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

In the Matter of	)	
	)	
The Establishment of Policies and	)	IB Docket 01-96
Service Rules for the Non-Geostationary	)	
Satellite Orbit, Fixed Satellite Service	)	
in the Ku-band	)	

COMMENTS OF HUGHES COMMUNICATIONS, INC.

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EXECUTIVE SUMMARY

Hughes supports the Commission's determination that different band segments comprising the Ku-band NGSO FSS allocation have differing operational constraints, and that these constraints must be taken into account in determining licensing and service rules. Hughes notes, however, that dividing the sub-bands into equal segments, and allocating a segment of each sub-band to each applicant poses significant problems. Such an allocation would result in a reduction of useable spectrum, limit carrier sizes and access methods, and ignore opportunities for segment sharing and locating compatible systems in adjacent segments. Instead, Hughes suggests that the Commission encourage and assist applicants to share technical information and to craft a negotiated solution, which is more likely to benefit all planned systems and more efficiently allocate spectrum resources.

Although the Commission proposes four spectrum-sharing plans, Hughes believes that no applicant is currently in a position to advocate any one of these plans, none of which are adequate to allow effective use of the allocated spectrum by all applicants. Each proposal includes its own set of technical challenges and creates varying disadvantages both to spectrum use and to variety and competition among systems. Some proposals may disproportionately disadvantage certain types of system designs. Furthermore, many technical issues need to be resolved before the proposals can be adequately analyzed. Finally, the NGSO FSS applications on file with the Commission do not currently contain sufficient technical detail to allow applicants or the Commission to determine the viability of each licensing proposal with respect to proposed systems.

However, the technical issues raised by the Commission's four proposed plans provide a useful starting point for discussions among the applicants. After identifying the relevant issues and completing any necessary study, the parties would then be in a position to identify their own requirements and create opportunities for effective sharing of the available resources through a negotiated settlement.

As to issues raised by the Commission's proposed service rules, the Commission should not add a requirement of "allocation of previously uncommitted funds" to the Commission's current financial qualifications standard. This unnecessary and unrealistic requirement has twice been considered and rejected by the Commission for reasons which still hold true today. The suggested addition is inconsistent with the policy underlying the financial requirements standard, and furthermore would impose unnecessary burdens on both the Commission and applicants. As an alternative means of oversight, Hughes proposes that a modified version of the current financial requirement standard would better serve the purpose underlying the current test. Requiring applicants to demonstrate the ability to fund a substantial portion of cost of construction, launch, and first year construction, combined with the Commission's milestone requirements, would identify adequately funded applicants, ensure timely system completion, and more closely reflect the current financial realities of financing global satellite systems such as proposed for Ku-band NGSO FSS.

With or without financial requirements, Hughes supports the application of the Commission's current milestone requirements. However, the proposed additional "bending metal" and CDR milestones are unwarranted, overly intrusive, and will result in an unnecessary drain on resources of both the Commission and applicants, and may have

other negative (such as anti-competitive) effects. Adding such requirements seems especially inappropriate at a time when the Commission has acknowledged that milestone oversight has consumed enormous Commission resources, and when the Commission has determined to undertake a broad review of milestones in general.

While the Commission proposes to apply the international coordination policy adopted in the Ka-band service rules proceeding, such a policy may not be appropriate for the Ku-band NGSO FSS. If the Commission requires international operations to conform to the U.S. band plan, licensees should not be required to adhere to particular service restrictions, such as "gateway-only" operations, where such restrictions would be unnecessary in international operations. Rather, the Commission should ensure that Ku-band licensees have flexibility to adjust their operations as necessary in other countries, subject to the obligation of all U.S. licensees to coordinate in good faith with other affected U.S. licensees.

Finally, Hughes briefly comments on: (i) blanket licensing of earth stations; (ii) the Commission's proposal not to require antenna reference patterns and determination of off-axis e.i.r.p. limits; (iii) the proposed coverage requirement; (iv) non-common carrier treatment; and (v) the proposal not to require reporting of unscheduled satellite outages. Hughes generally supports the Commission's proposals but notes that the appropriate result in many cases depends on the spectrum licensing approach that the Commission finally adopts.

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The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-band	))))	IB Docket 01-96

COMMENTS OF HUGHES COMMUNICATIONS, INC.

Hughes Communications, Inc. hereby submits its Comments in response to the Commission's Notice of Proposed Rulemaking[1] in the above-captioned proceeding. Hughes is interested in this proceeding as the applicant for two Ku-band NGSO FSS satellite systems—HughesLINK and HughesNET[2]—that will be subject to the Ku-band NGSO FSS service rules adopted by the Commission in this docket.

I. GENERAL SPECTRUM-SHARING ISSUES

The Commission recognizes in the NPRM[3] that the different band segments that make up the Ku-band spectrum allocation for the NGSO FSS have differing operational constraints. The Commission has restricted certain types of NGSO FSS operations to designated portions of the allocated spectrum, as different portions of

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1 *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-Band*, FCC 01-134 (rel. May 3, 2001) ("*NPRM*").

2 Application of Hughes Communications, Inc. for the HughesLINK Satellite System, FCC File No. SAT-LOA-19990108-00002 (filed January 8, 1999) ("*HughesLINK Application*"); Application of Hughes Communications, Inc. for the HughesNET Satellite System, FCC File No. SAT-LOA-19990108-00003 (filed January 8, 1999) ("*HughesNET Application*").

the allocated spectrum pose different sharing burdens for NGSO FSS systems. Therefore, the Commission has proposed (i) to divide the Ku-band spectrum designated for NGSO FSS service into six sub-bands (three uplink and three downlink sub-bands) that take into account the different existing uses and other characteristics of those sub-bands and (ii) to provide each applicant with access to each of the different sub-bands.[4]

Hughes agrees that the Commission must address the varying characteristics of the allocated spectrum in developing fair and appropriate licensing rules for Ku-band NGSO FSS. Hughes also agrees generally with the sub-bands identified by the Commission. However, while the Commission suggests that the DBS downlink band at 12.2-12.7 GHz may be suitable for use by NGSO FSS service links, Hughes believes that it is too early to tell whether such use is feasible. Depending on the terms eventually developed for MVDDS, this band may not be appropriate for consumer terminals.[5] Given this uncertainty, Hughes agrees with the Commission that the 12.2-12.7 GHz DBS band is not fungible with the 11.7-12.2 GHz band and therefore should be treated as a separate sub-band.

While Hughes supports the Commission's approach in identifying spectrum sub-bands with differing operational constraints, the allocation of segments within the identified sub-bands presents a more complicated issue. Giving each applicant access to an equal segment in each sub-band would provide a straightforward and easily-

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3 NPRM at ¶ 17.

4 *Id.*

5 *See 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 Frequency Range*, ET Docket No. 98-206, 14 FCC Rcd 1131 at ¶ 8 (1998).

administered way to divide the available spectrum among all applicants. However, this type of segmentation of the sub-bands could have several negative effects on all Ku-band NGSO FSS licensees.

Allocating equal segments in each of the six sub-bands would necessarily force each applicant to deal with considerable band-edge effects in each of the six sub-bands. All applicants would be required to control unwanted emissions outside each of their assigned segments; the practical result would be frequency guard-bands around each of the spectrum segments that the Commission assigns to applicants in each of the six sub-bands. While this situation would result from any spectrum segmentation, the extremely narrow segments likely in this case would cause the aggregate amount of guard-band spectrum to be disproportionately large relative to the applicants' useable spectrum in each sub-band, thereby utilizing the allocated spectrum very inefficiently.

Such narrow segments would place constraints on the carrier sizes and access methods that licensees could employ, and would require each applicant to control very strictly intermodulation noise components created outside each segment. These constraints may, in turn, result in more linear operation of satellite and ground terminal high powered amplifiers and, therefore, require more costly satellite payloads and ground terminals. Finally, the size of the guard bands required for a given applicant's segment and the type of filtering that a given applicant would need to employ may depend on the type of systems that are located in adjacent band segments. In this respect, certain systems may be more compatible than others for operations in adjacent band segments.

In addition, the Commission's proposal to segment each of the sub-bands among all applicants is premised on the assumption that all applicants will benefit from

access to each of the sub-bands present in the Ku-band. However, this assumption may not be accurate for all of the types of systems proposed. For example, some systems may not require extensive use of gateway bands, but may need greater access to service link bands. Systems employing a "full-mesh" connectivity approach, rather than a forward-reverse link, gateway-driven approach, provide an example of such a system. Thus, the Commission's approach for allocating spectrum in each of the sub-bands should also take into account the unique characteristics of the system designs of each applicant and maximize the efficiency of use of the allocated spectrum.

In view of the spectrum inefficiencies associated with segmentation of the Commission's identified sub-bands and the need to account for differences in system design, Hughes suggests that negotiations among the applicants, as assisted by the Commission, would result in other, more efficient, means of sub-band or segment allocation, which would better serve all applicants' needs and would avoid or reduce the problems associated with the Commission's proposed approaches. If, for example, as in the case of "full-mesh" systems, some applicants would be better served by less access to gateway bands and greater access elsewhere, then coordination among the parties could allow both gateway and non-gateway sub-bands to be divided into fewer segments. The same benefit would result if applicants determined amongst themselves that their systems would benefit from using segments in certain sub-bands but not others. Such coordination would reduce the band-edge problem by reducing the number of guard bands and the size of guard bands relative to useable spectrum, and would improve operations for all systems.

Furthermore, if applicants shared details regarding proposed systems and cooperated to determine which systems would be located in neighboring segments, the types of filtering and the necessary size of guard bands could be determined to optimize operations and maximize use of available spectrum. Applicants could also coordinate the location of systems using different carrier sizes to allow flexibility of systems types and promote effective operations. As a general matter, determining segment allocation on the basis of specific system design and negotiation between the parties will result in more effective use of the available spectrum and will promote the public interest by allowing greater variety in system design and more effective operation for each system.

II. SPECTRUM SHARING OPTIONS

The Commission asks for comment in the NPRM on four distinct options that could be used to assign spectrum to applicants for NGSO FSS systems: (i) Flexible Band Segmentation, (ii) Dynamic Band Segmentation, (iii) Avoidance of In-line Interference Events, and (iv) Homogeneous Constellations.[6] The Commission also outlines three principles that it seeks to advance with the proposal of these options.[7] As discussed above, Hughes agrees with the Commission that the spectrum available for NGSO FSS systems is not fungible, but Hughes recommends that the Commission take into account that all applicants may not have equal requirements in terms of which sub-bands they will be able to use. Hughes fully supports the Commission's other articulated principles:[8] (a) that the Commission's ultimate regulatory framework should not favor any particular technology or operational method, (b) that the Commission should

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6 NPRM at ¶ 16.

7 NPRM at ¶¶ 16-19.

maximize spectrum availability for operational systems while accommodating the needs of all applicants and (c) that the public interest is well-served if the Commission encourages cooperation and negotiated arrangements between NGSO FSS applicants and licensees.

As to the proposed spectrum-sharing plans, Hughes strongly believes that neither Hughes nor any other applicant is in a position at this point in time to recommend any one of the four options proposed by the Commission. As discussed in detail below, each of the proposals has significant disadvantages that would make any one of them, by itself, inadequate to allow effective use of the allocated spectrum by all applicants.

Furthermore, an adequate evaluation of the four options or any combination of options would require specific technical information regarding each proposed system. The system applications filed by the various applicants for Ku-band NGSO FSS systems simply do not provide sufficient technical detail to permit the detailed analysis of all proposed systems that is necessary to unequivocally recommend and commit to a licensing approach.

Finally, while the Commission's proposals build upon the considerable amount of work that has been carried out on GSO/NGSO interference analyses,[9] as discussed below, there still are many technical issues that need to be studied and resolved before the Commission and the applicants can fully understand and define the range of

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8 *Id.*

9 Articles S21 and S22 of the ITU Radio Regulations provide recommended epfd and aggregate epfd limits for operation of Ku-band NGSO FSS systems with terrestrial fixed service systems and GSO fixed satellite service systems, respectively. The ITU-R Study Group 4A document 4A/39 discusses frequency sharing between NGSO fixed service systems and provides some guidance on quantitative values for avoidance angle mitigation techniques.

spectrum-sharing options available generally to accommodate the pending Ku-band NGSO FSS applications. For example, the study of the avoidance angle needed to mitigate in-line interference between or among NGSO FSS systems is only in its early stages, and, thus, important information that is critical to the evaluation of the feasibility of this sharing technique is not yet available.

Accordingly, at this time, Hughes's recommended licensing approach for Ku-band NGSO FSS applicants is for the Commission to assist the applicants in resolving any issues regarding the exchange of technical information and then to request that the applicants engage in negotiations toward a mutually-agreeable licensing solution. Negotiations among the parties have not yet progressed beyond initial stages because of the serious concerns of parties about the ability to share technical information consistent with the obligations imposed by the International Traffic In Arms Regulations (ITAR). Hughes believes that, with the Commission's assistance, these issues could be resolved with the U.S. government, negotiations among the parties could be facilitated, and all parties would be able to exchange the technical information necessary for evaluation and selection of a spectrum-sharing solution.

Negotiations and an eventual cooperative agreement among the applicants should allow for the development of a spectrum-sharing plan that would benefit all parties by being specifically tailored to the needs of each service and optimized to integrate the applicants' specific technical and operational requirements. For example, as discussed above, planned carrier sizes may determine the need for specially tailored segment allocation. Based on system design and objectives, applicants may determine that certain services could usefully share spectrum (and resort to a method similar to the

Avoidance Of In-Line Interference Events option) while others would benefit from discrete allocations. Technical requirements and business plans may also allow applicants to determine how best to allocate available resources over time (resulting in an approach closer to Flexible Band Segmentation, Dynamic Band Segmentation, a combination of the two, or another approach).

Hughes believes that the technical issues raised by the Commission's four proposed plans provide a useful starting point for discussions among the applicants. After identifying the relevant issues and completing any necessary study, the parties would then be in a position to identify their own requirements and create opportunities for effective sharing of the available resources through negotiated coordination.

In the context of Hughes's overarching recommendation described above for Commission-facilitated discussions among the applicants, Hughes provides the following comments on each of the Commission's four proposed licensing options:

A. Flexible Band Segmentation (Option I)

The major, and perhaps insurmountable, disadvantage of the Flexible Band Segmentation option is a limitation on the capacity of the system due to the severe limitation in assigned bandwidth. Simply put, guaranteed access to only 70 MHz of paired spectrum suitable for communications with ubiquitous earth terminals (assuming that the Commission accommodates all seven applicants equally in the paired 500 MHz of "clean" spectrum at standard Ku-band) is insufficient -- both technically and economically -- to support any multi-billion-dollar advanced technology system designed to deliver broadband capability. Further, the necessity of having numerous guard bands

reduces the amount of spectrum that can be used in the provision of service, weakening the commercial viability of any related investment.

The Commission should also consider whether different portions of each of the six sub-bands are more desirable. For example, while the Commission has identified the sub-bands based upon the different services allocated to use the spectrum in those sub-bands, some portions of the sub-bands shared with the terrestrial fixed service may be more heavily populated by deployed fixed service users. Also, the usage of the sub-bands identified by the Commission is likely to differ internationally, which is an issue that Hughes discusses in more detail below.

As noted above, the segmentation of each sub-band into separate sub-band segments for each applicant creates significant problems by increasing band-edge effects and limiting operational characteristics. At the very least, under this approach, some initial coordination between applicants would be required to determine guard band allocation and the type of filtering needed. However, the system applications on file do not include sufficient information to allow applicants to determine these necessary specifications, or to allow applicants to determine if, even with this information, the Flexible Band Segmentation proposal will support any of the proposed systems. The Commission should encourage discussions between applicants so that, at the least, they can determine if this spectrum sharing option is potentially feasible.

B. Dynamic Band Segmentation (Option II)

This option raises many of the same issues as Flexible Band Segmentation. Additionally, the Dynamic Band Segmentation option results in more difficult frequency (and resource) planning and creates regulatory risk because when new

systems become operational, existing systems will experience a series of reductions in bandwidth and capacity. This effect runs counter to business expectations in launching a new satellite system, namely that system capacity requirements will increase with time, as the system's customer base increases. Thus, while this option provides more capacity initially than Option I, it provides that capacity to the early operators at a time when more modest capacities are likely needed, and may not provide any more capacity than first option as markets grow with time.

An additional deficiency is that reallocation of the band segments assigned to an existing operator each time a new operator becomes operational may require downloading of new software to the hundreds of thousands of user terminals, in order to adjust the air interface parameters. This procedure will add significant operational complexity.

For both Options I and II, the Commission should account for the fact that licensees that move forward with their Ku band NGSO FSS systems under such a licensing approach and make the enormous financial investment necessary to do so, will likely only make such an investment based on assumptions about how many other licensees will be able to implement their Ku band NGSO FSS systems and that the spectrum allocated to systems that do not implement will be made available not to new entrants, but to initial Ku band NGSO FSS systems that have implemented their licenses. Assuming a competitive environment for Ku band NGSO FSS services, such a limitation should be reasonable and in the public interest.

C. Avoidance of In-Line Interference Events (Option III)

The Avoidance of In-Line Interference Events option could permit a significant reduction in interference, especially if combined with link balancing techniques, but at the cost of a significant increase in system complexity and increased inter-system coordination. When in-line interference occurs, either a handoff is required to another satellite (satellite diversity) or frequency isolation needs to be employed, involving either shutting off transmission while in-line or splitting the available frequency band for in-line events. This option requires much closer coordination between the interfered with and interfering NGSO systems. Ephemeris data, characteristics of the satellite and ground antenna patterns, information on expected aggregate interference (or traffic) and details of the air interface and link margins are needed for such coordination to occur.

As an initial matter, Hughes notes that this option may impose unequal burdens on systems depending on their overall design. For example, "full-mesh" systems or other systems that rely on numerous, small earth stations may be harder pressed to mitigate in-line interference events than systems designed around gateway terminals. For example, near a populated urban area (*e.g.*, New York City), a gateway-driven system may have little or no trouble avoiding interference, since it would likely have a small number of gateway stations to serve the entire area. Avoidance of interference events would require relatively little coordination for these systems. However, a "full-mesh" system would have to be able to coordinate and effect handoffs or frequency isolation for a great number of end-user terminals simultaneously. This frequency coordination function could exceed system capacity entirely. In addition, the information required for

coordination alone would create a significantly disproportionate burden on operators of these systems.

Consistent with the Commission's articulated licensing principles,[10] the Commission should take care not to disadvantage system designs that utilize a "full mesh" approach over systems that utilize a gateway-driven approach. Full mesh systems offer considerable flexibility for deployment and redeployment of capacity as markets grow and evolve, and although gateway-driven systems also have advantages, the Commission should not inadvertently preclude one approach or the other in selecting a licensing approach.

Another important consideration related to this option is the avoidance angle needed between NGSO systems because this angle determines the frequency of in-line events for given interference levels that could be considered acceptable. ITU-R Study Group 4A Documents 4A/93 and 4A/Temp/81 present data on these sharing criteria and avoidance angles between LEO, MEO and HEO systems. These avoidance angles vary from five to twenty degrees depending on the selection of interfered with and interfering systems. In these 4A Documents, interference-to-noise ratios (I/N) from 0 to -10 dB were considered as threshold values depending on the overall link margins available with 10% being the maximum percentage of time considered acceptable for in-line events.

Most of the simulations analyzing this spectrum sharing option assume the interfering system has uniformly distributed earth stations on the order of 1000 km apart. However, realistic traffic distributions may have highly non-uniform distributions of user

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10 NPRM at ¶ 16.

terminals concentrated in and around cities. This clustered distribution of user terminals may place burdens on the satellite network that needs to carry out handover or frequency isolation quickly for large numbers of ground terminals to avoid an in-line interference event. Clearly, studies that utilize more realistic traffic distributions are needed to determine the feasibility of this option.

With regard to the SkyBridge proposal of a "+/-" 10 degrees avoidance angle, it is clear from Table 2 of document 4A/Temp/81 referred to above, that avoidance angles as large as twenty degrees may be needed, especially between LEO/MEO or LEO/HEO systems using this sharing technique for I/No values of –10 dB. However, Hughes does agree in concept with the idea that link balancing techniques should be employed because these techniques appear to offer significant reductions in interference for in-line events.

D. Homogeneous Constellations (Option IV)

If this mitigation technique is selected, it could lead to acceptable interference levels, with less complex operational procedures than the In-Line Event Avoidance option. To carry out this option the family of constellations must be formed by:

(1) Carrying out interleaving within the same orbital plane;

(2) Orbital planes are interleaved from one constellation to another;

(3) Constellations which combine (1) and (2).

It is obvious that this option will require complete coordination between operators, both in the design and operation of the systems, as well as possible system redesign to conform to a single type of constellation.

These requirements highlight the disadvantages associated with such an approach. The constraints placed on an operator's system design by this mitigation option may also stifle innovative approaches taken by some operators, when trying to compete with other operators, for the same markets and services. The resulting harmonized constellations may no longer provide optimal solutions for each operator to offer competing services. Last, while all Ku-band NGSO FSS satellite operators may be (perversely) equally disadvantaged by this option, these satellite systems must also compete in the marketplace with terrestrial systems, and this mitigation technique may disadvantage all satellite operators vis-à-vis terrestrial operators.

There are also questions about how such a harmonization of systems would be implemented. Is it to be carried out by harmonizing all LEO systems, then all MEO systems and finally all HEO systems? In this case, interference between each of these harmonized systems must still be resolved. An alternative might be to allow only a single class of constellation and require all systems to be harmonized to this class of system. This process of harmonization needs further work to determine how to accommodate all NGSO candidate systems.

With regard to the specific homogenous constellation approach proposed by Virtual Geo, their proposed HEO system (as do most HEO systems) would spend most of its orbital period transiting the apogee, *i.e.* that portion of the orbit that is normally used for communications services. While the HEO appears to remain in a chosen position over the earth's surface for a significant period of time, other NGSO constellations do not have the same properties. Alternatively, the selection of other NGSO constellations by an applicant may be made because they can provide certain

performance and service capabilities that a HEO cannot. For example, a LEO system can offer much lower propagation delay and therefore, potentially end-to-end service comparable to terrestrial systems. However, if other constellations, such as HEO or MEO, are permitted, then as shown in document 4A/Temp/81, the exclusion angles required (as between the HEO and the LEO constellations) may be as large as 20 degrees.

If only one class of NGSO constellations was allowed, be it LEO, MEO or HEO, and all systems had harmonized constellations within this class, then the spectrum sharing problem could be resolved. Of, course, the fundamental problem with such an approach is that each class of constellations has certain advantages and disadvantages when considering service and performance capabilities as well as the complexity necessary to provide these capabilities. It is not evident that the Virtual Geo solution should be given preference over consideration of other HEO constellations or other classes of NGSO constellations (LEO and MEO). Indeed, the Commission can increase the possibility that the public receives the widest range of service capabilities by allowing all classes of NGSO systems to be licensed and implemented.

However, if the Commission decides to implement this option, in one form or another, the Commission must, as a matter of fairness, provide all Ku-band NGSO FSS applicants the opportunity to amend their applications to take into account the constellation type or types selected by the Commission.

III. EARTH STATION LICENSING

A. Blanket Licensing

Hughes agrees with the Commission that blanket licenses are an appropriate licensing mechanism. Blanket licensing will facilitate ubiquitous deployment

of end-user devices and encourage efficient use of spectrum overall.[11] As the Commission has noted before, blanket licenses facilitate broad deployment by making it simple and inexpensive for consumers and small businesses to purchase and install equipment. Sparing consumers the cost and effort of registration or licensing will serve the public interest by giving more people access to a wider choice of competitive services. Hughes also notes that it has proposed a streamlined licensing approach for satellite earth stations that utilize Ka band spectrum that is shared on a co-primary basis between satellite and terrestrial wireless systems.[12] The Commission should consider whether such an approach is feasible at Ku band as well.

Hughes opposes, however, the Commission's proposal to require an annual report on the number of user terminal earth stations actually brought into use under the blanket license authority.[13] The information required by this report is competition-sensitive, and the information does not serve any useful purpose for the Commission. Licensees would already be sufficiently incented to deploy the maximum number of earth terminals authorized under the blanket license, having made the enormous investment in constructing and launching the space segment of the system to timely meet any space segment construction milestones. Thus, additional Commission oversight in this area is unnecessary.

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11 *See 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, 15 FCC Rcd 13430 (2000) ("*18 GHz Order*").

12 *See FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service That Share Terrestrial Spectrum*, IB Docket No. 00-203, FCC 00-369 at ¶¶ 98-99 (rel. October 24, 2000).

B. Antenna Reference Pattern and Determination of Off-axis E.I.R.P. Density Limits

The Commission proposes in the NPRM to mandate neither an earth terminal antenna reference pattern nor an off-axis e.i.r.p. density limit for NGSO FSS earth stations.[14] The Commission notes that while mandating specific reference patterns and e.i.r.p. limits may facilitate spectrum sharing among applicants, such requirements will also add regulatory burdens and costs and may threaten commercial viability of Ku-band NGSO FSS systems.[15]

In contrast, Hughes does not believe that there is sufficient information at this time to determine whether mandating particular reference patterns or e.i.r.p. limits will benefit spectrum sharing and outweigh the costs and burdens of such requirements. The need for power limits and antenna reference patterns will depend largely on the type of spectrum-licensing plan eventually applied by the Commission. Licensing approaches that require less coordination among applicants (such as Flexible Band Segmentation or a similar approach) likely would not require specific antenna patterns and limits. However, approaches requiring significant coordination, especially where applicants are utilizing the same spectrum at the same time (for example, in an Avoidance of In-Line Interference approach), may require particular antenna patterns and power density limits to allow all systems to operate effectively. In such a case, coordination among the parties -- perhaps in the form of an industry working group -- would be the most effective means

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13 *See* NPRM at ¶ 46.

14 NPRM at ¶¶ 48-49.

15 NPRM at ¶ 48.

of determining a set of antenna patterns and off-axis e.i.r.p. power density limits that would facilitate spectrum sharing.

IV. SERVICE RULES

A. Coverage Requirement

The Commission proposes to apply a coverage requirement whereby Ku-band NGSO FSS would be required to provide continuous service throughout the fifty states, Puerto Rico, and the US Virgin Islands, and would be capable of serving locations as far north as 70 degrees latitude, and as far south as 55 degrees latitude, at least 75% of the time for every 24-hour period.[16] The proposed coverage requirement is generally reasonable and seems calculated to promote the public interest. Both of Hughes's proposed Ku-band NGSO FSS systems meet and in fact exceed this requirement by assuring single satellite visibility at +/- 70 degrees latitude for more than 75% of the time in each 24-hour period.

B. Financial Qualifications

The Commission states in the NPRM[17] that, should a spectrum-sharing plan prove incapable of accommodating all applicants, the Commission will apply a financial qualifications test, as it historically has done when potential applicants have requirements that apparently exceed the available orbital or spectrum resources. In such a case, the Commission proposes to apply its current requirement[18] of demonstrating internal assets or committed financing sufficient to cover costs of construction, launch,

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16 NPRM at ¶ 51.

17 NPRM at ¶¶ 52-53.

18 *See* 47 C.F.R. § 25.140(c).

and first year operation for the entire system. However, the Commission further proposes to require "the commitment of funds not previously committed for any other purpose," which funds would be "separate and apart" from funds required by the applicant for any other licensed system.[19]

The Commission's current financial qualification standard has been in place since 1985 and generally has proven effective. As noted below, however, the application of such a test in the case of global NGSO systems is not appropriate. Rather, some modified form of this standard may be more suitable.

By contrast, the "allocation of previously uncommitted funds" proposal in the NPRM is an unnecessary and unrealistic requirement that the Commission has already twice considered and rejected. The reasons for the Commission's rejection of this approach still hold true today. Such an approach is inconsistent with the policy and purpose of the Commission's financial qualifications standard, ignores the realities of business generally and the satellite industry in particular, and would impose unnecessary burdens on both applicants and the Commission.

1. *The Commission's Financial Qualification Standard*

The Commission's financial qualification standard was first developed in the Domestic Fixed-Satellite Service proceeding in 1985. In 1983, the Commission initially required that an applicant demonstrate its financial qualifications, as well as "an ability to proceed promptly with construction and launch of the proposed satellites."[20] In

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19 NPRM at ¶ 53.

20 *Memorandum Report and Order, In The Matter Of Filing Applications For New Space Stations In The Domestic Fixed-Satellite Service*, 93 F.C.C. 2d 1260, April 27, 1983, at ¶ 4 ("*1983 Processing Order.*")

1985, the Commission clarified and explained the financial qualification standard,[21] requiring that applicants "demonstrate the financial capability to construct, launch, and operate for a year their proposed systems immediately upon grant."[22] The Commission explained that applicants could demonstrate their financial capability by supplying documentation of internal funds (current assets or operating income) or committed and non-contingent financing from outside sources.[23]

As the Commission has consistently explained, the financial qualification policy is designed "to make efficient use of spectrum by preventing underfinanced applicants from depriving another fully capitalized applicant of the opportunity to provide service to the public."[24]

The Commission's practice of examining internal financial resources is properly tailored to the goals of the financial qualification standard because it provides a means to assess the ability of the applicant to raise the needed financing and deploy the system.[25] Under the Commission's longstanding approach, "current financial capability"

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21 *Report and Order, In The Matter of Licensing Space Stations In The Domestic Fixed-Satellite Service*, CC Docket No. 81-704, 58 Rad. Reg. 2d, (P&F)(1985)("*1985 Licensing Order*").

22 1985 Licensing Order at ¶ 11.

23 1985 Licensing Order at ¶ 13-14.

24 NPRM ¶ 52. *See also, e.g., Second Report And Order, In The Matter Of Amendment To The Commission's Rules To Allocate Spectrum For, And To Establish Other Rules And Policies Pertaining To A Radiodetermination Satellite Service*, Gen. Docket No. 84-690, 104 F.C.C. 2d 650 (1986), at ¶ 23 ("*Radiodetermination Order*") (financial qualifications test "ensures that the orbit-spectrum resource is not tied up by entities unable to fulfill their plans, and also serves to discourage the filing of speculative applications").

25 "[T]he availability of internal funds sufficient to cover a system's costs provides adequate assurance at the time the Commission acts on the application that the system can be built and launched." *Report and Order, Amendment of the*

as indicated by current assets (or operating income) means *funds or the demonstrated capability to obtain funding*. As the Commission explained in the 1985 Licensing Order,

> The availability of internal funds sufficient to cover the system's investment and first-year operating costs provides adequate assurance that the system can be built and launched. *Current assets. . . provides a measure of a company's ability to raise funds on the basis of its on-going operations*. This measure is one we have used since 1983. . . and is an indication of a company's ability to finance its system promptly upon grant.[26]

Thus, the Commission's existing, time-tested financial qualification standard is appropriately targeted at the policy goals identified by the Commission in the NPRM.

2. *The Commission Has Twice Rejected Financial Requirements Similar to The Current Proposal.*

In the 1985 Domestic FSS NPRM, the Commission proposed a requirement that would have required a specific allocation of otherwise "uncommitted capital assets" to the proposed system together with "an explicit commitment from management that these assets will be used for the proposed satellite system."[27] For reasons that apply equally as much today, the Commission rejected that approach.

This previous proposal was essentially the same as the Commission's current proposal requiring "a commitment of funds not previously committed for any other purpose" that would be "separate and apart" from funds required for operation of

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Commission's Rules To Establish Rules And Policies Pertaining To A Mobile Satellite Service In The 1610-1626.5/2483.5-1500 MHz Frequency Bands, CC Docket No. 92-166, 9 FCC Rcd 5936 (1994), at ¶31 ("*Big LEO Order.*") "[A] determination of an applicant's financial ability helps to ensure that service is promptly made available to users." Radiodetermination Order at ¶ 23.

26 1985 Licensing Order at ¶ 13.

27 1985 Licensing Order at ¶ 12.

other systems.[28] In both cases, the applicant would be required to identify and commit funds sufficient to support the proposed system, which funds presumably would not be available for any other use thereafter. Under such a proposal, and contrary to the Commission's customary approach, an applicant's "current financial capability" presumably would be determined by measuring specifically allocated funds against the costs of construction, launch and maintenance.

In the 1985 Licensing Order, the Commission rejected the "committed funds" proposal as being both unnecessary and impractical. Most important, the Commission made clear that requiring applicants to set aside funds specific to the project did not further the goals of the financial qualification requirement, because the commitment of specific funds "provides little additional assurance that the system will in fact be built."[29]

The Commission acknowledged that the extra requirement was unrealistic given the realities of the satellite industry and general business practices. The Commission noted and concurred with comments explaining that companies might not be willing or able to set aside specific assets for projects possibly more than three years in advance, and that an unalterable commitment of such funds would not be practical given the realities of business and credit arrangements.[30]

The Commission revisited the issue of strict financial qualifications in the "Big LEO" proceeding in 1994 and *again* rejected a proposal that would have required

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28 NPRM at ¶ 53.

29 1985 Licensing Order at ¶ 13.

30 1985 Licensing Order at ¶ 12.

proposed systems to be supported by a showing of specific, earmarked funds.[31] Instead, the Commission adopted an identical standard to the one it had outlined in the 1985 Licensing Order.[32] The Commission reaffirmed that an applicant's current assets are examined because they indicate that applicants have or can raise the necessary capital:

> ...[A]s in the domestic fixed-satellite service, we require only a demonstration of current assets or operating income sufficient to cover system costs. *Current assets . . . provide a general measure of a company's ability to finance the project itself or to raise funds from lenders and equity investors on the basis of its on-going operations.* Highly capitalized companies possess more collateral and, thus, are in a better position to borrow money than thinly capitalized companies.[33]

While the Commission has rejected the "separate funds" proposal as inappropriate and unnecessary in both the Domestic FSS and Big LEO proceedings, other factors weigh against the new proposal as well.

Requiring committed and specific allocation of funds to a proposed Ku-band NGSO FSS project would entail significant administrative and managerial burdens on applicants. Documentation of current assets or operating income on a yearly balance sheet requires little or no additional effort on the part of an applicant. However, identification of funds allocated specifically to the Ku-band project, as well as continuing documentation of all the other finds and assets from which the Ku-band funds must be "separate and apart" requires significant and ongoing effort and reporting. Depending on

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31 In response to a proposal that management commit funds specifically to the applicant's proposed Big LEO project, the Commission concluded, "[a]s we stated in adopting the domestic fixed-satellite standard, we will not require management to set aside specific funds for the system." Big LEO Order at ¶35.

32 Big LEO Order at ¶ 30.

33 *Id.*

an applicant's corporate structure, accounting procedures, and internal audit or reporting procedures and schedule, this process could impose significant costs and effort.

Reporting and monitoring costs, however, would be minor compared to the indirect effect such a requirement would have on an applicant's ability to do business. The requirement to lock up enormous quantities of funds or commit assets for significant periods of time would seriously hamper an applicant's management flexibility in other areas, and may paradoxically create obstacles to the prompt deployment of the proposed Ku-band systems.[34] The allocation of assets in this manner may hinder an applicant's ability to obtain financing, could be prohibited by credit and other financing agreements already in place, and could conflict with existing agreements. Moreover, such a requirement would also be ill-advised from a money-management perspective and may result in a less than optimal use of funds on hand. In addition, reporting internal allocations of funds and assets is unnecessarily intrusive and requires unwarranted disclosure of corporate processes and strategy, which could have negative financial and competitive effects on the applicant.

The proposed requirement would impose unnecessary and serious administrative burdens on Commission staff. The Commission wisely declined in 1985 to take on the additional task of "a rigorous and burdensome parsing of applicants' financial statements."[35] If the Commission truly wished to determine that funds were allocated exclusively to a Ku-band project, staff would have to essentially maintain an

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[34] For example, assets required to be committed exclusively to the proposed project presumably would not also be permitted to serve as collateral for secured financing, could not be allocated to R&D costs common to two projects, and could not be used to pay off debts and improve future credit terms.

[35] 1985 Licensing Order at ¶ 10.

open audit of the applicant's finances. A mere statement on an applicant's balance sheet or other document that certain funds were allocated to the proposed project could not ensure that the requirement was being met. To fully enforce the new requirement, the Commission would need extensive and ongoing documentation of cash outlays, evidence of authorized charges against the proposed project, balance transfers between subsidiaries and departments, and the like.

Finally, the increased burden imposed on applicants and Commission alike would be wholly unnecessary. Unless the commitment of funds (and the Commission's oversight of the applicant's finances) imposes a continuous obligation, it will be meaningless. As the Commission noted in the 1985 Licensing Order, "management can withdraw a commitment as easily as it can make one, and therefore this commitment provides little additional assurance that the system will in fact be built."[36] Even as a continued (and far more burdensome) obligation, the requirement will not add any meaningful information to help distinguish between those applicants who have the current financial ability to proceed with their systems and those who will spend a great deal of time seeking financing and possibly never succeed.

Because the significant burdens of the proposed additional "committed funds" requirement would not provide any concomitant benefit to the Commission or the public, the Commission should reject the proposal as it has done twice in the past.

3. *Alternative Means Of Oversight*

A cooperative spectrum sharing agreement among all applicants in the current processing round should obviate the need for strict financial qualifications.

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[36] 1985 Licensing Order at ¶ 13.

However, in the event that such an agreement is not reached, Hughes proposes an alternative means of oversight to ensure that licensees will timely commence service.[37]

Hughes has long supported the application of financial qualifications as a means of ensuring that only those applicants likely to complete their proposed systems are licensed. The Commission's current financial qualifications test -- which focuses on current assets and operating income -- is a well-crafted response to the types of satellite systems for which it originally was developed.

However, the current standard was developed when satellite licensees were launching a handful of spacecraft at a time -- one or two spacecraft at a time was the norm. Under such circumstances, requiring internal funds or committed financing sufficient to cover 100% of the costs makes sense. By contrast, the global, multi-spacecraft networks proposed in this processing round are enormously more expensive and complex. The industry's experience with the "Big LEO" systems testifies to the fact that these types of networks can only be realized by extensive, global partnerships.

Because systems of the type proposed in this proceeding must, as a practical matter, be developed though strategic partnerships or complex funding arrangements, it is not feasible to expect a Ku-band NGSO applicant to be able to show the financial capability to fund the full system by itself. Such a requirement would be out of step with the present realities of the industry and would fail to identify those applicants that have the ability to generate the funding required or to enter into the types of alliances that will facilitate system deployment.

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[37] See NPRM at ¶ 53.

Instead, for the types of multibillion-dollar global systems proposed in this proceeding, the Commission should consider an alternative requirement *combining* financial qualifications with the current milestone requirement. As an initial matter, an applicant should be required to demonstrate internal funds or committed financing totaling a substantial portion, such as 25%, of the cost of construction, launch, and first-year operation. Such a threshold would be consistent with the original purpose of the rule -- measuring the ability to raise funds from financial supporters. Furthermore, such a threshold would more closely reflect the risk and investment analysis process that actually occurs in capital markets. Venture capitalists, banks, and other lenders naturally do not require businesses to have or commit all the funds necessary for a project; rather, they select businesses that have a sufficient stake in the enterprise reasonably to ensure success and invest accordingly. Ensuring that the licensees actually proceed and raise the required funding could be satisfied by the Commission's current milestones requirement. Together, these requirements would facilitate the development of global broadband systems, and provide the Commission with the ability to modify or cancel the licenses of those not proceeding with deployment.

This modified requirement would fit better with the present financial reality of the satellite industry and would allow increased competitive flexibility, thus better serving the public interest. Requiring huge amounts of funds to be tied up for the several years involved in the satellite licensing process, as proposed in the NPRM, paradoxically would inhibit the creation of the partnerships necessary to support the development and deployment of global satellite networks, and thus would militate against a competitive environment in the satellite industry. The modified standard proposed here

would better serve the Commission's goal of ensuring that licensees are able to and do use those resources to actually provide service to the public.

C. Non-Common Carrier Treatment

Hughes supports the Commission's proposal to allow Ku-band NGSO FSS systems to be licensed on a non-common carrier basis.[38] Under the Commission's current policy, satellite operators may choose to operate on a non-common carrier basis because the Commission consistently recognizes that there is no shortage of satellite capacity that would require the imposition of common carrier requirements.[39] Therefore, applying the analysis set forth in *NARUC I*, the Commission has consistently found that there is no legal obligation for fixed satellite system operators to serve the public indifferently, and has further found that the nature of fixed satellite service is not such that a provider is likely to hold itself out indifferently to serve all eligible users.[40] The situation is no different for the Ku-band fixed satellite services proposed by applicants in this proceeding. Therefore the Commission should allow applicants to elect to be licensed as non-common carriers or as common carriers.[41]

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38 See NPRM at ¶ 55.

39 See, e.g., *The Establishment Of Policies And Service Rules For The Mobile Satellite Service In The* 2 GHz Band, 15 FCC Rcd 16127 at ¶97 (2000) ("*2 MHz Order*") (determining that mobile satellite service providers in 2 GHz Band need not be regulated as common carriers).

40 See, e.g., *In The Matter Of Rulemaking To Amend Parts 1, 2, 21, And 25 Of The Commission's Rules To Redesignate The 27.5-29.5 GHz Frequency Band, To Reallocate The 29.5-30.0 GHz Frequency Band, To Establish Rules And Policies For Local Multipoint Distribution Service And For Fixed Satellite Services,* CC Docket No. 92-297, 12 FCC Rcd 22310 at ¶ 58 (1997)(deciding that operators of Ka-Band fixed satellite service may elect to operate as non common-carriers).

41 The Commission has in fact already determined in the *DISCO I Order* to treat GSO FSS Ku-band fixed satellite service operators as non-common carriers.

D. Implementation Milestones

Hughes supports the Commission's proposal to require implementation milestones for Ku-band NGSO FSS systems as it has for other satellite licenses. Implementation milestones are an effective way to ensure that licensees are building their systems in a timely manner and are not warehousing spectrum that could be used productively by other entities. However, Hughes does not support the more detailed "bending metal" and CDR interim milestones that the Commission proposes to add in the NPRM. These additional milestones are unwarranted, overly-intrusive and will be an unnecessary drain on Commission resources

The Commission's requirement that a licensee enter into a binding, non-contingent construction contract[42] already ensures that applicants will begin construction promptly upon grant and complete construction within the time frame specified in their authorization. The non-contingent contract requirement contemplates "that there will be neither significant delays between the execution of the contract and the actual commencement of construction, nor conditions precedent to construction,"[43] and thus ensures that construction will begin in a timely manner upon grant. Furthermore, to comply with the Commission's requirements, construction contracts must contain terms relating to the contractor's construction schedule, the applicant's payment schedule, and a

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42 See, e.g., *Order and Order on Reconsideration, In the Matter of Columbia Communications Corporation*, DA-01-1241 at ¶ 9 (2001) ("*Columbia Order*"); *In the Matter of PanAmSat Licensee Corp.*, 15 FCC Rcd 18720 at ¶ 8 (2000); *In the Matter of Norris Satellite Communications, Inc.* 12 FCC Rcd 22299 at ¶ 9 (1997).

43 *Memorandum Opinion and Order, in the Matter of PanAmSat Licensee Corp.*, at ¶ 16 (May 25, 2001).

binding commitment for satellite construction.[44] Such contracts require fixed construction timetables and provide for financial penalties for non-performance; they therefore provide all the necessary incentives and obligations to licensees and adequately ensure completion by the date determined by the Commission pursuant to the authorization. Timely commencement of physical construction and completion of critical design review are covered in these contracts and therefore inherent in the Commission's "construction commencement" milestone requirement.

The Commission's longstanding requirement of a construction commencement milestone as demonstrated by a non-contingent contract "enable[s] the Commission to determine early on" whether the public interest is being served by prompt deployment, or whether the spectrum is being held by a licensee unable or unwilling to proceed.[45] The current milestones requirement will provide sufficient and early information from the applicants in this processing round. As the construction requirements are already covered and the Commission already receives timely information from the construction commencement milestone, there is simply no added benefit from the additional interim showings.[46]

Besides being unnecessary, the proposed interim requirements will be intrusive and burdensome on operators, without adding assurance that the systems will be

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44 See. e.g., *Memorandum Opinion and Order in the Matter of Morning Star Satellite Company, L.L.C.*, at ¶ 5 (May 25, 2001).

45 *Id.* at ¶ 7.

46 The Commission's proposal to utilize the ITU "bringing into use" date, NPRM at ¶ 57, would not be useful. Demonstrating that an applicant has a slot on a launch manifest seven years before scheduled launch is not likely to add any assurance that implementation is proceeding in a timely fashion or that the system will be completed and launched as required.

timely deployed. These additional milestones would involve the Commission in counterproductive micro-management of licensees and require a level of detailed oversight that would hamper applicants without adding any further assurance to the Commission's oversight process. Besides imposing additional costs on applicants, these interim requirements would necessitate the disclosure of sensitive information, which could have anti-competitive effects.

Finally, such additional milestones will needlessly cost the Commission even more effort and time than in the past. The Commission notes that "enforcement of milestones has increasingly required a significant investment of limited Commission time and resources that may be better spent on other proceedings."[47] Adding the proposed interim milestones would be completely counter to the "minimalist" approach suggested in the NPRM.[48] The effort and time spent overseeing and, quite likely, litigating the interim milestones, could be well spent otherwise. The Commission will have adequate opportunity to determine whether it wishes to allocate even more resources to milestone review when it initiates its upcoming broad investigation of milestones issues.[49]

E. Reporting Requirements

Hughes supports the Commission's proposal not to require reporting of unscheduled satellite outages.[50] As the Commission notes, current spectrum resource availability make such a requirement unnecessary. The annual reporting requirements alone will sufficiently protect the public interest and promote utilization of spectrum and

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47 NPRM at ¶ 57.

48 See NPRM at ¶ 57.

49 See NPRM at ¶ 57, n. 78.

orbital resources by providing adequate information to the Commission to determine whether system development is proceeding as required.

F. International coordination

The Commission asks in the NPRM whether it should apply to Ku-band NGSO FSS licensees the policy first adopted in the Ka-band service rules proceeding regarding the Commission's coordination of the international operations of U.S. licensees.[51] The Commission's policy at Ka-band is that the Commission will "require any U.S. non-Government satellite system operating inconsistently with the U.S. 28 GHz band plan . . . to cease operations if it causes harmful interference to any U.S. non-Government system operating in conformance with the U.S. band plan . . . ."[52] In essence, this policy requires U.S. satellite licensees either to (i) conform their international operations to the U.S. band plan or (ii) bear the burden of coordinating their "non-conforming" international operations with affected U.S. licensees.

At the outset, the 28 GHz band plan differs from the Ku-band NGSO FSS band plan in that the 28 GHz band plan did not impose service limitations, such as a "gateway-only" restriction, to sub-bands within the bands allocated to a type of satellite service. Thus, Ka-band GSO FSS licensees, for example, have the flexibility, within the bands allocated for GSO FSS, to adjust their international operations in accordance with differing international spectrum plans, consistent, of course, with the general obligation

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50 See NPRM at ¶ 58.

51 NPRM at ¶ 64.

52 *In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint*

imposed upon all U.S. satellite licensees to coordinate in good faith their operations with other affected U.S. licensees. Ku-band NGSO FSS licensees will likely need that same flexibility.

Thus, to the extent that the Commission requires Ku-band NGSO FSS licensees to conform their international operations, as a default matter, to the U.S. band plan, the Commission should not impose internationally the service limitations, such as "gateway-only" operations, that are a part of the U.S. band plan. After all, the Commission imposed these service restrictions to reflect spectrum usage in the U.S. It is Hughes's experience that international spectrum use can differ significantly from the usage present in the U.S.

Furthermore, whether applying the Ka-band policy to Ku-band NGSO FSS licensees makes sense depends in good measure on licensing approach that the Commission ultimately selects for Ku-band NGSO FSS systems. An approach that relies more on band segmentation might call for one policy for international operations, while an approach that relies more on licensee-coordinated operations might call for a different policy.

Finally, the Commission should take into account that HEO systems are, as a result of their constellation architecture, focused on service to one region. For example a HEO system that is focused on North American service is unlikely to utilize spectrum for service to Asia. Thus, HEO systems that are focused only on one region should not constrain other systems from using the spectrum assigned to the HEO system in other regions.

Distribution Service and for Fixed Satellite Services, Third Report and Order, 12

V. CONCLUSION

As indicated above, there are numerous issues that will need to be studied and negotiated among the applicants for Ku-band NGSO FSS systems and the Commission in order to achieve the most efficient licensing approach for Ku-band NGSO FSS systems. Hughes suggests that the Commission assist the applicants in resolving any issues regarding the exchange of technical information and then request that the applicants engage in negotiations toward a mutually-agreeable licensing solution. Hughes looks forward to this process and an eventual negotiated solution to allow Ku-band NGSO FSS systems to develop and deploy.

Respectfully submitted,

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FCC Rcd 22310 at ¶ 71 (1997).