Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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In the Matter of

Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use

IB Docket No. 98-172
RM-9005
RM-9118

To: The Commission

REPLY COMMENTS OF MOTOROLA, INC. AND IRIDIUM LLC

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SUMMARY

Motorola, Inc. ("Motorola"), jointly with Iridium LLC ("Iridium") as to issues regarding the 19.3-19.7 GHz and 29.25-29.5 GHz bands, hereby submits these Reply Comments in response to comments filed in the Commission's Notice of Proposed Rulemaking in IB Docket No. 98-172, which addresses, among other matters, blanket licensing in the 17.7-20.2 GHz and 27.5-30.0 GHz bands ("Ka-band").

First, commenters support or do not oppose blanket licensing for Non-Geostationary Orbit Fixed Satellite Service ("NGSO/FSS") systems in the Ka-band, including NGSO/FSS terminals in the 19.7-20.2 and 29.5-30.0 GHz bands. While several commenters suggest delaying such blanket licensing, Motorola believes that no delay is necessary. Following the work done at WRC-97 and in subsequent ITU-R Joint Task Group 4-9-11 meetings, it appears likely that EPFD and APFD limits will be adopted at WRC-00 that will assure an environment in which Geostationary Orbit Fixed Satellite Service ("GSO/FSS") and NGSO/FSS terminals can co-exist in certain portions of the Ka-band. The Commission may issue blanket licenses conditioned on compliance with appropriate industry-developed technical criteria once technical standards for GSO/FSS operation are established, including PFD and EIRP sharing limits and antenna off-axis limits.

Second, the majority of commenters, including Motorola, support most of the Commission's technical standards for GSO/FSS and NGSO/FSS terminals. Motorola also generally agrees with the Blanket Licensing Working Group Report concerning GSO/FSS sharing. Motorola can accept the PFD and EIRP values set forth in the Report, though as indicated in its Comments it favors the lowest figure possible, to limit intersystem interference

and hasten the implementation of Ka-band services to the public. Motorola also agrees with the coordination assumptions of the Report, which would require non-compliant, coordinated system operators to comply with the blanket licensing limits in the event a new orbital location operator is adversely affected by such non-compliant operation.

Motorola agrees with commenters favoring a 3 dB relaxation for elliptical and offset-fed antenna sidelobe performance outside the orbital arc. Motorola also supports parties who favor determination of a maximum EIRP adaptive fade allowance for compliance with Section 25.204 of the Rules, which requires that all Ka-band FSS earth stations employ adaptive uplink power control or other methods of fade compensation. Further, Motorola disagrees with several commenters who suggest that it is premature to adopt antenna pointing accuracy requirements. Motorola, joined by several commenters, believes that a dual pilot/identification application requirement represents the simplest and most readily implementable means to assure that ubiquitous installation of earth terminals does not result in mutual interference between GSO/FSS uplinks.

Third, Motorola and Iridium oppose proposals by several commenters to alter the current designations of the MSS/FL bands because they are contrary to the public interest, fail to provide any net benefits and would seriously harm current and future MSS operations.

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REPLY COMMENTS OF MOTOROLA, INC. AND IRIDIUM LLC

Motorola, Inc. ("Motorola"), licensee and applicant in the Fixed-Satellite Service ("FSS") in the Ka-band, and Iridium LLC ("Iridium"), applicant for a new Mobile Satellite Service ("MSS") system, the MACROCELL system, which proposes feeder link operation in the 19.3-19.7 GHz and 29.1-29.5 GHz bands, hereby submit these Reply Comments in response to comments filed on November 19, 1998 in the Commission's Notice of Proposed Rulemaking ("NPRM") in the above-captioned proceeding.[1] Motorola, as it stated in its Comments, supports blanket licensing in the Ka-band where Non-Geostationary Orbit Fixed Satellite Service

[1] 63 Fed. Reg. 54,100 (October 8, 1998). Iridium is a party to these Reply Comments only with regard to Section III herein and the specific references to Section III in the Conclusion, i.e., Section IV. Iridium takes no position on the other issues addressed in other sections herein.

("NGSO/FSS") systems are authorized, as well as the segmentation of FSS and Fixed Service ("FS") in those portions of the Ka-band where blanket licensing is proposed. Motorola also supports most of the Commission's technical standards for Geostationary Orbit Fixed Satellite Service ("GSO/FSS") and NGSO/FSS terminals. Motorola and Iridium support the Commission's decision not to alter the MSS feeder link bands.

I. COMMENTERS SUPPORT BLANKET LICENSING FOR NGSO/FSS SYSTEMS IN THE KA-BAND

The comments filed in response to the Commission's NPRM either support or do not oppose NGSO/FSS blanket licensing in the 19.7-20.2 and 29.5-30.0 GHz bands or in the 18.8-19.3 and 28.6-29.1 GHz bands. Some parties, however, raise questions concerning the appropriateness of proceeding immediately with NGSO/FSS blanket licensing in the GSO/FSS bands. As Motorola demonstrated in its Comments, and as the record of this proceeding confirms, there is no reason to delay NGSO/FSS blanket licensing in the GSO/FSS portion of the Ka-band.[2]

A. Motorola Supports NGSO/FSS Blanket Licensing in the 19.7-20.2 and 29.5-30.0 GHz Bands

In its Comments, Motorola noted that blanket licensing will permit the routine grant of large numbers of small earth stations for use with FSS systems, permitting those terminals to be sold and installed with the ease that cellular telephones are marketed and used

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[2] Motorola Comments at 3-5.

today.[3] Motorola urged the Commission to explicitly allow for blanket licensing for NGSO/FSS terminals in all portions of the Ka-band where small NGSO/FSS terminals are likely to operate, including the 19.7-20.2 and 29.5-30.0 GHz bands.[4]

Further, following the work done at WRC-97 and in subsequent ITU-R Joint Task Group 4-9-11 ("JTG 4-9-11") meetings, it appears likely that EPFD and APFD limits will be adopted for these bands at WRC-00.[5] The goal of these limits, as explained in Motorola's Comments, is to assure that NGSO/FSS systems can operate without causing unacceptable interference to GSO/FSS systems in the 19.7-20.2 and 29.5-30.0 GHz bands, as required by the Commission, and facilitate blanket licensing for all satellite users in these bands.[6] As long as an NGSO/FSS system's APFD and EPFD remain below the permissible limits, it will not cause unacceptable interference to GSO/FSS systems. Conversely, the blanket licensing parameters that will be developed, i.e., earth terminal off-axis EIRP levels, for GSO/FSS systems in these bands will define the limits of potential GSO/FSS interference into NGSO/FSS systems in the 19.7-20.2 and 29.5-30.0 GHz bands. Thus, implementation of APFD and EPFD limits in

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3 Motorola Comments at 4.

4 Id.

5 The EPFD, equivalent power flux-density, is defined as the sum of the power flux-densities produced at a point of the Earth's surface by all space stations within an NGSO system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing towards the GSO orbit. The APFD, aggregate power flux-density, is defined as the summation of the power flux-densities produced at a point in the GSO orbit by all the Earth stations of an NGSO/FSS system. In order to more accurately reflect the actual interference level seen by the GSO/FSS satellite, the APFD is to be revised by incorporating the satellite antenna pattern. See ITU-R Resolution 130, Annex 1; JTG 4-9-11/US61.

6 Motorola Comments at 5, n.12.

conjunction with GSO/FSS sharing criteria will clear the way for blanket licensing for all satellite users in this portion of the Ka-band.

B. Comments Favor NGSO/FSS Blanket Licensing in the 19.7-20.2 and 29.5-30.0 GHz Bands

The Spectrum and Orbit Utilization Section, Satellite Communications Division of the Telecommunications Industry Association ("TIA-SOUS") supports the Commission's proposal favoring blanket licensing in the GSO/FSS and NGSO/FSS portions of the Ka-band.[7] For its part, Boeing Company ("Boeing") recommends that, with regard to NGSO/FSS operations in the GSO/FSS part of the Ka-band, the Commission should not permit operators of primary services to emit unnecessary interference into secondary systems if it can be avoided and spectrum efficiency can be enhanced.[8] In this way, Boeing correctly asserts, the U.S. can lead global development of NGSO/FSS service, operating whether NGSO/FSS is authorized either on a primary or secondary basis.[9]

C. The Commission Need Not Delay Blanket Licensing in the 19.7-20.2 and 29.5-30.0 GHz Band

The Commission correctly stated that "we believe that it is in the public interest to provide for the most flexible and efficient use of spectrum resources possible."[10] The

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[7] TIA-SOUS Comments at 5. Indeed, TIA-SOUS suggests that the Commission authorize earth terminals for 10 years, independently of the associated satellite license. Id.

[8] Boeing Comments at 4.

[9] Id.

[10] NPRM at ¶55; Motorola Comments at 8.

development of APFD and EPFD limits in the 19.7-20.2 GHz and 29.5-30.0 GHz bands will further their objectives by allowing for the co-existence of ubiquitous GSO/FSS and NGSO/FSS terminals in these bands.[11]

Lockheed Martin Corporation ("Lockheed") supports the Commission's proposal to implement blanket licensing in the GSO/FSS bands, but suggests that insufficient information exists to propose specific blanket licensing criteria for NGSO/FSS systems. While it is not clear whether this suggestion is intended to apply to NGSO/FSS blanket licensing in the GSO/FSS bands as well as to NGSO/FSS blanket licensing in the 18.8-19.3 and 28.6-29.1 GHz bands, Lockheed does say that technical issues for NGSO/FSS systems should be resolved by an industry advisory group. The work of just such an assembly of industry (and government) representatives, i.e., the JTG 4-9-11, is currently underway to establish EPFD and APFD limits for sharing with GSO/FSS systems in the 19.7-20.2 and 29.5-30.0 GHz bands.[12] Specific uplink criteria for NGSO/FSS terminals can be developed by industry once the APFD and EPFD limits are established. Moreover, the blanket licensing process need not be delayed pending industry adoption of NGSO/FSS sharing criteria because the Commission may simply issue the licenses subject to coordination with other NGSO/FSS systems.

Similarly, Motorola does not agree with proposal of KaStar Satellite Communications Corp, KaStarcom, World Satellite, LLC, and @Contact, LLC's (jointly,

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[11] The Commission's proposal not to include FS or MSS operation in the 19.7-20.2 GHz bands further reduces the potential for harmful interference between FS and FSS or MSS and FSS.

[12] Lockheed Comments at 23.

"KaStar") that the Commission defer spectrum sharing between GSO/FSS and NGSO/FSS systems pending resolution of sharing issues at the ITU.[13] At WRC-97, a regulatory regime was put in place to accommodate NGSO/GSO FSS sharing. Thus, there already is a firm basis for proceeding with blanket licensing of both types of systems in these bands. WRC-00 will only consider whether to confirm or modify the power limits provisionally adopted at WRC-97. Blanket licensing can and should proceed as soon as possible to provide manufacturers and system operators the lead time needed to design and prepare for mass distribution of ubiquitous earth terminals. Motorola strongly urges the Commission to expedite the blanket licensing process, avoiding all unnecessary regulatory impediments.

Accordingly, the Commission should proceed expeditiously with blanket licensing of NGSO/FSS and GSO/FSS terminals in the 19.70-20.2 GHz and 29.5-30.0 GHz bands once technical standards for GSO/FSS operation are established, including PFD and EIRP sharing limits and antenna off-axis limits. The Commission may issue such licenses conditioned on compliance with appropriate industry-developed technical criteria.

D. Motorola Also Supports NGSO/FSS Blanket Licensing in the 18.8-19.3 and 28.6-29.1 GHz Bands

In its Comments, Motorola stated that it agrees with the Commission that the reasons for instituting blanket licensing procedures are the same for both GSO/FSS and NGSO/FSS and that developing such procedures for NGSO/FSS systems in the 18.8-19.3 and

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[13] Ka-Star Comments at 16.

28.6-29.1 GHz bands is in the public interest.[14] To that end, Motorola disagrees with Hughes Electronics, Inc.'s ("Hughes") position that NGSO/FSS blanket licensing is premature without NGSO-NGSO sharing standards.[15]

II. THE COMMENTS GENERALLY SUPPORT THE COMMISSION'S PROPOSED TECHNICAL RULES

As it stated in its Comments, Motorola supports most of the Commission's technical proposals. So do the majority of commenters in this proceeding. However, Motorola does not agree with several of Hughes' positions with regard to the Blanket License Working Group Report ("BL-WG Report"), particularly concerning coordination principles, or with GE American Communications, Inc.'s ("GE American") suggestion about coordination nullification. Motorola also disagrees with Loral Space and Communications Ltd. ("Loral"), Pegasus Development Corporation ("Pegasus") and VisionStar, Inc. ("VisionStar") concerning adaptive power requirements. Further, Motorola finds several parties' positions with regard to antenna pointing requirements inadequate in an environment featuring ubiquitous deployment of earth terminals installed by non-professionals.

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[14] Motorola Comments at 18.

[15] Hughes Comments at 25-26. It should be noted that space station sharing issues exist in all parts of the Ka-band, not merely the NGSO/FSS primary band. Thus, Hughes' suggestion to delay blanket licensing specifically in the NGSO/FSS band is without merit. Moreover, due to the variety of orbital architectures that may be utilized by NGSO/FSS systems, guaranteeing *ab initio* compliance with criteria for full compatibility is at best a wishful notion.

A. Motorola Generally Agrees with the Blanket Licensing Working Group Report Concerning GSO/FSS Sharing

The BL-WG Report, representing the work of industry over a period of a year and a half, of which it was an active participant, provides the near-consensus of GSO/FSS licensees regarding the technical parameters required to implement ubiquitous small Ka-band GSO/FSS earth stations. The BL-WG focused primarily on developing two parameters which determine the downlink and uplink interference between adjacent GSO/FSS satellite networks, i.e., maximum clear-sky downlink power flux spectral density ("PFD") at the Earth's surface in dBW/m^2/MHz (to protect downlinks), and maximum clear-sky uplink off-axis effective isotropic radiated power ("EIRP") from transmitting earth stations in dBW/MHz as a function of off-axis angle (to protect uplinks).[16]

1. Motorola Can Accept the PFD and EIRP Values Set Forth in the Report

The BL-WG Report reflects the agreement of the vast majority of participating GSO/FSS licensees that the downlink PFD limits be defined in two reference bandwidths, with a 2 dB variation. The higher value of -118 dBW/m^2/MHz would apply on a per-MHz basis and therefore give protection to any narrow-band carriers that might be used. The lower value off

[16] Other issues such as earth station pointing accuracy and uplink power control were also addressed by this group, but a consensus was not reached. The BL-WG has requested "that the Commission provide a mechanism for the group to continue its work in these areas to reach conclusions and provide additional input to the Commission." Report of the GSO Ka-Band Blanket Licensing Industry Working Group, Conditions for Compatibility with 2° Orbital Spacing, November 18, 1998.

-120 dBW/m^2/MHz would apply when averaged across a 40 MHz bandwidth, i.e., the minimum bandwidth of any wide-band carrier.

The Report also reflects the evolution of licensees' proposed uplink values, with agreement by all except two participants on a compromise value of 25.0 dBW/MHz.[17] In this regard, it should be noted that Motorola agreed to a much higher EIRP value than it originally proposed in order to try to reach consensus.[18]

In considering the variation of off-axis EIRP spectral density with off-axis angle, the BL-WG was of the view that any rule eventually adopted by the FCC should maximize design flexibility in areas that did not affect adjacent GSO satellite interference.[19] Accordingly, the recommendations made in the BL-WG Report include an off-axis EIRP spectral density defined only for angular ranges from 2.0 degrees and greater, with blanket licensing defined as follows:

$X - 25 \log(\theta)$ dBW/MHz for $2.0° \leq \theta \leq 7°$

$X - 21.13$ for $7° < \theta \leq 9.23°$

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[17] It was noted that the current proposed European Telecommunication Standards Institute ("ETSI") off-axis uplink limit is 25.5 dBW/MHz at 2 degrees off-axis, independent of any uplink power control scheme. Report at 9; Motorola Comments at 12-13. Motorola noted that the extent to which international uplink EiRP off-axis levels outside the U.S. differ from the Commission's levels, international coordination of GSO/FSS networks will be complicated. Id. at 13. Motorola suggests that the Commission consider the ETSI approach for international coordination purposes.

[18] Report at Annex 2, A2-1.

[19] Report at 9-10. The Report, submitted to the Commission on November 19, 1998, notes that two licensees, PanAmSat and Hughes, did not concur with all of these recommendations. Id. at 10.

$X + 3 - 25 \log(\theta)$ dBW/MHz for $9.23° < \theta \leq 48°$

$X - 39.0$ dBW/MHz for $48° < \theta \leq 180°$

where X is proposed to have a value of +32.5 (corresponding to 25.0 dBW/MHz at 2° off-axis).

Motorola noted in its Comments that it had originally proposed an EIRP density of 15 dBW/MHz at 2.2 degrees off-axis, "a figure that was intended to limit the level of interference from adjacent satellite networks' Earth terminals to no more than a 6% increase n uplink system noise temperature."[20] Motorola has shown considerable flexibility during the BL-WG meetings and continues to agree, though reluctantly, to the current majority EIRP off-axis level of 25 dBW/MHz, using a $29 - 25 \log(\theta)$ antenna pattern. In general, Motorola would prefer the lowest figure possible, to limit intersystem interference and hasten the implementation of Ka-band services to the public.

Hughes states that it cannot accept the uplink or downlink parameters contained in the BL-WG Report, preferring instead an uplink EIRP figure of 20 dBW/MHz and a downlink PFD level of –118 dBW/m^2/MHz over any contiguous 40 MHz (as opposed to the majority BL-WG preference of an EIRP of 25.0 dBW/MHz, and a PFD of -118 dBW/m^2/MHz and –120 dBW/m^2/MHz over any 40 MHz).[21] Hughes' unique need for parameters different from those agreed to by all other participating Ka-band licensees (other than PanAmSat, commonly owned

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[20] Motorola Comments at 10.

[21] Hughes Report Separate Statement at 2. Pegasus "favors the retention of the Commission's existing PFD limits for GSO FSS operators, contained in RR 28 and Section 25.208 of the Commission's rules (-105 to –115/dBW/MHz, depending on the angle of arrival)." Pegasus Comments at 13, footnote omitted.

by Hughes) is discussed in its submissions in this proceeding.[22] The burden remains on Hughes, therefore, to offer a technical proposal that will accommodate all other Ka-band licensees' intended operations. Absent such a showing, and recognizing that Hughes stands virtually alone in its system architecture from other licensees, the Commission must be prepared to require Hughes to comply with the BL-WG Report technical parameters. Hughes and all other Ka-band licensees are otherwise at a technical stalemate, the latter being held as hostage to Hughes' system design specifications. This cannot be permitted.

2. Motorola Agrees With the Coordination Assumptions of the BL-WG Report

In the BL-WG proceedings, it was presumed that, among other things, exceeding the blanket licensing limits would be permitted only if the non-compliant GSO/FSS licensee coordinates the proposed operation with all U.S.-licensed satellite networks (or non- U.S.-licensed systems granted access to the U.S. market) that are "affected." While the full definition of "affected" was not resolved, it was generally understood that in the event any coordination agreement reached by a licensee exceeding the blanket licensing limits would be valid only as long as those operators who were parties to the agreement remain in their respective orbital locations.[23] If the FCC reassigned an orbital location to another licensee, any existing coordination agreement would not remain effective and another coordination agreement would be required for the blanket licensing limits to be exceeded. Any earth station not operating in

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22 Hughes Comments, Technical Appendix B.

23 BL-WG Report at 4-5.

compliance with the blanket licensing limits or otherwise coordinated would be licensed on an individual basis.[24]

Hughes asserts that the BL-WG Report includes coordination terms and conditions that vary from the original terms of reference of the BL-WG, and in any event are not addressed adequately.[25] To the contrary, the coordination presumptions contained in the BL-WG Report were discussed at length and represent both the informal input from Commission staff attending the meetings and the logical requirements based on general coordination principles. Indeed, the objective of the BL-WG was to identify technical parameters for small Ka-band GSO/FSS earth stations and to recommend values for such parameters in order to permit U.S.-licensed systems with large numbers of small earth stations to operate with acceptable levels of interference in two-degree orbital spacing – without the need to coordinate. It is axiomatic that situations in which PFD or EIRP levels exceed the agreed-upon limits must be contemplated. Otherwise, there can be no closure to the issue of interference avoidance in an otherwise ubiquitous earth terminal environment.

In sum, Motorola supports the approach suggested by the BL-WG Report, which is consistent with Motorola's position as explained in its Comments, i.e., that the same kind of flexibility that obtains in the Ku-band should apply to the Ka-band. As we stated, by this approach any non-compliant earth station would be required to coordinate with adjacent GSO/FSS systems along a total of 12 degrees of orbital arc, i.e., 6 degrees on either side of its

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24 Id. at 5.

25 Hughes Separate Statement at 1-2.

own GSO/FSS location.[26] Once such agreements are obtained, the non-compliant earth station operator would be permitted to transmit at the coordinated levels, and the adjacent operators would be bound by their agreement. A newly licensed operator would not be subject to these agreements and could require that its adjacent slot operators comply with the blanket licensing limits. There is, then, a practical incentive by all satellite operators to adhere to the blanket licensing limits, which Motorola believes represents the most efficient use of the available spectrum. Any other approach would preclude a newly licensed system operator from providing service consistent with the blanket licensing limits, in effect imposing the coordination agreement on the new licensee and precluding it from offering blanket licensed services like those offered by most other operators.[27]

B. Elliptical and Off-Set Antennas

The Commission's proposal regarding earth station performance is to impose the specified uplink power density envelope only in the plane of the GSO orbit, allowing a more

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[26] Motorola Comments at 17.

[27] GE American objects to the BL-WG Report to the extent it suggests that an established coordination agreement among satellite licensees should be nullified because the Commission reassigns an orbit location relevant to that agreement to another licensee. GE Comments at 3-4, BL-WG Report at 4-5. The BL-WG Report is not clear on this issue. If the FCC orbital location reassignment is simply a matter of change of ownership of an existing slot or satellite, no technical change or other event has occurred to warrant cancellation of the existing coordination agreement. That is, no change in the delicate PFD and EIRP balance between adjacent compliant and non-compliant operators has occurred. On the other hand, where a slot is newly assigned to a blanket license-compliant operator, the adjacent non-compliant operators should, if necessary, be required to normalize their operation to the blanket licensing limits in order to provide the most efficient use of the band.

relaxed EIRP density envelope under clear sky conditions in all other directions.[28] Loral suggests a clear weather EIRP density envelope curve which is relaxed by 3 dB from the uplink off-axis EIRP density composite curve it offers, which is virtually identical to the BL-WG composite curve.[29] Boeing, however, concludes that the Commission should maximize spectrum efficiency by amending Section 25.209 of the Rules so that sidelobe performance is uniform in all directions, to protect NGSO/FSS systems.[30]

In its Comments, Motorola noted that in order for inclined orbit GSO/FSS systems to achieve the same level of mutual protection as they would have were they not in inclined orbits, an EIRP limit outside the orbital arc is needed.[31] Moreover, limiting the relaxation outside the orbital arc to 3 dB provides some protection to NGSO/FSS systems planning to operate in the 29.5-30.0 GHz band.[32] Motorola, while agreeing in principle with Boeing, believes that the relaxation of 3 dB outside the GSO satellite arc is adequate to allow NGSO/FSS operation and to permit smaller antennas to assure 2-degree operation between GSO/FSS satellites.

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28 NPRM at ¶53.

29 Loral Comments at 10-11.

30 Boeing Comments at 4.

31 Motorola Comments at 14, n.29.

32 Id. at 14.

C. Adaptive Power

The Commission sought comment on how blanket licensees in the Ka-band would comply with Section 25.204 of the Rules, which requires earth stations to employ adaptive uplink power control or other methods of fade compensation.[33] The Commission proposes to require all operators seeking blanket licensing authority to submit a technical description of how the Commission's requirement will be met.[34] Loral suggests that such a showing should be on a confidential basis, and that the industry decide the method of implementation.[35] Pegasus, however, opposes any standards at this time, preferring to wait until there is "industry experience with this technology."[36]

Motorola believes that a maximum EIRP fade allowance should be determined and applied to all blanket licenses. Thus, if an operator chooses to exceed this level, coordination with all other licensees would be necessary.[37] Because the 29.5-30.0 GHz band is likely to feature blanket licensing, it is not appropriate or practical that the maximum power level be left undefined. Motorola suggests that the BL-WG forum be tasked to address the question concerning how much additional adaptive uplink power can be permitted, particularly in view of

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33 NPRM at ¶¶57-58.

34 Id. at ¶57.

35 Loral Comments at 11.

36 Pegasus Comments at 12.

37 Motorola Comments at 15-16.

the proposed ETSI standard and the likely international application of any standard that is applied.[38]

D. Antenna Pointing Requirements

Several parties commenting on the matter of earth terminal pointing accuracy requirements express the view that the Commission should refrain from adopting such rules until evidence is developed indicating that a problem exists, at which time use of automatic transmitter identification systems can be mandated.[39] One commenter, Loral, favors each licensee using whatever measure it feels best suits its system, provided the required uplink off-axis EIRP limits are met.[40] For its part, Pegasus does not recommend a standard due to lack of industry experience, but it would require a showing in each blanket license application of some method of assuring accurate pointing to assure earth stations' identification.[41] TIA-SOUS, taking a slightly different position, does not believe the Commission should adopt specific antenna pointing requirements, preferring that Ka-band GSO/FSS licensees be permitted to implement measures which are best suited to their systems.[42]

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[38] Motorola disagrees with Loral's suggestion that the technical showing under Section 25.204 to demonstrate compliance with uplink adaptive power requirements be offered on a confidential basis if that suggestion means that the trigger points and maximum values are not revealed. Such information is necessary to assure intersystem compatibility and to identify possible sources of interference.

[39] See, e.g., Boeing Comments at 5-6.

[40] Loral Comments at 13.

[41] Pegasus Comments at 13-14.

[42] TIA-SOUS Comments at 7-8.

Motorola strongly believes there should be a requirement for an antenna pointing accuracy scheme in each blanket licensee's application, to assure consistency among all operators and to avoid subsequent interference problems.[43] Specifically, Motorola supports the Commission's suggestion for a threshold pilot signal, plus automatic transmitter identification associated with all uplink transmissions.[44] This dual pilot/identification approach represents the simplest and most readily implementable means to assure that ubiquitous installation of earth terminals does not result in massive mutual interference between GSO/FSS uplinks. The Commission should adopt the pilot-identification approach as a blanket license application requirement.[45]

III. COMMENTERS FAIL TO OFFER JUSTIFICATION FOR ALTERING THE COMMISSION'S CONCLUSION REGARDING INTERSERVICE SHARING IN THE 19.3-19.7 GHz AND 29.25-29.5 GHz BANDS

Several commenters propose alternatives to the Commission's conclusion with regard to the 19.3-19.7 GHz and 29.25-29.5 GHz bands. None of these proposals, however, provides any net benefit over the current designations. Each would unnecessarily create significant risks of interservice interference that do not currently exist, and should therefore be

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[43] Motorola Comments at 17-18.

[44] Id. No commenting party suggests using other than a pilot and identification system.

[45] It makes most sense if there is a single technical implementation of the pilot-identification approach for all GSO/FSS operators. The BL-WG may be the most appropriate forum for providing this implementation.

rejected. Motorola and Iridium support the Commission's conclusion that there should be no blanket licensing in the 29.25-29.5 GHz band.

A. Bifurcating the 19.3-19.7 GHz Band Is Counterproductive

Pegasus proposes segmenting the 19.3-19.7 GHz band so that MSS feeder links (MSS/FL) and FS share the lower 150 MHz (19.3-19.45 GHz) on a co-primary basis, and MSS/FL and GSO/FSS share the upper 250 MHz on a co-primary basis (19.45-19.7 GHz). According to Pegasus, this proposal would allow MSS/FL gateways to share the lower portion of the band with FS and would permit a larger number of GSO/FSS terminals, using suitable mitigation techniques, to avoid interference with MSS/FL operations in the upper portion of the band. Pegasus argues that its approach would provide additional downlink spectrum for GSO/FSS. However, Pegasus' proposal would create a mixture of GSO/FSS-MSS/FL earth stations in a narrow band segment adjacent to an even narrower segment dedicated to MSS/FL-FS operations. The apparent purpose of this proposal is to increase the overall designation to GSO/FSS in the Ka-band, enlarge the spectrum available for FS in the 17.7-18.8 GHz portion of the band, and remove FS entirely from the 18.8-19.3 GHz portion of the band. Motorola and Iridium believe that the result of this proposal provides no benefit to any service, yet risks the current interservice balance in the 19.3-19.7 GHz band. Motorola and Iridium therefore object to Pegasus' proposal as counterproductive and inconsistent with the public interest.

Motorola and Iridium similarly object to the propositions by SBC Communications, Inc. ("SBC") that "the Commission should not place MSS/FL as a co-primary licensee in the 19.3-19.7 [GHz band]" and that MSS/FL should be downgraded to secondary

status in this band.[46] SBC's comments appear to be woefully outdated. SBC fails to recognize that the Commission (following the global allocations at WRC-95) already adopted the co-primary allocation for MSS/FL and FS in the 28 GHz First Report and Order (confirmed in the instant NPRM); that licenses have already been issued for MSS/FL in this band; and that the Iridium System has successfully coordinated under Part 25 of the Commission's Rules and is now operating gateway earth stations in this band in the U.S.[47] Moreover, contrary to SBC's assertions, the locations of current and future gateways for the Iridium and MACROCELL systems in the 19.3-19.7 and 29.1-29.25 GHz bands are on record at the Commission.[48] Thus, SBC's proposal to downgrade MSS/FL is without merit and should be rejected.

B. Imposing New Conditions on Terminal Deployment is Unacceptable

AirTouch suggests that the number of MSS/FL terminals deployed in the 19.3-19.7 GHz band be limited "in order to ensure that the band will still be available for share use with terrestrial FS users."[49] With regard to the 29.25-29.5 GHz band, Lockheed argues that "in order to protect the interest of future NGSO MSS systems while also allowing the GSO FSS

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46 SBC Comments at 4-5.

47 SBC's Comments contain several additional flawed statements. For example, SBC alleges "that any given FS receiver will have an Iridium satellite in its main beam for about 9 seconds each day." Yet, it is not at all clear how SBC arrives at this conclusion. Moreover, even if the assertion is correct it is not at all relevant unless the Iridium satellite is transmitting to the gateway earth station on a frequency that overlaps the frequency being used by the FS station and the FS station is within the footprint covered by the satellite while the satellite is transmitting. Id.

48 Id. at 5.

49 AirTouch Comments at 13.

operators to make efficient use of this spectrum band, the Commission may wish to identify a *limited* number of earth station sites to be used by future NGSO MSS systems with the requisite operational characteristics."[50] Then, it continues, the Commission "could restrict deployment of GSO FSS earth stations . . . within a certain number of kilometers from an NGSO MSS feeder link station."[51]

The current Commission MSS/FL-FS 19.3-19.7 GHz band plan adequately provides for both MSS/FL and FS operation, as does the 29.1-29.5 GHz band for MSS/FL-GSO/FSS operation. There is no justification for imposing earth station installation limitations in the absence of any indication of a technical requirement or operational need. Further, in the 19.3-19.7 GHz band, MSS/FL deployment is inherently limited by the needs of the operators, which typically require very few earth stations compared with the number of FS stations that may populate the band. Also, there already are limitations on MSS/FL stations in the 29.1-29.25 GHz band due to sharing constraints with LMDS. Further constrains are not warranted.

The proposals suggested by TIA-Wireless and the Fixed Wireless Communications Coalition ("FWCC"), to require MSS/FL earth stations using the 19.26-19.7 GHz band to locate in remote areas, provide 360 degree shielding of at least 25 dB to protect FS

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[50] Lockheed Comments at 21-22. Several commenters, as part of alternate band plans which would reserve more spectrum for FS, suggest co-primary status between FS and MSS/FL in the 19.26-19.7 GHz band. See Fixed Wireless Communications Coalition Comments at 16, GTE Service Corporation Comments at 7-8, TIA-Wireless Comments at 15-16. Motorola and Iridium oppose any suggestion to designate the 19.26-19.3 GHz band to FS and urges the Commission to adhere to the WRC-95 and WRC-97 decisions to designate the entire 18.8-19.3 GHz band for NGSO/FSS downlinks.

[51] Lockheed Comments at 22.

transmitters, and coordinate only those frequencies and arcs needed, are all unnecessary requirements on a shared band that currently satisfactorily serves the interests of both FS and MSS/FL entities.[52] Motorola and Iridium strongly oppose these TIA-Wireless and FWCC proposals.

TIA-SOUS and VisionStar, agreeing with Motorola, urge that the current MSS/FL band plan not be changed.[53] Iridium also opposes adopting blanket licensing in the 29.25-29.5 GHz band due to the intricate coordination requirements needed between fixed MSS /FL and FSS earth station operations.[54] Iridium further stresses the importance of reserving feeder link spectrum for the expansion of current and planned NGSO/MSS networks.[55]

In sum, Motorola believes that the current FS-FSS sharing rules pertaining to the 19.3-19.7 GHz and 29.25-29.5 GHz bands are adequate for the foreseeable future, providing FSS with opportunities for deployment on a coordinated basis with the MSS/FL gateway earth stations. Motorola therefore supports the Commission's conclusion that there should be no blanket licensing in the 19.3-19.7 GHz and 29.25-29.5 GHz bands.

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[52] Motorola and Iridium, as noted herein, finds no justification for expanding the band to include 19.26-19.3 GHz. See also TIA-Wireless Comments at 15-16.

[53] TIA-SOUS suggests further that ubiquitous GSO/FSS and FS should be added to the 29.25-29.5 GHz band a secondary basis. TIA-SOUS Comments at 5. Motorola believes, as it indicated in its Comments, that the 29.25-29.5 GHz band designations should remain exactly as the are. Motorola Comments at 19. See also VisionStar Comments at 11-12.

[54] Iridium Comments at 4.

[55] Id. at 3-4.

IV. CONCLUSION

Motorola supports blanket licensing in the Ka-band where NGSO/FSS systems are authorized, including the bands designated for GSO/FSS primary operation and NGSO/FSS secondary operation. Motorola also supports the majority of the Commission's technical proposals for blanket licensing of GSO/FSS and NGSO/FSS earth terminals, though it does not support some commenters' suggestions that would reduce spectrum efficiency, remove bandwidth designated for FSS operations, or unnecessarily delay implementation of Ka-band satellite services.

More specifically, Motorola supports the BL-WG Report concerning GSO/FSS sharing, including its near-consensus downlink PFD and uplink EIRP recommendations. Motorola also supports the BL-WG Report's assumptions and positions regarding coordination where there is reassignment of an orbital slot.

With regard to elliptical and off-set antennas, Motorola believes that the relaxation of 3 dB outside the GSO satellite arc is adequate to allow NGSO/FSS operation and to permit smaller antennas to assure 2-degree operation between GSO/FSS satellites. Motorola recommends that the Commission look to the BL-WG to resolve the matter of how much adaptive uplink power can be permitted, giving consideration to the proposed ETSI standard and the likely international application of any such resolution. On antenna pointing, Motorola believes that the only reasonable way to assure that ubiquitous installation of earth terminals in the Ka-band does not result in mutual interference between GSO/FSS uplink signals is to impose a standardized pilot signal and automatic station identification requirement in all blanket license applications.

Finally, as discussed in Section III, supra, Motorola and Iridium oppose the proposals to alter the current designation of the MSS/FL bands because they are contrary to the public interest, fail to provide any net benefits, and would seriously harm MSS operations.

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