BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

In re: Matters of	)	
	)	
Request for Declaratory Ruling on	)	RM-9649
Partial-Band Licensing of Earth Stations	)	
In the Fixed-Satellite Service That Share	)	
Terrestrial Spectrum	)	
	)	
Petition for Rule Making to Set	)	
Loading Standards for Earth Stations	)	
In The Fixed-Satellite Service That	)	
Share Terrestrial Spectrum	)	

To: The Commission

OPPOSITION OF THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association ("SIA")[1], pursuant to Section 1.405 of the Commission's Rules, hereby opposes the above-captioned request and petition filed on May 5, 1999 by the Fixed Wireless Communications Coalition ("FWCC"). The FWCC Request for Declaratory Ruling and Petition for Rule Making ("FWCC Petition") accurately points out that the FCC employs different spectrum assignment approaches with respect to terrestrial fixed service operators and fixed-satellite service ("FSS") earth station operators. However, it then

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[1] The SIA is a national trade association established to serve as an advocate for the U.S. commercial satellite industry on regulatory and policy issues common to its members. The SIA is an operating entity of the Satellite Broadcasting and Communications Association, and represents the leading U.S. satellite manufacturers, service providers and launch service companies in the commercial satellite arena. The executive member companies of SIA are American Mobile Satellite Corporation; Boeing Commercial Space Co.; COMSAT Corp.; Ellipso Inc.; GE American Communications Inc.; Globalstar LP; Hughes Communications Inc.; Iridium LLC; Lockheed Martin Corp.; Loral Orion Network Services Inc.; Loral Space & Communications Ltd.; Motorola, Inc.; Orbital Sciences, Corp.; PanAmSat Corp.; Teledesic Corp.; TRW Inc.; and Williams Vyvx Services. The Association is dedicated to promoting the use of satellite technology in global communications.

erroneously concludes that these differences pose an unfair burden upon fixed service licensees. The FWCC petition thus fails either to address or to challenge the fundamental underlying rationale for the FCC's licensing approach to satellite earth stations: the need for flexibility to enable successful domestic and international satellite coordinations. As elaborated more fully below, there is simply no merit to the FWCC request. Accordingly, both the declaratory ruling request and rulemaking petition portions the FWCC Petition should be rejected without further action by the Commission.

I. Introduction

The most striking aspect of the FWCC Petition is the fact that most of the text is devoted either to a background discussion of the Commission's current rules or to a delineation of the FWCC's desired changes in these rules. What is entirely lacking is any reasoned basis for change in the *status quo*. The Petition seems to suggest that a mere difference in regulatory treatment between two undeniably different and diverse services is sufficient to justify a rule change without any showing that specific characteristics of the services merit similar treatment. In fact, the Commission has, as a matter of sound policy, declined to impose common regulatory schemes on technologically distinct services.

Moreover, within the broad fixed service and FSS categories, there are a variety of types of facilities that are licensed by the Commission and coordinated in specific ways.[2] The FWCC Petition speaks only in general terms and completely ignores this diversity.[3] The

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[2] Within the FSS bands, spectrum is used not only for geostationary satellite service links, but also feeder links for mobile-satellite service and direct broadcast satellite systems. Non-geostationary FSS networks have also been proposed in some of the shared bands.

[3] For example, the FWCC includes a table that lists bands in which terrestrial fixed service and FSS share spectrum (*see* FWCC Petition at 3), but ignores the fact that the frequency

Commission has placed technical limitations on both the fixed service and FSS to ensure efficient intra-service sharing. For example, the fixed service has a traffic loading requirement, while the geostationary FSS has a two degree spacing standard. Each of these distinct technical requirements was developed taking into account the particular characteristics of the services involved, and is thus quite different in approach.

II. Long-Standing Commission Policy With Respect To FSS Spectrum Use Is Well-Grounded In The Unique Operational And Technical Characteristics of This Service.

As the FWCC implicitly acknowledges, the Commission has treated fixed service and FSS licensees differently since it began to license both of these services in shared bands more than thirty years ago.[4] The distinction is based not on arbitrary favoritism of one service over another, but on critical differences in how the two types of services are able to operate and utilize spectrum. As the Commission has stated:

> [C]oordination for the entire frequency band and visible arc is our general earth station licensing objective in order to protect our flexibility and that of the satellite operator to change satellite locations and transponder use assignments to best satisfy overall domestic satellite service requirements.

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loading requirements applicable to the fixed service are not identical in all of these bands. *See* 47 C.F.R. § 101.141(a)(3) (1998) (capacity and loading requirements applicable to only some bands cited by FWCC).

4 *See* FWCC Petition at 5 n. 12, *citing Communications Satellite Corp.*, 8 F.C.C.2d 1001, 1003 (1967) (identifying as "consistent with the practice followed in the United States" the coordination of the entire C-band uplink and downlink bands at all azimuths and elevation angles).

American Satellite Corporation, 72 F.C.C.2d 750, 754 (¶ 10) (1978)("*ASC*").[5] Just a few years later, the Commission reiterated the strong justification for its flexible approach to FSS spectrum use:

> From the beginning of the service, the Commission has recognized the high risk, large capital investment requirements and long lead times characteristic of the domestic satellite industry . . . The Commission has also recognized the inherent flexibility of [satellite] technology to respond to changing circumstances and growing user needs. This includes the capability of satellites to provide adequate service over a significant range of orbital locations. For such fixed satellites, the entire allocated frequency band is assigned at the outset to insure sufficient capacity to make it economically viable over its lifetime.[6]

Thus, the current licensing approach for satellite earth stations has a long-standing public-interest basis. Both satellite operators and the Commission itself must have sufficient operational flexibility to be able to permit a given earth station to use a variety of in-orbit spacecraft, depending on both customer requirements and transponder availability.

More specifically, as the Commission indicated in the *Domestic FSS Service Rules Order,* both operational and inherent technical characteristics of satellite facilities dictate that operators must have a great deal of latitude to modify transmission paths. Earth stations cannot be limited to a specific assigned frequency because the bandwidth available is insufficient to give each station a unique assignment within a given area. Even if this were possible, it would

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[5] In this case, the Commission cautioned the earth station applicant, which had not adhered to the practice of full band coordination, that it would "not allow restrictions on earth station frequency use resulting from limited terrestrial coordination to restrict the operational flexibility of domestic satellites." *Id. See also Public Notice on Processing Procedures for Domestic Earth Station Applications*, FCC 75-932, Attachment 2; *RCA Global Communications, Inc.*, 56 F.C.C.2d 660, 694 at n.32 (1975).

[6] *See Processing of Pending Space Station Applications in the Domestic Fixed-Satellite Service*, 93 F.C.C.2d 832, 837-38 (¶ 17) (1983) ("*Domestic FSS Service Rules Order*").

lead to very inefficient use of the in-orbit transponder capacity.[7] The potential transmission path for any satellite earth station necessarily includes any authorized space station that is within the portion of the geostationary arc that it "sees." Each station must have the ability to switch from one channel to another based on the transponder availability on the specific satellite to which it is transmitting. The earth station operator will not know in advance on which frequencies it will be able to operate because of the potential for transponder outages, satellite failures, the deployment of new satellites, and the decommissioning of aging satellites.[8] This uncertainty is especially acute given the fact that the typical earth station will have a lifetime of fifteen years or more.

Absent full band coordination, changes in satellite transponder assignments could require shifts in the frequencies transmitted and/or received by such earth stations to frequencies outside the limited band segments requested in applications, and for which no operating rights could be granted until a new coordination was completed.[9] If earth stations were restricted to operating in limited portions of the azimuth or only in limited sub-channels within a licensed band, then the Commission would lose two of its more important methods to coordinate space stations internationally: orbital reassignments and frequency use changes.[10]

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7 Under the Commission's two degree spacing policy, each satellite space station has the inherent capability to reuse all spectrum allocated to the FSS. Earth stations located in the same area operating in conjunction with geostationary satellites can transmit to the same satellite using different frequencies, and may be able to access two different satellites in different parts of the orbital arc using the same frequencies.

8 FWCC also exaggerates when it claims that "the Commission routinely licenses an earth station for the entire allocated band . . ." FWCC Petition at 3. In fact, licensing for the entire band only occurs when the applicant has demonstrated that it can coexist without causing harmful interference to existing fixed service licensees.

9 *See ASC*, 72 F.C.C.2d at 754 (¶ 10).

10 With respect to nongeostationary satellites, each earth terminal must be capable of operating over the entire allocated bandwidth so that it can switch to channels that are available on satellites in view within an NGSO constellation. This capability is critical to avoid both interference to other NGSO systems and intrasystem interference.

III. The FWCC Petition Ignores Entirely The Differences Between And Among FSS Services And Terrestrial Fixed Services.

The approach that is advocated by the FWCC in its Petition would sharply reduce the ability of earth station operators to adjust to changing requirements, and thereby undermine the utility and value of existing in-orbit geostationary spacecraft. One real-world example of the impact of such a reduction in satellite utilization would be in the area of satellite news gathering and other types of "occasional use" video. Earth stations in particular areas may be activated on an as-needed basis to cover breaking news, weather-related emergencies, political events and sports contests. By their nature, these sorts of events require use of different transponders at different times, and therefore necessitate that the uplink facilities used have the latitude to transmit on a range of frequencies. Absent the flexibility necessary to adjust service to the transponders available on satellites with the required coverage, options for transmitting video on an as needed basis would be dramatically reduced, impinging on the ability of television news organizations to provide on-the-spot coverage of breaking news events.[11]

The existing system of coordination and frequency selection has functioned well and meets the needs of microwave licensees just as the satellite coordination mechanism ensures that FSS licensees will operate efficiently. For example, satellite earth station licensees will generally seek out sites for earth stations that are sufficiently remote or shielded from areas of dense terrestrial microwave concentration to permit use of the entire allocated band. This approach benefits both the fixed service and the earth station operator because it concentrates

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[11] Although newsgathering is used here as a particularly compelling example of the need for flexibility, it is a requirement that manifests itself in different ways over the full range of satellite earth station uses, including teleports, cable head ends and VSAT networks. In each case, frequency needs change, whether through simple growth in service or the need to adapt to changes in satellites or transponder usage.

FSS ground facilities away from microwave facilities and thus permits both types of service providers to operate with less interference. Preventing earth stations that are sited in this manner from enjoying the operational flexibility that they gain from this approach would encourage earth station operators to locate facilities wherever some spectrum can be coordinated, both increasing their own costs and impinging on the ability of fixed service operators to expand in their core service areas.

Once adjacent fixed service licensees have coordinated, each can continue to utilize its initially-authorized frequencies to fulfill its function, and will need to coordinate and activate additional frequencies only if traffic grows beyond the capability of the initial frequencies to carry the load. Terrestrial microwave licensees can thus roll-out new facilities and frequencies on an as-needed basis, unlike satellite earth station operators that may need to switch among different frequencies to provide services to different customers at different times. For this reason, frequency loading requirements are practicable for terrestrial operators, but not for satellite earth stations; imposition of such a requirement must necessarily be on a frequency-by-frequency basis, and is therefore appropriate only where specific channels are assigned to licensees. Moreover, if earth station operators were required to modify their authorizations every time they desired to use additional frequencies, it would result in a torrent of modification applications that would overwhelm the FCC processing system – a result that is clearly not in the public interest.

Different regulatory treatment is also justified by the respective architectures of satellite and terrestrial networks. Terrestrial networks connect two discrete points (or sometimes more), separated by relatively short distances. By contrast, satellites can cover entire hemispheres, regardless of terrain or population density, carrying long-haul communications in a single hop, at a cost that is almost completely insensitive to the distance between the points

connected. Networks of FSS and MSS satellites may similarly provide coverage that is global in scope.

In most of the bands referenced in the FWCC Petition, terrestrial networks are poorly suited for area-wide coverage and are limited to the most densely populated areas (with the exception of users, such as railroads and the petroleum industry, which employ microwave facilities in more remote locations). Conversely, in the case of satellite networks, the same factor that enables such extensive coverage also constrains the amount of power available, and this limits the ability of satellite operators to achieve the same bits per second per Hertz that terrestrial operators achieve. It makes no more sense to apply terrestrial spectrum efficiency standards to satellite networks than to apply satellite coverage requirements to terrestrial operators. The Commission does not measure the public interest in bits per second per Hertz.[12]

With respect to FSS frequencies used for mobile-satellite service ("MSS") feeder links, the declaratory ruling and rule modifications sought by the FWCC are equally inappropriate and unnecessary. Requests for feeder link spectrum for MSS systems are generally based on the amount of service link spectrum available to the system, the number of antenna beams proposed for each satellite, and any frequency reuse techniques, *e.g.*, polarization. Thus, the requested feeder link bandwidth takes into account need, capability for frequency use, the satellite configuration, and anticipated capacity. Efficient use of the FSS spectrum is an inherent aspect of the design of economically viable satellite systems.

A reduction in MSS feeder-link spectrum for failure to meet arbitrary minimum loading requirements could substantially impair service. The use of feeder links is tied to the use

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[12] On the subject of spectrum efficiency, any valid comparison between the two services must also consider the ability of at least some satellite networks to dynamically assign spectrum where it is needed. By contrast, a terrestrial point-to-point link generally requires exclusive use of particular frequencies continuously, even when the link is not carrying any actual communications.

of service links, which are not in the FSS spectrum. Reduction in feeder link bandwidth might restrict the service capacity of the system, and thereby lead to inefficient rather than efficient use of the available spectrum resources.

IV. To The Extent Necessary, FWCC's Complaints Concerning Specific Coordination Matters Can Best Be Addressed In Industry Fora.

The FWCC also maintains that there is an inequity in current coordination procedures; an earth station operator is allowed to coordinate a new facility that would otherwise be precluded by terrestrial interference by accepting the risk that potential interference from existing fixed service stations will limit operations. The FWCC complains that an earth station facility authorized on such terms can "then block future FS users by holding them to the original objectives." FWCC Petition at 7. There is no basis for this objection, and the FWCC has provided only anecdotal evidence of disadvantage to one fixed service operator.[13]

As a general matter, an earth station operator that accepts interference at a certain frequency is taking a calculated risk that the remaining margin will still permit satisfactory operation – this is an inescapable reality of band sharing. To require an FSS earth station to accept additional harmful interference from ***new*** fixed stations would be neither practicable nor reasonable – indeed, it would preclude FSS operations in the shared band. Existing coordination standards recognize the limited downlink margins under which FSS systems operate – for the purpose of protecting terrestrial systems. Having accepted some reduction in its operating margins due to interference from existing fixed stations, an earth station should not be placed in

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[13] *See* FWCC Petition at 10 n.17. Even in this case, the Petition does not provide specifics as to either of the FCC licensees involved.

the circumstance of having its remaining ability to function chipped away incrementally by each new fixed service station that may be placed in the area.[14]

V. Conclusion

For the foregoing reasons, the SIA strongly urges the Commission to reject the FWCC's invitation to issue a declaratory ruling or initiate a rulemaking proceeding to modify the current approach to FSS earth station spectrum assignment and coordination. The regulatory changes that FWCC advocates cannot be justified and would be harmful to satellite operators and users, and to the public generally.

Respectfully submitted,

SATELLITE INDUSTRY ASSOCIATION

July 12, 1999

By: 

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[14] To the extent that there may be inconsistencies in positions taken by individual licensees in the course of coordination, SIA believes that these occurrences (which are described by the FWCC only in general terms) do not merit Commission intervention in the private coordination process. Any adjustments that may be needed in coordination procedures can be addressed in industry fora.

CERTIFICATE OF SERVICE

I hereby cetify that a copy of the foregoing Opposition of Satellite Industry Association was served by first mail, postage prepaid, this 12th day of July, 1999 to:

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