demand services and dynamically allocate power to individual ESV terminals based on the capacity requirements of those terminals at any given point in time.

IV. CONCLUSION

For all of the foregoing reasons, the Commission should revise its rules governing ESV operations as set forth in Boeing's Petition.

Respectfully submitted,

THE BOEING COMPANY

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CERTIFICATE OF SERVICE

I, Robert G. Kidwell, certify that on this 21st day of November, 2005, I served a true and correct copy of the foregoing Reply to Comments on the following persons in the manner indicated:

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