Before the
Federal Communications Commission
Washington DC 20554-0001

In the Matter of	]	
	]	
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 RM-9649
	]	
FWCC Petition for Rulemaking to Set Loading Standards for Earth Stations In the Fixed-Satellite Service that Share Terrestrial Spectrum	]	
	]	
Onsat Petition for Declaratory Order that Blanket Licensing Pursuant to Rule 25.115[c] is Available for Very Small Aperture Terminal Satellite Network Operations at C-Band	]	SAT-PDR-19990910-00091
	]	
Onsat Petition for Waiver of Rule 25.212d to the Extent Necessary to Permit Routine Licensing of 3.7 Meter Transmit and Receive Stations at C-Band	]	
	]	
Ex parte Letter Concerning Deployment of Geostationary Orbit FSS Earth Stations in the Shared Portion of the Ka-Band	]	

REPLY COMMENTS OF DAVID B. POPKIN

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1. David B. Popkin hereby files these Reply Comments in the above-captioned proceeding. On October 24, 2000, the Commission released the Notice of Proposed Rulemaking ["NPRM"]. In proposed Sections 25.203[e][2] and [3] and Section 101.103[d][1], the Commission states that if a licensee accepts a particular interference analysis model to coordinate its station, then it must accept the use of that same model in subsequent coordinations.

2. The proposed rule was requested by the FWCC as a result of experiences that I had as a frequency coordinator. Evaluation of the Comments filed in this Docket indicates many

misunderstandings by the commenters. To clarify the record, I will explain the purpose of the rule.

3. While the rule would have universal application in all frequency coordination activities, its main application is in instances where there is a large missed objective between the desired interference objective standards and the predicted level of interference.

4. An explanation of the frequency coordination procedures is necessary. An applicant who desires to install a new facility will conduct an evaluation of the effects of their proposal on the existing environment. This evaluation can indicate one of three possible scenarios with respect to each existing microwave facility, as follows:

a. The interaction between the proposed facility and the existing facility meets the desired interference objective. The application may be filed with the Commission.

b. The proposed facility fails to meet the desired interference objective with respect to causing interference <u>into</u> the existing facility. Since the interference affects an existing facility, this case must be resolved by the new applicant prior to the filing of its application with the Commission.

c. The proposed facility fails to meet the desired interference objective in that the proposed facility will receive interference <u>from</u> the existing facility. This is the scenario that requires clarification and explanation.

5. A receiving frequency coordinator who determines that a proposed prior coordination notification will result in a missed objective case of interference <u>from</u> its existing facility <u>into</u> the proposed facility will notify the originating frequency coordinator of this potential for interference. Since there will be no interference into the existing facility, the receiving frequency coordinator normally will not object to the applicant's application to the Commission. The applicant will make the determination as to whether the reported missed objective will be of concern.

6. The determination of whether the reported case of potential interference will result in actual interference to the applicant will be made on one or combination of the following factors:

a. There is terrain blockage between the two facilities. Features to determine terrain blockage are normally available to all frequency coordinators in the form of topographical maps or electronic data derived from these maps. There is an industry standard on the amount of blockage that may be realized from a given set of obstructions.

b. There is close-in blocking to one of the facilities such as a building or berm. Normally, the distant coordinator will not be aware of this blockage.

c. The receiving facility has conducted actual measurements to determine the level of interference.

d. The receiving facility has coordinated a block of frequencies [because they are assigned to that service and available for use] but has little or no use for the specific frequency or frequencies that the interference is limited to.

<u>e. Because the new applicant is just that, a new applicant, it may have to accept a certain level of interference because it has no choice but to "eat" the reported interference under the policy of first-come, first-served. Unless the new applicant is willing to "eat" the potential interference, it will be unable to file the application.</u>

7. The need for this rule has developed as a result of originating frequency coordinators accepting cases of interference into their proposed facility without providing any explanation as to the reason[s] which allowed the acceptance. However, once that coordination has been completed and the proposed facility is now an existing facility, it is able to require a new facility to meet the originally requested, but probably unattainable, level of interference. This results from the standard industry practice that the first station in has protection rights over the second station's proposal.

8. The following explanations will clarify how this procedure works in the example of a frequency coordination for a new, proposed IBS Ku-Band earth station. Because the rules permit operation on 10950-11200 MHz and 11450-11700 MHz, the coordination will almost always request all 500 MHz even though that entire segment will perhaps not be needed.

Assume, for purposes of explanation, the frequency coordinator desires to achieve signal levels from existing fixed microwave stations of –150 dBw or lower. Furthermore, assume that the predicted, line-of-sight, level of an existing terrestrial microwave station is –100 dBw, or 50 dB stronger than the desired level.

a. There is terrain blockage between the existing microwave station and the proposed earth station. However, utilizing the industry-accepted standards, the terrain blockage is only 30 dB. How is the missed 20 dB accounted for?

b. There is a building across the street from the proposed earth station which blocks the path between the existing microwave station and the proposed earth station. However, utilizing measurements or industry-accepted standards, the building blockage is only 25 dB. How is the missed 25 dB accounted for?

c. The existing microwave station is only operating on 11545 MHz and the proposed earth station has little or no need for reception on that frequency.

9. The problem then results when the originating earth station fails to modify either its prior coordination notification or its application to the Commission to indicate those instances where it was not able to achieve its desired level of protection. As a result, the originally requested, but unattainable, coordination data will be entered into frequency coordination databases and all new coordinators will be held to the higher, but originally unattainable, levels of protection. For example, a frequency coordinator whose newly proposed coordination for a terrestrial path on 11545 MHz which places a signal level of –130 dBw into the <u>now existing</u> earth station will have the coordination objected to because of the missed objective of 20 dB [even though the earth station had previously "eaten" 50 dB on that specific channel] compared to the desired interference protection level of –150 dBw. Because frequency coordinators will usually evaluate their proposals prior to distributing a prior coordination notice, that <u>apparent</u> 20 dB case will "force" the coordinator to unnecessarily work around and try and avoid the apparent case.

10. As noted in the comments of the FWCC on page 18, I was the frequency coordinator that experienced the instance between New Jersey Bell and AT&T. As a result of an IBS Ku-Band earth station accepting a 94 dB missed objective case and then objecting to a net 5 dB missed objective, I adopted a new policy with respect to IBS Ku-Band earth station coordinations. I would not consider the frequency coordination complete until the frequency coordinator for the IBS Ku-Band earth station provided an explanation on how each of the significantly missed

objective cases was being accepted. Furthermore, once an explanation was provided, the earth station would be required to accept any future proposals that did not exceed that level. In those instances where the earth station frequency coordinator did not provide the requested explanation, and the applicant filed an application with the Commission for the earth station [not all proposed coordination notifications resulted in applications], a Petition to Deny was filed with the Commission. Nine Petitions to Deny were filed with the Commission and nine earth station applications were modified, either by the applicant or by the Commission [such as by adding a condition to the earth station's authorization that receive protection was not granted], to provide me with the desired level of protection for future paths.

11. The criteria that I requested from earth stations in the frequency coordination process are as follows:

a. If an earth station utilized terrain blockage to meet the desired interference objective with an industry-accepted value less than the predicted missed objective, then the difference would reduce the protection level in the future for all affected frequencies. For example, in note a of paragraph 8 above, the protection level for all future paths would be changed from –150 dBw to –130 dBw on all affected frequencies.

b. If an earth station utilized local building blockage or a berm or shielding to clear a case, then that building, berm, or shield, would have a shielding value, without the need for actual measurements, for the value necessary to clear the case over all of the affected frequencies. This would apply over the entire azimuth of the blockage except for any end effect. However, if actual measurements are taken, they would supersede this [assuming that the measurements documented that the involved station was in operation at the maximum licensed power at the time of the measurement].

c. If an earth station had no explanation on how the case was being accepted, namely, it was a line-of-sight, then the desired protection level would be decreased for all cases on the affected frequencies.

d. Combinations of various explanations would exist. All reductions in the desired interference objectives would be frequency dependent. If the only interference case into the proposed earth station was on 11545 MHz, then the only reduction in desired interference objectives would apply on 11545 MHz along with the appropriate bandwidth of that station and the adjacent channel evaluation conducted in accordance with established industry standards.

12. The bottom line is that whatever interference over the desired interference level a coordinator accepts into their proposed facility, he/she must accept the same conditions in the future to the extent, and only to the extent, that they were accepted originally. No station may accept something that they are unable to achieve initially just because they had no choice [since they had to accept the interference into them to make their filing with the Commission] and then try to hold future users to those higher, unachievable levels.

13. This condition of accepting interference into a proposed coordination and then ignoring it at a later time does exist in both terrestrial and earth station coordinations. The only difference is that the cases that exist between fixed stations are usually in low single digits of decibels while the cases of interference into proposed earth stations is in tens of decibels. With fixed stations, the antennas usually are located on towers or high buildings so that the cases that are evaluated do in fact exist while the cases into an earth station are mitigated by ground clutter, buildings, berms, shielding, etc. since the earth station is usually located at ground level.

14. A number of commenters [Satellite Industry Association, et. al. at 46; Astrolink International LLC at 13-16] claim that the Commission is trying to impose a set of "accepted interference objectives" on the industry. This is not the case. The interference objectives are chosen by the originating earth station frequency coordinator. The problem develops when the originating earth station is not able to achieve the level of protection when compared to the desired level chosen by the coordinator.

15. A number of commenters [Satellite Industry Association, et. al. at 47; LMGT at 7] claim that the proposed rule would only apply for the same frequency within the same set of azimuths and elevation angles. While the azimuth and elevation angles would affect the interference level

of the terrestrial signal, it is the missed objective that is of concern rather than how that missed objective was determined.

16. A number of commenters [Satellite Industry Association, et. al. at 46; BTNA at 9] claim that there is no reason to believe that this is a significant problem and therefore has no need for resolution. The problem does exist based on my experience as a terrestrial frequency coordinator. It also must be realized that many frequency coordinators will attempt to work around any potential earth station cases in their initial evaluation rather than trying to do a manual intervention and evaluation. When this is done, the costs of engineering and implementation are increased and the earth station licensee is not aware of the effect on the terrestrial user.

17. A commenter [Satellite Industry Association, et. al. at 44] claims that it is not appropriate to require an entity that pays for a link analysis to make the information available to other operators in future coordinations. If the earth station coordinator notifies the coordination community following their coordination of any changes in desired interference objectives, and the reasons for them, that developed during the coordination process, there is no added costs involved.

18. A commenter [Satellite Industry Association, et. al. at 43] claims that a small distance between the facilities at issue can create a significant change in the impact of any terrain blockage. While that statement may be true, it is irrelevant. It is the fact that the earth station may have claimed a greater blockage value than the established industry standard that will "force" the earth station to accept a greater interference level, by a similar amount, when compared to the established industry standard value for the new path. The absolute levels of blockage by the possibly similar paths is irrelevant.

19. A number of commenters [NCTA at 4 and 6-8; GE American at 21-22] claim that this rule will force earth stations to not agree on accepting cases for a current coordination since it would bind them to accept it in the future. This is misleading since the initial acceptance occurs at the time of the initial coordination by the earth station. The interference is into the earth station and it has no choice to accept the interference if it wants to file its application. It also refers to accepting only that value of interference that exists above the predicted level of signal. Once

the earth station has been licensed, it is forced only to accepting that added level of signal that it was unable to clear at the initial coordination. Furthermore, it would not restrict the freedom of both satellite and terrestrial coordinators and operators to resolve coordination issues. Coordinators are always free to mutually agree to any condition of coordination.

20. A number of commenters [Hughes Network Systems, et. al. at 12; Loral at 11] claim that there may be changes in terrain or buildings between the time of the original coordination and the subsequent coordination. While this may be true, it is irrelevant. If a building existed at the time of the original coordination and it was utilized by the earth station to accept the potential of interference from terrestrial station A, and if that building was subsequently demolished so as not to provide protection for a new terrestrial coordination for potential interference from terrestrial station B, not only would the earth station receive interference from the potential new station B, it would now also receive greater interference from the existing terrestrial station A.

21. A number of commenters [Hughes Network Systems, et. al. at 14; Telesat Canada at 14; Loral at 11] claim that multiple exposures could increase beyond an acceptable level. The possibility on multiple exposures is already figured into the desired interference objective on a statistical basis. It is inappropriate to increase the desired interference objective and then claim that one could have a problem from multiple exposures of signals at the critical level. Furthermore, two signals with a missed objective of 50 dB would only result in a total missed objective of 53 dB and not what would appear to be 100 dB.

22. For the reasons presented, I request that the Commission adopt the proposed Rules. This is necessary to ensure that all frequency coordinations and interference resolutions may be evaluated on the basis of their own merits, sound engineering practice, and fair negotiation. This will allow all licensees and applicants to work together to make the most efficient use of the valuable radio spectrum.

Respectfully submitted,

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