

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

In the Matter of)	
)	
Amendment of Parts 2 and 25 of the)	ET Docket No. 98-206
Commission's Rules to Permit Operation of)	
NGSO FSS Systems Co-Frequency with)	
GSO and Terrestrial Systems in the)	
Ku-Band Frequency Range)	

OPPOSITION TO PETITION FOR RECONSIDERATION

PanAmSat Corporation ("PanAmSat"), by its attorneys, hereby submits this opposition to the Petition for Reconsideration filed by SkyBridge L.L.C ("SkyBridge") in the above-captioned proceeding.

INTRODUCTION AND SUMMARY

In the First Report and Order ("R&O"), the Commission determined that it would permit non-geostationary satellite orbit ("NGSO") fixed-satellite service ("FSS") providers to share frequencies in the Ku-band with geostationary satellite orbit ("GSO") FSS systems. In order to promote and facilitate such band sharing, the Commission adopted a number of technical and operational limits relating to NGSO use of the band. PanAmSat and others, including SkyBridge, filed petitions for reconsideration of the R&O. Although PanAmSat is in general agreement with many of the points made by others in their petitions, notably DIRECTV, PanAmSat opposes the petition filed by SkyBridge.

First, as PanAmSat noted in its petition for reconsideration, the requirement that NGSO licensees demonstrate compliance with the "operational" and "additional operational" limits only 90 days prior to being placed into service is inadequate. By that time, most or all of the satellites comprising the NGSO system in question will be

constructed. It is unlikely, therefore, that the Commission will have any substantial leverage to insist upon design or operational changes to ensure compliance with the spectrum sharing limits. Instead, the Commission should require applicants to demonstrate compliance with the additional operational limits prior to licensing and with the operational limits within 90 days of the launch of the first satellite in the constellation.

SkyBridge, on the other hand, argues that the Commission should eliminate its requirement for any pre-operational showing of compliance with the operational limits and the additional operational limits. This proposal, if adopted, would make sharing of spectrum between GSO and NGSO systems problematic and uncertain. As the Commission implicitly recognized in the R&O, the operational and additional operational limits are critically important in protecting GSO FSS systems and their customers from harmful NGSO interference. Compliance with those limits cannot depend solely upon post-operational remedial measures.

Second, the ability of GSO systems to operate co-frequency with NGSO systems will depend on the *aggregate* interference caused by all NGSO systems, not those of any single licensee. Nonetheless, SkyBridge advocates a highly limited application of aggregate EPFD_{down} limits, suggesting that the Commission refrain from even addressing this issue at present. Such an approach would be detrimental to the prospects for sharing between GSO and NGSO systems. Contrary to the suggestion of SkyBridge, the Commission should vigorously enforce aggregate EPFD_{down} limits using methodologies for which there is already a broad consensus.

Third, SkyBridge relies upon the lack of definitive “worst case” test points as a justification for scaling back the Commission’s testing requirement. No such retreat is warranted, however. The Commission’s required showings were established to ensure that NGSO systems operate without causing harmful interference to others in the band. The most effective means of accomplishing that end is not to establish a single inflexible

definition of the “worst case” test points for all occasions, but rather to allow potentially affected parties to submit test points of concern for evaluation.

Finally, the existing Part 25 off-axis EIRP limits are better crafted and more restrictive than the limits recommended at WRC-2000. The Commission should, therefore, refrain from substituting the WRC-2000 off-axis EIRP limits for the Part 25 limits that are already in effect.

DISCUSSION

I. The Commission Should Require An Early Demonstration Of Compliance With The Operational And Additional Operational Limits.

As PanAmSat and DIRECTV both have demonstrated, it is imperative that the Commission vigorously enforce NGSO interference limits. For that reason, PanAmSat asked that the Commission reconsider its rule allowing NGSO FSS licensees up to 90 days prior to the initiation of service before providing relevant compliance data. By that point, the Commission will have very limited flexibility in taking remedial steps to enforce its rules. PanAmSat therefore suggested that the Commission require demonstration of compliance with the operational and additional operational limits as early as possible. Indeed, NGSO systems should not even be licensed until the applicant can demonstrate compliance at least with the additional operational limits.

SkyBridge, on the other hand, urges the Commission to eliminate any pre-operational compliance requirement with regard to the operational and additional operational limits.¹ Indeed, SkyBridge maintains that the limits have no theoretical relevance at all, and that they “may be exceeded by definition,” so long as they are not exceeded into any actual operational GSO earth station.

More than a “trust us” regime is needed, however, to protect the nation’s multibillion dollar investment in GSO FSS systems, and to enforce the limits that are

¹ SkyBridge Petition at 33.

designed to protect those systems from destructive interference. GSO earth stations are not geographically limited and they may, therefore, be found virtually anywhere in the world. Thus, in order for the Commission to be able to certify to the ITU that NGSO licensees will stay within applicable limits, the Commission needs to require NGSO applicants to demonstrate compliance with the limits in advance of service. Otherwise, as SkyBridge itself acknowledges, a situation could arise in which an operational NGSO system was operating in excess of those limits.

Contrary to SkyBridge's suggestion, the fact that an NGSO system satisfies the validation limits is no guarantee against it violating the operational limits. Rather, because NGSO operators have provided limited information regarding their actual operational parameters, the Commission and other interested parties cannot make informed predictions about the interference that operational NGSO systems are likely to produce.

In any event, it is not enough that, as suggested by SkyBridge, an NGSO operator might "commit, as part of the licensing process, to meeting the [operational and] additional operational limits once in service."² If there is no technical basis for such a commitment, it is pure speculation and of little practical import. If there is a technical basis for such a claim, it should be provided to the Commission and interested parties for comment as part of a compliance showing prior to the initiation of service. The only issue then is not whether NGSO licensees should be required to demonstrate compliance with the operational and additional operational limits in advance of operations, but how far in advance. Ninety days simply is not enough.

Accordingly, PanAmSat proposes that NGSO applicants be required to demonstrate compliance with the additional operational limits prior to licensing, and with the operational limits within 90 days following the launch of the first NGSO satellite in their constellations. Within the latter time frame, the NGSO licensee should

² SkyBridge Petition at 36-39.

have measurement of the actual spacecraft antenna performance and the actual measured data needed to show compliance with the operational limits.

II. The Commission Should Require That NGSO FSS Operators Demonstrate Compliance With Aggregate EPFD_{down} limits.

For the reasons detailed in PanAmSat's petition for reconsideration, the aggregate EPFD_{down} limits provide GSO FSS systems with critical protection against NGSO FSS interference and should be vigorously enforced. Thus, the Commission should reject the suggestions of SkyBridge that it would be inordinately difficult to implement and enforce these aggregate EPFD_{down}. To the contrary, aggregate EPFD_{down} limits should be enforced using methodologies for which there already is a broad consensus. In particular, the Commission should require applicants to use the methodologies described in the Chairman's Report to the September 2000 ITU Study Group 4A (Document 4A/Temp/44) to demonstrate, prior to licensing, that they satisfy aggregate limits.

Three methods are defined in ITU-R WP-4A/Temp/44. "Method 1" uses validation EPFD curves, provided by the applicants as set forth in Section 25.146 of the Commission's rules. Convolution of these validation EPFD curves provides a worst case estimate of aggregate interference. The procedure is simple to implement and it requires no additional NGSO information.

Since this method does not use common test locations for the generation of the validation EPFD curves for each NGSO system, it can only be used to provide a preliminary check for the aggregate limits. Nonetheless, if the result produced by this first method satisfies the aggregate EPFD limits, then the implementation of the NGSO system in question will not exceed the aggregate limits.

If, on the other hand, Method 1 does not produce curves that satisfy the aggregate EPFD limits, then the more accurate "Method 2" should be used. This procedure also uses validation EPFD curves provided by the applicant. However,

Method 2 requires that the validation EPFD curves be generated for the same set of earth station test points for each system. Since the same test points are used for each NGSO system, this method is more representative than Method 1 of the actual aggregate levels that will be received.

If Method 2 produces curves in excess of the aggregate EPFD limits, “Method 3” should be used. Method 3 is a simultaneous simulation of multiple NGSO systems. It is the most realistic methodology to determine the aggregate EPFD interference level into GSO FSS earth stations. Hence, it requires coordination between the NGSO applicants in order to demonstrate through simultaneous simulation of NGSO systems that aggregate limits will be met.

NGSO systems should be licensed only if they can demonstrate that aggregate limits will not be exceeded using one of the three methods described in ITU-R WP-4A/Temp/44. These methodologies are fair; can be applied by NGSO applicants using well-defined standards; and provide a needed measure of protection for GSO FSS operators and their customers. SkyBridge’s resistance to such an approach is groundless and should be rejected.

III. The ITU-BR Software Should Be Used On Test Points Submitted By Potentially Affected GSO FSS Operators.

As SkyBridge observes in its petition, there is no clear definition for the “worst three test points” in terms of EPFD statistics, which are represented by curves specifying maximum power levels for any given percentage of time. In fact the ITU-R Recommendation BO.1503 only identifies a single worst case point. This point represents the maximum EPFD produced on the earth.

Although it is important to know the maximum EPFD point for synchronization loss reasons, the EPFD curve specified at this point may represent less degradation than EPFD curves at other locations. Moreover, NGSO systems are required to comply with EPFD validation limits for the entire

curve. Choosing one point along this curve provides no confidence to the GSO operators that their systems will be protected. Thus, GSO operators should be allowed to submit additional test points for consideration. Indeed, a preliminary draft new Recommendation approved at the last ITU-R WP 4A meeting in September 2000 (ITU-R WP4A/TEMP/18 (Rev.1)) would allow GSO operators to select test points for critical locations that may receive severe interference. Additionally, the map developed would provide guidance in the design of future GSO systems.

The preliminary draft new Recommendation also provides a method for NGSO operators to develop a world-wide map of peak EPFD levels along the earth. This maximum EPFD map would assist NGSO applicants to identify those areas on the surface of the earth where their NGSO system may exceed the validation EPFD limits. Hence, the Commission should also require NGSO applicants to submit maps of peak EPFD levels along the earth for each NGSO system by using the method specified in preliminary draft new Recommendation ITU-R WP4A/TEMP/18 (Rev.1).

IV. The Adoption Of WRC-2000 Earth Station Off-Axis EIRP Limits Is Unnecessary And Would Be Disruptive To Operating GSO Systems.

The Commission correctly determined that the off-axis EIRP limits that presently appear in Part 25 are more restrictive of GSO FSS earth stations than the limits adopted at WRC-2000. Whatever the value of those limits elsewhere, therefore, they are unnecessary in this country. Revising the limits that apply to U.S.-licensed earth stations, moreover, would generate regulatory confusion unnecessarily, to the detriment of GSO and NGSO systems alike.

CONCLUSION

For the reasons set forth herein, the Commission should deny the petition for reconsideration filed by SkyBridge in this proceeding.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Opposition to Petition for Reconsideration was sent by first-class mail, postage prepaid, this 24th day of April, 2001, to each of the following:

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