

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

In the Matter of

**Amendment of Parts 2 and 25 of the
Commission's Rules to Permit Operation of
NGSO FSS Systems Co-Frequency with GSO
and Terrestrial Systems in the Ku-Band**

ET Docket No. 98-206

COMMENTS OF THE BOEING COMPANY

The Boeing Company ("Boeing"), by its attorneys and pursuant to Section 1.415 of the Commission's Rules, 47 C.F.R. § 1.415, hereby submits the following comments in response to the above-captioned proceeding.

**I. THE COMMISSION SHOULD ADOPT IN ITS RULES THE KU-BAND
GSO/NGSO COMPROMISE AGREEMENT INCLUDED IN THE CPM REPORT**

Boeing urges the Commission to adopt into its rules the compromise agreement that was reached at the November 1999 Conference Preparatory Meeting ("CPM") in Geneva, Switzerland, and which was included in the text of the final CPM Report. The adoption of the compromise agreement would advance the Commission's objective of bringing new, advanced non-geostationary ("NGSO") fixed-satellite services ("FSS") to the public, while at the same time protecting incumbent Ku-band users from harmful interference. In addition, the adoption of the CPM compromise agreement would further the development of universally-available broadband telecommunications services by creating a consistent international regulatory environment for the launch of global NGSO FSS systems.

The Commission has acknowledged its desire to promote competition and innovation by allowing NGSO FSS systems to bring new advanced services to the public.¹ The Boeing NGSO FSS system is designed to provide such services, including “bandwidth on demand” broadband communication and data services that are currently not readily available to the public.² Moreover, Boeing’s use of medium-earth orbit (“MEO”) NGSO architecture allows it to provide these services on a truly universal basis to users all over the world.³ Because of the benefits that NGSO FSS systems could bring to the public, the Commission has expressed its desire to license such systems as long as the needs of incumbent services in the Ku-band are considered.⁴

The compromise agreement reached at the CPM meets this Commission objective. The CPM concluded—with the concurrence of the United States and after years of intense study—that the interference limits included in the compromise package provide adequate protection to incumbent fixed service and geostationary (“GSO”) satellite systems, while enabling the launch of NGSO FSS systems. Since the 1997 World Radiocommunication Conference (“WRC-97”), a major effort has been underway by the ITU-R and the international satellite and radiocommunications community to develop criteria for the operation of NGSO FSS systems in the Ku-band on a shared basis with other users. Numerous international working groups and committees have provided technical expertise and input on this issue, and have engaged in years

¹ See *Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-band Frequency Range and Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates*, Notice of Proposed Rule Making, FCC 98-310, at ¶ 9 (Nov. 24, 1998) (“Ku-band NPRM”).

² See *Application for Authority to Launch and Operate a Non-Geostationary Medium Earth Orbit Satellite System in the Fixed Satellite Service*, File No. SAT-LOA-19990108-00006, at 3 (Jan. 8, 1999) (“Boeing Ku-band Application”). These services can include basic voice telephony, facsimile transmission, video-conferencing, high-speed data transfer for local area networks, Internet access, data broadcasts and other services. See *id.* at 3-4.

³ See *id.* at 2.

⁴ See *Ku-band NPRM* at ¶ 9.

of deliberation.⁵ These deliberations have been largely free from excessive influence by any single special interest. Although NGSO FSS proponents have been well represented, proponents have been outnumbered consistently by representatives of incumbent spectrum users, such as GSO FSS and BSS operators.⁶ Thus, the carefully-balanced compromise reached at the CPM after years of deliberations will adequately protect the incumbents and should be adopted.

Additionally, the adoption of the CPM agreement will have the benefit of fostering the development of universally-available telecommunications services by creating globally-consistent regulatory requirements. Such consistency will aid the implementation of global NGSO FSS systems, which will need to operate under the regulatory auspices of numerous countries. The deviation of national licensing regulation by individual states would cause delay and increased expense for NGSO FSS operators, which will ultimately inure to the detriment of the worldwide public. Therefore, Boeing urges the Commission to adopt the compromise agreement reached at the CPM without deviation.

⁵ These committees include Joint Task Group 4-9-11 (“JTG 4-9-11”), Working Party 4A (“WP 4A”), Joint Working Party 4-9S (JWP 4-9S”) and Joint Working Party 10-11S (“JWP 10-11S”).

⁶ BSS, or Broadcast Satellite Service, is the international designation for direct-to-home satellite broadcast service using high-power and small diameter dishes. In the United States, it is known as DBS, or Direct Broadcast Satellite, service.

II. THE COMMISSION SHOULD RESIST EFFORTS TO IMPOSE UNNECESSARY OR EXCESSIVE REGULATORY MEASURES THAT HARM NGSO FSS SYSTEMS BUT DO NOT PROVIDE ADDITIONAL PROTECTION TO GSO FSS AND BSS SYSTEMS

As expressly acknowledged in the CPM Report, a few additional regulatory measures will be needed that are not included in the text of the CPM report. In developing these additional measures, the Commission should conform to the framework of the compromise agreement and should not impose new, excessive burdens that hinder the provision of NGSO FSS services to the public. For example, one commenter has proposed additional regulatory measures that are either unnecessary or excessive for the protection of incumbent Ku-band users.⁷ The Commission should resist efforts to adopt such unnecessary regulatory measures, which are potentially harmful to the development of NGSO FSS systems, while providing no significant additional protection to GSO FSS and BSS systems.

Certain of the proposed regulatory measures are clearly inappropriate. It has been suggested that the Commission require the development of software to be used by NGSO FSS licensees to determine whether the combined interference of their system and previously launched NGSO FSS systems would exceed the aggregate mask limitations.⁸ Such software is patently unnecessary to determine compliance with aggregate mask limitations, at least for the first three NGSO FSS systems launched using all the available Ku-band bandwidth. If each of the first three NGSO FSS systems can demonstrate compliance with the single entry mask limits for its own system, then the combined interference of all three systems cannot exceed the aggregate mask limitation. This is because the single mask entry limits were determined by dividing the aggregate mask limit by the number of NGSO FSS systems that are expected to be

⁷ See Letter from Kalpak Gude, Vice President and Associate General Counsel, PanAmSat, to Donald Abelson, Chief, International Bureau, FCC (Dec. 6, 1999) (Annex).

implemented (which was estimated at 3.5 systems). Therefore, the single entry mask limit is nothing more than the aggregate limitation divided by 3.5. If the first three NGSO FSS licensees can demonstrate compliance with the single entry mask limitation for their own systems, each of the systems will, by definition, meet the aggregate mask limitation for the first three NGSO FSS systems launched. The development of additional software serves no purpose, except in the case of the fourth and subsequent NGSO FSS systems.

In addition, it has been argued that NGSO FSS licensees should be required to verify compliance with the operational limits included in the CPM Report prior to the construction of their systems.⁹ Such a proposal would apparently require NGSO FSS applicants to provide documentation demonstrating that they meet the operational masks for both temporal and geographical distributions as part of the license application process well prior to operations.¹⁰ The proposal also apparently envisions documentation by means of computer software provided by the NGSO FSS applicant.¹¹

Even though Boeing could provide prior verification that its system meets operational limits using the worst-case scenario of the Radiocommunications Bureau software, it is completely unnecessary and unwarranted to seek advance verification of the operational limits prior to the operation of the NGSO FSS system. First, advanced verification of operational limits risks a long and contentious process between spectrum users. Disagreements are bound to arise over the parameters of the software and standards to be used to determine compliance.

⁸ *See id.*

⁹ *See id.*

¹⁰ *See id.*

¹¹ *See id.*

Second, “operational” limits are by definition meant to apply to systems in operation. The purpose of the operational limits is to prevent actual harmful interference to GSO systems. Although such circumstances are extremely unlikely to occur, appropriate remedies already exist within the framework of FCC rules and ITU processes. In such improbable circumstances, an NGSO FSS operator would be required to take appropriate action to eliminate the harmful interference, such as limiting the power from a particular spot beam by switching some of the traffic load to different satellites, or switching the frequency used on a particular beam to a different band that does not overlap with that used by the GSO ground station. With such existing remedies, verification of operational limits prior to operation (with the requisite development and approval of software) only serves to delay and hinder the implementation of NGSO FSS systems unnecessarily.

Other proposed regulatory measures would equally hinder the development of NGSO FSS systems without providing any additional interference protection for the users of GSO FSS and BSS networks. One measure proposes the creation of operational limit map software that would demonstrate a geographic distribution of the maximum EPFD_{down} levels within the United States.¹² Any given location on the map would have to show the maximum EPFD_{down} level that can occur at that location, with a minimum resolution of 1° longitude by 1° latitude.¹³ The alleged purpose of the map would be to demonstrate that the EPFD_{down} levels are all below the 100% operational limit values.¹⁴

¹² *See id.*

¹³ *See id.*

¹⁴ *See id.*

Such a measure is unnecessarily and unduly burdensome on NGSO FSS systems and would provide no additional protection for GSO networks or their users. Because NGSO FSS systems are already required to operate within verification and operational limits, the additional mapping requirement would only serve to show how far below the limits a system is operating. If a NGSO FSS system is operating within the verification and operational limits, there will be by definition and implementation no unacceptable interference to a GSO network and no need to demonstrate compliance with the operational limit values using software that needs to be developed and approved. Conversely, if the NGSO FSS system exceeds the operational limit values and unacceptable interference occurs, the GSO system operator will be aware of the unacceptable interference without the need of mapping software.

Finally, there is no need for the proposal that NGSO FSS applicants publish the exact location of their satellite orbital elements on a regular basis for the convenience of GSO system operators.¹⁵ Both the Air Force and NASA already provide a database of all orbiting space objects that is available to the public. Should a GSO network operator suspect that an earth station terminal is receiving unacceptably high levels of interference from a NGSO FSS satellite, it is already able to check existing databases to determine the locations of all NGSO satellites. Accordingly, no additional reporting requirements need to be leveled on NGSO FSS operators to meet GSO network concerns.

The global satellite communications industry has invested tremendous effort to develop a compromise package of verification, operational and additional operational limits that enable the launch of NGSO FSS systems, while adequately protecting existing spectrum users. Certain regulatory measures must still be developed to fully implement the compromise limits. The

¹⁵ *See id.*

development of these additional regulatory measures constitutes a relatively simple task, however, and the Commission should not permit their misuse to upset the carefully balanced compromise developed by the CPM.

Instead, the Commission should promote the development of NGSO FSS networks by adopting in its rules the compromise limits included in the CPM Report. The Commission should also assist in the development of those additional rational regulatory measures that are acknowledged in the CPM Report, while rejecting proposals for unnecessary and burdensome regulatory provisions that will provide no legitimate additional protection for existing spectrum users in the Ku-band.

Respectfully submitted,
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