March 18, 1999

Mr. Roderick K. Porter
Acting Chief of the International Bureau
Federal Communications Commission
Washington, D.C. 20554

Dear Mr. Porter:

The National Telecommunications and Information Administration (NTIA) on behalf of the Executive Branch Agencies, has approved the release of two documents, a revised preliminary view and a proposal that are both concerned with WRC-2000 agenda item1.13.

The preliminary view outlines the proposed United States position concerning the provisional limits adopted in Article **S22** and those contained in WRC-97 Resolutions **130** and **538**, and the limits in Article **S21** and WRC-97 Resolution **131** with the intent of protecting the GSO FSS, GSO BSS, space sciences, and terrestrial services while allowing the introduction of NGSO FSS systems. The revisions provided by NTIA specifically deal with aspects of particular concerns to the government, protection of large earth stations, terrestrial radiolocation, and space science services.

This proposal for agenda item 1.13 would require coordination between NGSO FSS transmitting space stations and GSO receive earth stations with antenna gains greater than a specified value. It also limits the use of FSS in the 17.3-17.8 Ghz band in Region 2 to GSO systems. Also included are additions and or modifications to Articles **S5**, **S9**, **S22,** Appendices **S4, S5** and a proposals to require coordination between NGSO FSS transmitting space stations and GSO receive earth stations with antenna gains greater than a specified value.

Sincerely,

Original Signed by Fred Wentland for
William T. Hatch
Acting Associate Administrator
Office of Spectrum Management

Enclosures

RCS 00-270/1WAC/075

United States Preliminary View for Agenda Item 1.13

WRC-2000 Agenda Item 1.13: *on the basis of results of the studies in accordance with Resolutions **130(WRC-97), 131(WRC-97), and 538(WRC-97)**;*

> **1.13.1:** *to review and, if appropriate, revise the power limits appearing in Articles **S21** and **S22** in relation to the sharing conditions among non-GSO FSS, GSO FSS, GSO broadcasting-satellite service (BSS), space sciences and terrestrial services, to ensure the feasibility of these power limits and that these limits do not impose undue constraints on the development of these systems and services;*
>
> **1.13.2:** *to consider the inclusion in other frequency bands of similar limits in Articles **S21** and **S22**, or other regulatory approaches to be applied in relation to sharing situations;*

ISSUE: Regulatory and technical provisions to enable sharing among non-GSO FSS, GSO FSS, GSO BSS, space sciences and terrestrial services.

BACKGROUND: WRC-97 adopted provisional power flux density limits in certain frequency bands which would apply to non-GSO FSS systems to protect GSO FSS networks, and GSO BSS networks. Resolution **130 (WRC-97)**, *Use of Non-Geostationary Systems in the Fixed-Satellite Service in Certain Frequency Bands* and Article **S22.2** of the Radio Regulations contain provisional limits corresponding to an interference level caused by one NGSO system in the frequency bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz. Resolution **538**, *Use of the Frequency Bands Covered by Appendices **30** and **30A** by Non-GSO Systems in the Fixed-Satellite Service*, and Article **S22** contain limits corresponding to permissible levels of interference from a NGSO system into a GSO BSS network. Resolution **131 (WRC-97)**, *Power Flux-Density Limits Applicable to Non-GSO FSS Systems for Protection of Terrestrial Services in the Bands 10.7-12.75 GHz and 17.7-19.3 GHz*, and Article **S21** contain limits to protect terrestrial services. Resolution **131** requests review of the provisional limits and calls for further study of current pfd limits.

PRELIMINARY VIEW:

1. The U.S. continues to review the power limits; both the provisional limits adopted in Article **S22** and those contained in WRC-97 Resolutions **130** and **538**, and the limits in Article **S21** and WRC-97 Resolution **131** with the intent of protecting the GSO FSS, GSO BSS, space sciences, and terrestrial services while allowing the introduction of NGSO FSS systems.

2. The APFD definition in the Radio Regulations should be modified to take into account the normalized directivity of the GSO satellite antenna. (For ease of computation, the WRC-97 APFD definition did not take into account the GSO satellite antenna pattern.) The corresponding APFD limits would consist of different values for the different frequency bands. Due to the differing spacecraft design practices in Ku and Ka bands, the satellite reference antenna patterns should also vary with frequency band.

3. GSO systems operating in slightly inclined orbits constitute an important subgroup of all operational satellites and need to be protected from NGSO interference.

4. Outside of those bands where provisional power limits were adopted by WRC-97, no technical basis has been established for consideration by WRC-2000 of the power limits approach to sharing between and or among NGSO FSS systems and GSO FSS, GSO BSS, space sciences, and or terrestrial services systems. Therefore, the U.S. opposes general application or power limits outside those bands where provisional power limits were adopted at WRC-97.

5. Sharing with satellite systems in "quasi-geostationary satellite orbit" needs to be considered within this agenda item.

Further views are given below grouped by issue.

NGSO/GSO

6. There will be a need for an alternative approach to facilitate sharing in some specific situations. Transmissions to earth stations with large antennas need to be protected from NGSO interference. The provisional epfd limits and associated time allowances do not adequately protect existing GSO FSS networks with large earth station antennas (large earth station antennas will be defined as a result of technical work within the ITU-R. EPFD limits and associated percentages of time that would provide sufficient protection to GSO networks having large earth station antennas would be substantially more stringent than limits that would protect other sensitive links. It is therefore desirable that GSO networks having large earth station antennas be treated separately from other sensitive links in order to avoid imposing undue constraints on the development of NGSO systems while protecting these GSO networks. The U.S. favors coordination between NGSO FSS networks and these GSO FSS networks. Regulatory procedures to allow an administration to identify the need for coordination and initiate the applicable coordination process are needed and may include additions or modifications to Articles **S5**, **S9**, **S22** and Appendices **S4** and **S5**. Thresholds based on GSO earth station antenna gain and protection criteria might be used in determining a need to coordinate.

NGSO/BSS

7. The study of the provisional power flux-density limits by the ITU-R and the review of these limits by WRC-2000 must ensure protection of modifications to the BSS Plans, including currently pending modifications and future modifications to the Plans.

8. The majority of BSS systems that have been implemented, or will be implemented in the future, are modifications to the Plans. In addition, more than three years can lapse between the submission of Annex 2 information regarding proposed modifications to the Plans by an administration, and the actual publication of this information by the BR. This can result in substantial delays in completion of the modification process, even for modifications of existing frequency assignments. WRC-97 (in both Resolution **538** and Resolution **721**, agenda item 1.13) clearly foresaw the need to protect future modifications to the plans from NGSO FSS systems, and to ensure that these limits do not impose undue constraints on the development of these systems and services (as stated in agenda item 1.13).

NGSO/Terrestrial Services

9. Characteristics of radars currently operating in the bands 13.75-14.0 GHz have been examined. Radars operating in the 13.75-14.0 GHz band employ e.i.r.p. values of up to 79 dBW. Interference from these radiolocation stations to NGSO FSS networks would appear to be probable and sharing may not be feasible. Footnotes **S5.502**, **S5.503**, and **S5.503A** were adopted at WRC-92 and WRC-95 to facilitate sharing between radiolocation, radionavigation, space research, and fixed-satellite services in this band. Footnote **S5.502** states that the eirp radiated by a station in the radiolocation or radionavigation services toward the geostationary orbit may not exceed 59 dBW and that earth stations in the fixed-satellite service must have an eirp at least 68 dBW and a minimum antenna diameter of 4.5 meters, and the eirp should not exceed 85 dBW,. These restrictions are necessary for the protection of FSS carriers from radar interference and also minimize the possibility of unacceptable interference to the space research, radiolocation and radionavigation services. This delicate balance must be maintained in order to avoid unacceptable constraints on or interference to the services involved; therefore the U.S. opposes any change to footnotes **S5.502** and **S5.503**.

10. Characteristics of radars currently operating in the band 17.3-17.7 GHz have been examined. Space tracking radars operating in the band 17.3-17.7 GHz employ e.i.r.p. values up to 116 dBW directed at a satellite over extended periods of time. Sharing was found to be feasible with GSO FSS systems (Earth-to-space) if the radiolocation stations limit their emissions toward the geostationary orbit. Radiolocation station emissions toward a NGSO satellite could be 66 dB higher than toward the geostationary orbit. Sharing is not feasible between radiolocation stations and NGSO FSS networks. The U.S. opposes the introduction of NGSO FSS systems in this band in Region 2 (there is currently no allocation for the use of the band 17.3-17.8 GHz systems in Region 2).

NGSO/Space Science Services

11. Earth stations operating in the 13.75-14.0 GHz band are technically constrained by **S5.502** (minimum size of 4.5 meters; e.i.r.p. at least 68 dBW and should not exceed 85 dBW), **S5.503** (e.i.r.p. density in the band 13.772-13.778 MHz), and **S5.503A** (FSS shall not cause harmful interference to radiolocation stations installed on NGSO space stations in the space research and Earth exploration-satellite services until January 1, 2000). In addition, there are ITU-R Recommendations (e.g., ITU-R S.1068 (Fixed-satellite service and radiolocation/radionavigation services sharing in the band 13.75-14.0 GHz) and ITU-R SA.1071 (Use of the 13.75 to 14.0 GHz band by the space science services and the fixed-satellite service)) that describe sharing situations with the fixed-satellite service, including recommended limitations on the FSS. These footnotes and recommendations will have to continue to be applied to both GSO and NGSO systems operating in the band. **(18March99)**

Proposal for Agenda Item 1.13

on the basis of results of the studies in accordance with Resolutions 130(WRC-97), 131(WRC-97), and **538(WRC-97)**;

1.13.1: *to review and, if appropriate, revise the power limits appearing in Articles **S21** and **S22** in relation to the sharing conditions among non-GSO FSS, GSO FSS, GSO broadcasting-satellite service (BSS), space sciences and terrestrial services, to ensure the feasibility of these power limits and that these limits do not impose undue constraints on the development of these systems and services;*

1.13.2: *to consider the inclusion in other frequency bands of similar limits in Articles **S21** and **S22**, or other regulatory approaches to be applied in relation to sharing situations;*

Background Information: WRC-97 adopted provisional power flux density limits in certain frequency bands which would apply to non-GSO FSS systems to protect GSO FSS networks, and GSO BSS networks. Resolution **130 (WRC-97)**, *Use of Non-Geostationary Systems in the Fixed-Satellite Service in Certain Frequency Bands* and Article **S22.2** of the Radio Regulations contain provisional limits corresponding to an interference level caused by one NGSO system in the frequency bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz. Resolution **538,** *Use of the Frequency Bands Covered by Appendices **30** and **30A** by Non-GSO Systems in the Fixed-Satellite Service*, and Article **S22** contain limits corresponding to permissible levels of interference level from a NGSO system into a GSO BSS network. Resolution **131 (WRC-97),** *Power Flux-Density Limits Applicable to Non-GSO FSS Systems for Protection of Terrestrial Services in the Bands 10.7-12.75 GHz and 17.7-19.3 GHz*, and Article **S21** contain limits to protect terrestrial services. Resolution **131** requests review of the non-provisional limits and calls for further study of non-provisional pfd limits.

Proposals:

1: Proposals to require coordination between NGSO FSS transmitting space stations and GSO receive earth stations with antenna gains greater than a specified value. These proposals include additions and/or modifications to Articles **S5**, **S9**, S22 and Appendices **S4** and **S5**.

USA/1.13/01
MOD

S5.441 The use of the bands 4 500-4 800 MHz (space-to-Earth), 6725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **S30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth), and 12.75-13.25 GHz (Earth-to-space) by non-geostationary-satellite systems in the fixed-satellite service ~~shall be in accordance with~~ is subject to the provisions of ~~Resolution **130 (WRC-97)**~~ **Article S22** and No. **S9.12.** The use of the bands 10.7-10.95 GHz (space-to-Earth) and 11.2-11.45 GHz (space-to-Earth) is subject to the provisions of No. **S9.16A** and **S9.16B.**

USA/1.13/02
MOD

S5.484A The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by non-geostationary- and geostationary-satellite systems in the fixed-satellite service is subject to the provisions of ~~Resolution **130 (WRC-97)**~~ Article S22 and No. **S9.12.** The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 17.8-18.6 GHz (space-to-Earth), and 19.7-20.2 GHz (space-to-Earth) is subject to the provisions of No. **S9.16A** and **S9.16B.** ~~The use of the band 17.8-18.1 GHz (space-to-Earth) by non-geostationary fixed-satellite service systems is also subject to the provisions of Resolution **538 (WRC-97)**~~.

Reasons: The references to Resolutions **130 (WRC-97)** and **538 (WRC-97)** were replaced by a reference to Article **S22** where the non-transitional provisions of these resolutions are contained. The Article **S9** provisions for stations for which the requirement to coordinate is included in a footnote to the Table of Frequency Allocations were specified in order to clarify the requirements for coordination under the existing No. **S9.12.** The proposed **S9.16A** and **S9.16B** would require coordination between NGSO FSS transmit satellites and GSO FSS receive earth stations with large antennas. GSO FSS earth stations with large antennas are not adequately protected by the EPFD levels contained in Table **S22-3** and case-by-case coordination of systems operating co-frequency, co-directional links in the space-to-Earth direction is required.

ARTICLE S9

Sub-Section IIA - Requirement and request for coordination

USA/1.13/03
MOD

S9.16A vi) which is a specific earth station within a geostationary-satellite network in the fixed-satellite service in certain frequency bands subject to **S5.441** or **S5.484A,** in respect of a non-geostationary satellite system in the fixed-satellite service;

Reasons: GSO FSS earth stations with large antennas are not adequately protected by the EPFD levels contained in **Table S22-3** and case-by-case coordination is required. Since coordination between a NGSO FSS space station and large GSO FSS earth stations is a new type of coordination that does not currently exist in Article **S9**, it is necessary to add two new entry points in Article **S9:**

- One entry point to enable the NGSO space station administration to request coordination with

administrations having specific large earth station antennas

- Another entry point to enable the reciprocal coordination to take place, i.e. the possibility for an administration planning to implement a specific large GSO earth station to request coordination with administrations having NGSO FSS transmit space stations.

USA/1.13/04

MOD

S9.16Bvii) which is a non-geostationary-satellite system in the fixed-satellite service in certain frequency bands subject to **S5.441** or **S5.484A,** in respect of a specific earth station within a geostationary satellite network in the fixed-satellite service;

Reasons: Same as the reasons for **S9.16A**

TABLE **S22-3**ZZ

PART A

TABLE **S22-3**ZZ

PART B

USA/1.13/05

MOD

ZZ -For certain receive earth stations, this Table is not applicable and coordination is required under **S9.16A** and **S9.16B**.

Reasons: The EPFD levels contained in **Table S22-3** do not adequately protect earth stations in geostationary satellite networks in the fixed-satellite service with large antenna gains. Case-by-case coordination is required by the proposed modifications to footnotes **S5.441** and **S5.484A**.

Since there is no requirement to give the specific locations of earth stations today, there may need to be a resolution written to have typical earth stations, already in coordination or notified, that meet the above criteria to be brought in as specific earth stations. In this resolution, there will have to be some guidance on priorities. Additional guidance will need to be added to the *Instructions for Filling Out the Form of Notice ApS4/II and ApS4/III Relating to Space Radiocommunication Stations* distributed by CR/65.

MOD TO APPENDIX S4

ANNEX 2B (TO APPENDIX **S4**)

Table of characteristics to be submitted for space and radio astronomy services

A. General characteristics of the satellite network or the earth station

(Only these two columns are reproduced. These changes need to be incorporated into the full table.)

USA/1.13/06

MOD

	Items in Appendix	Notification or co-ordination of a GSO network (including Appendix **S30B**)
A.1.a	X	
A.1.b		
A.1.c		
A.1.d		
A.1.e.1		
A.1.e.2		
A.1.e.3	$\underline{C}^{ZZ}$	
A.1.e.4		
A.1.f	X	
A.2.a	X	
A.2.b	X	
A.2.c		
A.3	X	
A.4.a.1	X	
A.4.a.2	X	
A.4.a.3	X	
A.4.a.4	X	
A.4.a.5	X	
A.4.b		
A.4.c		
A.5	X	
A.6	X	
A.7.a	$\underline{C}^{ZZ}$	
A.7.b	$\underline{C}^{ZZ}$	
A.7.c	$\underline{C}^{ZZ}$	
A.7.d	$\underline{C}^{ZZ}$	
A.8		
A.9		
A.10		
A.11		
A.12		
A.13	X	

X Mandatory information

O Optional information

C This information need only be furnished when it has been used as a basis to effect coordination with another administration

ZZ) Required for coordination under No. **S9.16A** or **S9.16B**.

B. Characteristics to be provided for each satellite antenna beam and for each earth station antenna

Items in Appendix	Notification or coordination of a GSO network (including Appendix **S30B**)
B.1	X
B.2	X
B.3.a	X
B.3.b.1	X
B.3.b.2	X
B.3.c	C
B.3.d	X
B.3.e	X
B.3.f	X
B.3.g.1	
B.3.g.2	
B.3.g.3	
B.3.g.4	
B.3.g.5	
B.3.g.6	
B.3.g.7	
B.4.a	
B.4.b	
B.5.a	C[ZZ]
B.5.b	C[ZZ]
B.5.c	C[ZZ]
B.6	

X Mandatory information

O Optional information

C This information need only be furnished when it has been used as a basis to effect coordination with another administration

ZZ) Required for coordination under No. **S9.16A** or **S9.16B**.

Reasons: This is consequential to proposed modifications to footnotes **S5.441** and **S5.484A**. Administrations will need to submit specific earth station information for earth stations associated with

geostationary-satellite networks in the fixed-satellite service with maximum antenna gains as specified in the proposed addition to Appendix **S5**.

USA/1.13/07

ADD

APPENDIX S5

TABLE S5-1 (*CONTINUED*)

Reference of Article S9	**Case**	**Frequency bands (and Region) of the service for which coordination is sought**	**Threshold/condition**	**Calculation method**	**Remarks**
No. **S9.16A** GSO earth station/ NGSO system	A specific earth station in a geostationary satellite network in the fixed-satellite service in respect of a non-geostationary-satellite system in the fixed-satellite service.	The following frequency bands subject to S**5.441** or **S5.484A:** 10.7-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 17.8-18.6 GHz (space-to-Earth), and 19.7-20.2 GHz (space-to-Earth)	Conditions: i)the frequency bands overlap and ii) the satellite network using the geostationary-satellite orbit has specific receive earth stations with an antenna gain greater than or equal to 64 dBi for the frequency bands 10.7-12.75 GHz or 68 dBi for the frequency bands 17.8-18.6 GHz and 19.7-20.2 GHz	i) compare frequency bands and ii) use the maximum antenna gain of the specific receive earth station in the geostationary-satellite network as given in Appendix **S4** data	The thresholds/ conditions for coordination do not apply to typical receive earth stations operating in satellite networks using the geostationary-satellite orbit.

No. **S9.16B** NGSO system/ GSO earth station/	A non-geostationary-satellite system in the fixed-satellite service in respect of a specific earth station in a geostationary satellite network in the fixed satellite service.	The following frequency bands subject to S**5.441** or **S5.484A:** 10.7-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 17.8-18.6 GHz (space-to-Earth), and 19.7-20.2 GHz (space-to-Earth)	Conditions: i)the frequency bands overlap and ii) the satellite network using the geostationary-satellite orbit has specific receive earth stations with an antenna gain greater than or equal to 64 dBi for the frequency bands 10.7-12.75 GHz or 68 dBi for the frequency bands 17.8-18.6 GHz and 19.7-20.2 GHz	i) compare frequency bands and ii) use the maximum antenna gain of the specific receive earth station in the geostationary-satellite network as given in Appendix S4 data	The threshold/ condition for coordination do not apply to typical receive earth stations operating in satellite networks using the geostationary-satellite orbit.

Reasons: This is consequential to proposed changes to footnotes **S5.441** and **S5.484A**. Earth stations with large antenna gains as defined in the condition/threshold column are not adequately protected by the EPFD levels contained in Table **S22-3** and case-by-case coordination is required.

2. Proposal to modify Articles **S5** and **S22** to clarify that there was no allocation to NGSO FSS (Earth-to-space) in the band 17.3-17.8 GHz in Region 2. Additionally, sharing studies done since WRC-97 indicate that the NGSO FSS is not compatible with the existing and allocated services.

USA/1.13/08

MOD

S5.516 The use of the band<u>s</u> 17.3-18.1 GHz by geostationary-satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. For the use of the band 17.3-17.8 GHz in Region 2 by feeder links for the broadcasting-satellite service in the band 12.2-12.7 GHz, see Article **S11**. The use of the bands 17.3-18.1 GHz (Earth-to-space) in Regions 1 and 3 and 17.8-18.1 GHz (Earth-to-space) in Region 2 by non-geostationary-satellite systems in the fixed-satellite service is subject to the provisions of Resolution **538 (WRC-97)**. <u>The use of the band 17.3-17.8 GHz in Region 2 by systems in the fixed-satellite service (Earth-to-space) is limited to geostationary-satellites.</u>

Reasons: Additional text to clarify the intent of the footnote. There is no allocation in the band 17.3-17.8 GHz in Region 2 for NGSO FSS (Earth-to-space). The possibility of an allocation was to be based on sharing studies between the NGSO FSS and the existing and planned services. Studies show that sharing between radiolocation stations and NGSO FSS networks is not feasible due to severe interference from operational radiolocation stations and these services are not compatible. In Region 2, the band 17-3-17.8 GHz is allocated to the BSS service beginning 1 April 2007. Studies show that transmit NGSO FSS earth stations are not compatible with receive BSS earth stations.

USA/1.13/09

MOD

ARTICLE S22

Space services

Section I - Cessation of emissions

TABLE **S22-1**

Frequency band allocated to the broadcasting-satellite service	Antenna diameter (cm)	Equivalent pfd level (dB(W/m^2/4kHz)) which may not be exceeded during the percentage of time shown		Reference antenna radiation pattern
		99.7%	100%	
11.7-12.5 GHz in Region 1, 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3	30 60 90	–172.3 –183.3 –186.8	–169.3 –170.3 –170.3	Recommendation ITU-R BO.1213
12.2-12.7 GHz in Region 2	45 100 120 180	–174.3 –186.3 –187.9 –191.4	–165.3 –170.3 –170.3 –170.3	§ 3.7.2 of Annex 5 of Appendix **S30**
~~17.3-17.8 GHz in Region 2~~	~~For further study [1)]~~			

~~[1)] The interference from non-geostationary fixed-satellite service (non-GSO FSS) systems into geostationary broadcasting-satellite service (GSO BSS) systems operating in the frequency bands 17.3-17.8 GHz relates to the two following sharing situations:~~

~~– non-GSO FSS transmit earth station into GSO receive earth station;~~

~~– GSO BSS transmit space station into non-GSO FSS receive space stations.~~

~~Both situations need to be studied, in particular since coexistence of receive BSS earth stations and large numbers of transmit non-GSO FSS terminals would not be feasible within the same country~~

Reasons: WRC-97 did not allow NGSO FSS (space-to-Earth) systems to operate in the band 17.3-17.8 GHz in Region 2. Equivalent pfd (EPFD) levels, as given in **Table S22-1**, are only applicable to NGSO space-to-Earth operations. In addition, there is no allocation in the band 17.3-17.8 GHz in Region 2 for NGSO FSS (Earth-to-space). The possibility of an allocation was to be based on sharing studies between the NGSO FSS and the existing and planned services. In Region 2, the band 17-3-17.8 GHz is allocated to the BSS service beginning 1 April 2007. Studies show that transmit NGSO FSS earth stations are not compatible with receive BSS earth stations. Thus, this modification to **Table S22-1** is also consequential to the proposed modification to footnote **S5.516.**

3. Proposal to NOC footnotes in Article S5 in the band 13.75-14.0 GHz to maintain the delicate sharing situation between the fixed-satellite, radiolocation, radionavigation, and space research/Earth exploration-satellite services.

USA/1.13/10

NOC

S5.502 In the band 13.75 - 14 GHz, the e.i.r.p. of any emission from an earth station in the fixed-satellite service shall be at least 68 dBW, and should not exceed 85 dBW, with a minimum antenna diameter of 4.5 metres. In addition the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services towards the geostationary-satellite orbit shall not exceed 59 dBW.

USA/1.13/11

NOC

S5.503 In the band 13.75 - 14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. The e.i.r.p. density of emissions from any earth station in the fixed-satellite service shall not exceed 71 dBW in any 6 MHz band in the frequency range 13.772 - 13.778 GHz until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band. Automatic power control may be used to increase the e.i.r.p. density above 71 dBW in any 6 MHz band in this frequency range to compensate for rain attenuation, to the extent that the power-flux density at the fixed-satellite service space station does not exceed the value resulting from use of an e.i.r.p. of 71 dBW in any 6 MHz band in clear sky conditions.

Reasons: To maintain the delicate sharing situation between the fixed-satellite, radiolocation, radionavigation, and space research/Earth exploration-satellite services, the requirements contained in the above footnotes cannot change. The restrictions specified in these footnotes are necessary for the protection of GSO FSS carriers from radar interference and also minimize the possibility of unacceptable interference to the radiolocation and radionavigation services. Studies show that there is a significant potential for unacceptable interference to NGSO FSS satellite receivers from radiolocation stations in the 13.75-14.0 GHz band.