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**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

JAN 13 2006

Federal Communications Commission
Office of Secretary

In the matter of)
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Application of Mobile Satellite Ventures) File Nos. SAT-MOD-20051104-00212
Subsidiary LLC for Modification of License) SAT-MOD-20051104-00211
to Operate an Ancillary Terrestrial) SES-MOD-20051104-02556
Component)
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CONSOLIDATED OPPOSITION OF INMARSAT VENTURES LIMITED

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CONSOLIDATED OPPOSITION OF INMARSAT VENTURES LIMITED

Inmarsat Ventures Limited (“Inmarsat”) opposes the above-referenced applications of Mobile Satellite Ventures Subsidiary LLC (“MSV”) to modify its licenses to operate an ancillary terrestrial component (“ATC”) in the L-Band.

I. Introduction and Summary

In order to take advantage of the operational flexibility provided by the new ATC rules, and to obtain authority to use a number of emerging technical protocols that MSV currently is not authorized to use for ATC, MSV seeks to modify its authorizations to provide ATC over its U.S.-licensed satellites, AMSC-1 and MSV-1, and the Canadian-licensed MSAT-1.¹ As set forth below, MSV’s Modification Application cannot be granted because MSV has failed to make the demonstrations required by the new ATC rules that are designed to protect all other L-Band MSS systems from ATC-generated interference.

In its Modification Application, MSV seeks both to (i) take advantage of the relaxation of various technical limits provided by the new ATC rules, and (ii) obtain authority to use various terrestrial protocols beyond the GSM, cdma2000 and W-CDMA protocols specified

¹ *Applications of Mobile Satellite Ventures Subsidiary LLC for Modification of License to Operate an Ancillary Terrestrial Component*, File Nos. SAT-MOD-20051104-00212; SAT-MOD-20051104-00211; SES-MOD-20051104-02556 (filed Nov. 4, 2005) (collectively, the “Modification Application”).

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in MSV's current ATC authorization. Specifically, MSV seeks authority to also provide Frequency Division Duplex (FDD) and Time Division Duplex (TDD) based ATC, using Orthogonal Frequency Division Multiplexed (OFDM) and Orthogonal Frequency Division Multiple Access (OFDMA) packet data protocols, such as WiMAX.

Unfortunately, MSV has failed to make the factual showings that are preconditions to obtaining modified ATC authority to use these new technologies. Specifically, in order to ensure that MSV's ATC operations do not cause interference to other L-Band MSS systems, the new ATC rules require that MSV: (i) identify all other L-Band MSS satellites operating at orbital locations visible from any part of the United States, (ii) identify the band segments used by those satellites on which MSV wishes to provide ATC, and, most importantly, (iii) demonstrate the level of interference that MSV's MSS system is entitled to generate in each such band segment used by each such L-Band satellite (*i.e.*, the level of interference that the other MSS system has accepted as not adversely affecting its operations).

First, MSV has not even attempted to identify the L-Band satellites operating in the portions of the orbital arc that are visible from any part of the United States. Inmarsat alone has seven such spacecraft in operation in those parts of the arc.² By Inmarsat's account, there are at least ten other such satellites, operated by five entities (and using portions of the L-Band in which MSV desires to provide ATC). This demonstration is the predicate for the second required showing.

Second, MSV overstates by a factor of *more than nine times* the amount of spectrum that it uses on an "exclusive" (non-co-channel) basis. By Inmarsat's calculation, *almost all* of the L-Band spectrum that MSV claims it may use also is used by other L-Band systems at orbital

² Inmarsat intends to deorbit one of these seven satellites as soon as possible.

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locations that can “see” all or part of the United States. Thus, more than 90% of MSV’s proposed ATC spectrum is subject to rules that constrain MSV’s ATC deployment in those band segments, compared to MSV’s claim that only approximately 21% is subject to such rules. This showing, which MSV has failed to make, is the starting point for the third required showing.

Third, MSV has failed to establish the necessary interference protection criteria that apply to the “shared” portions of the L-Band that MSV seeks to use for ATC, which also are used by other MSS operators at orbital locations visible from parts of the United States. And MSV certainly has not proposed interference criteria that would adequately ensure that MSV’s ATC deployment does not cause more than the maximum level of interference permitted by the new ATC rules.

Finally, MSV has not adequately substantiated its proposed use of TDD technology. TDD technology results in a band being used in both directions, and therefore raises two new interference dynamics not addressed by the new ATC rules: (i) interference from the ATC transmitting base stations into the sidelobes of MSS satellite beams serving areas outside of the United States; and (ii) overload/intermodulation interference from the ATC mobile terminals operating in the proximity of mobile MSS earth terminal receivers in the United States. The new ATC rules permit the use of a “non-forward-band” mode of operation, such as TDD, as long as the applicant demonstrates that TDD will produce no greater potential interference than the level otherwise permitted by the ATC rules. MSV has not made that showing.

For these reasons, MSV’s ATC Modification Application cannot be granted unless and until MSV makes the required demonstrations that will ensure, under the terms of the new ATC rules, that *all other L-Band MSS systems*, including the newly-launched Inmarsat-4

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spacecraft, are protected from ATC-generated interference. Other aspects of MSV's modification request, that do not present these fundamental problems, are addressed below.

II. Application of the New ATC Rules to MSV's Modification Application

In the 2005 ATC Order, the Commission adopted a framework for authorizing ATC operations that is based on (i) the extent to which other MSS systems in certain parts of the orbital arc use the same band segments that are proposed for ATC, and (ii) the interference protection criteria that apply to MSS use of those band segments.³ Under these rules, different band segments proposed for ATC can be subject to different technical limits. Specifically, the rules provide four different categories of limits:

- Category 1: In spectrum that is "coordinated for the exclusive use of an MSS Applicant within the land area of the U.S., where there is no other L-Band MSS satellite making use of that band segment within the visible portion of the geostationary arc as seen from the ATC coverage area," the main limits on ATC deployment are the emission limitations specified in the Commission's rules.⁴
- Category 2: In band segments coordinated for shared use between the ATC applicant and another MSS operator, and where the agreement existed prior to February 10, 2005, and permits a level of interference of 6% $\Delta T/T$ or greater, ATC operations may increase system noise to the other system by up to an additional 1% $\Delta T/T$.⁵
- Category 3: In band segments coordinated for shared use between the ATC applicant and another MSS operator, and where the agreement existed prior to February 10, 2005, and permits a level of interference of less than 6% $\Delta T/T$, the Applicant's combined MSS and ATC operations may not increase system noise to the other system over 6% $\Delta T/T$.⁶

³ See *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, Memorandum Opinion and Order and Second Order on Reconsideration, 20 FCC Rcd 4616, Appendix B, § 25.253 (2005) ("2005 ATC Order"). Certain aspects of this decision are subject to Inmarsat's Petition for Reconsideration. Any modified ATC authority provided under the 2005 ATC Order should be conditioned upon the outcome of the pending Petition for Reconsideration.

⁴ 47 C.F.R. § 25.253(a)(1).

⁵ *Id.* at § 25.253(a)(3).

⁶ *Id.* at § 25.253(a)(2).

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- Category 4: In band segments in which the Applicant has no rights under a coordination agreement, the rules prohibit ATC implementation.⁷

Thus, the critical factual predicates that MSV must establish, as a condition to receiving modified ATC authority, are (i) whether there are any other L-Band MSS satellites at an orbital location visible from any part of the United States, (ii) whether there are any band segments used by those other L-Band systems in which MSV also proposes to provide ATC, and (iii) the level of interference that MSV's MSS system is entitled to generate in each such band segment used by another L-Band satellite.

MSV alleges that most of the spectrum in which it proposes to provide ATC falls into Category 1, and that there are virtually no constraints on the extent to which it can provide ATC in those band segments. MSV alleges that the remainder of its spectrum falls into Category 3, and that the relevant "ΔT/T" interference limit that constrains its ATC deployment on those bands is a 58.6% value that MSV alleges applies with respect to Inmarsat. MSV is wrong on both counts.

Right before filing this ATC Modification Application, MSV asserted, in another context, that [REDACTED].⁸ Thus, there simply is no agreement designating specific band segments for MSV's exclusive use over the land mass of the United States. In the absence of such an agreement, the five parties to the Mexico City MoU have continued to coordinate their

⁷ *Id.* at § 25.253(a)(4).

⁸ Petition of Mobile Satellite Ventures Subsidiary LLC to Hold in Abeyance or to Grant with Conditions, Stratos Communications Inc., Application for Title III Blanket License to Operate Mobile Earth Terminals with Inmarsat 4F2 at 52.75°W, File Nos. SES-LFS-20050826-01175; SES-AMD-20050922-01313; Stratos Communications, Inc. Application for Section 214 Authorization to Operate Mobile Earth Terminals with Inmarsat 4F2 at 52.75°W, FCC File No. ITC-214-20050826-00351, at 4 (filed Oct. 28, 2005) ("October 2005 MSV Petition to Hold In Abeyance") (confidential version).

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operations informally and have been operating interference-free.⁹ Because Category 1 does not apply to MSV's Modification Application in such circumstances, MSV is wrong that there are no limits on its proposed ATC operations in certain band segments.

Moreover, by Inmarsat's calculations, almost all of the L-Band spectrum that MSV claims the right to use on an "exclusive basis" actually is used by other L-Band systems at orbital locations that can "see" the United States. Thus, more than 90% of MSV's proposed ATC spectrum is subject to rules that constrain MSV's ATC deployment in those band segments.

Furthermore, Inmarsat has never agreed to accept the level of interference from MSV's co-channel operations that MSV asserts is relevant for ascertaining the limits on MSV's ATC deployment that apply to L-Band frequencies that might fall into Category 2 or 3. Nor does MSV otherwise establish that the 58.6% $\Delta T/T$ interference limit it cites is the appropriate level of co-channel interference for MSV to generate into other MSS spacecraft operating at orbital locations that are visible from the United States.

Below, Inmarsat provides background on the current state of the L-Band, and then addresses in further detail the deficiencies in MSV's showings.

A. Status of L-Band Coordination and Current MSS Operations

As a general matter, use of the L-Band by certain satellite networks of the United States, the United Kingdom, Canada, Russia and Mexico, is governed by the 1996 Mexico City Memorandum of Understanding (the "Mexico City MoU" or "1996 MoU"). The 1996 MoU does not assign specific frequencies to any L-Band operator, or any satellite network, but rather provides that frequency assignments are to be made through mutually negotiated coordination

⁹ See, e.g., *Mobile Satellite Ventures Subsidiary LLC*, DA 05-1492, at ¶ 34 (rel. May 23, 2005) ("*MSV 101° Order*"); *Mobile Satellite Ventures Subsidiary LLC*, DA 05-50, at ¶ 23 (rel. Jan. 10, 2005) ("*MSV 63.5° Order*"); *Kitcomm Satellite Communications Ltd.*, 19 FCC Rcd 6069 ¶ 9 (2004) ("*Kitcomm*").

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agreements, of limited duration, and based on actual usage and short term projections of need by each system.¹⁰ The Commission has confirmed that under the 1996 MoU, [REDACTED].¹¹ In practice, there have been four operating agreements, assigning specific frequencies to specific operators to be used in specific geographic regions, each one expiring at the end of the calendar year that it governed.

As the Commission has recognized on several occasions, the last such operating agreement expired by its own terms on December 31, 1999 and therefore is no longer effective.¹² In another context, MSV itself asserted just a few weeks before filing these very ATC Modification Applications, that [REDACTED].¹³ This is consistent with the interpretation MSV's predecessor, AMSC, had in 1999 "[REDACTED]."¹⁴ Because the 1999 Operating Agreement has expired, there is no specific assignment of L-Band frequencies to any of the L-Band systems whose spectrum rights derive from the Mexico City MoU.

The Commission has repeatedly acknowledged that while there has been no L-Band spectrum coordination agreement in existence since 1999, "the five parties have continued

¹⁰*FCC Hails Historic Agreement on International Satellite Coordination*, Report No. IN 96-16 (rel. Jun. 25, 1996) ("Spectrum allocations to individual operators will be reviewed annually on the basis of actual usage and short-term projections of future need.")

¹¹See [REDACTED].

¹²See *Comsat Corporation d/b/a Comsat Mobile Communications, et al.*, 16 FCC Rcd 21661, ¶ 6 (2001) ("No operator-to-operator agreement has been in effect since year-end 1999") ("*Comsat Order*"); *SatCom Systems, Inc.*, 14 FCC Rcd 20798, ¶ 34 (1999) ("*SatCom Order*") (recognizing that without a new operating agreement, the 1999 Agreement would expire at the end of the year; "The operator-to-operator agreement expires on December 31 each year."); see also *MSV 101° Order* at ¶ 34; *MSV 63.5° Order* at ¶ 23; *Kitcomm* at ¶ 9.

¹³October 2005 MSV Petition to Hold In Abeyance at 4 (confidential version).

¹⁴[REDACTED]; see also Letter to Magalie Roman Salas, FCC, from Lon C. Levin, Vice President and Regulatory Counsel for American Mobile (Oct. 19, 1999) (cited in *SatCom Order*, 14 FCC Rcd at n.87); see also *AMSC Subs. Corp. v. FCC*, 216 F.3d 1154, 1159-1160 (D.C. Cir. 2000) (recognizing AMSC's statement that the last coordination agreement expired on December 31, 1999).

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to coordinate their operations informally and have been operating interference-free.”¹⁵ The Commission also has recognized that all operators have equal rights to all channels in the band.¹⁶

In the case of satellite operations, the Commission has not required successful negotiation of an international coordination agreement as a prerequisite to commencing or continuing service in the L-Band.¹⁷ In the absence of a currently effective L-Band coordination agreement, the Commission has a clear policy to promote new L-Band services, provided that new operations are conducted on a non-harmful interference basis. As the Commission has recognized, L-Band operators have informally coordinated their MSS systems in the absence of a coordination agreement designating specific band segments for the use of specific operators and have operated free from harmful interference since 1999.¹⁸ Just last year, the Commission authorized MSV to operate two next-generation L-Band spacecraft whose operations had not yet been coordinated, acknowledging that no coordination agreement was in place, but simply requiring that MSV operate on a non-harmful interference basis.¹⁹

Recently, a number of Inmarsat’s distributors have filed applications seeking to utilize the recently-launched Inmarsat-4 spacecraft at 53° W.L. to both (i) support the continued provision of services that have been provided for years over the Inmarsat-3 spacecraft that has successfully co-existed with MSV since the 1999 Operating Agreement expired, and (ii) allow the provision of new and innovative MSS broadband services. Even though Inmarsat has

¹⁵MSV 101° Order at ¶ 34; MSV 63.5° Order at ¶ 23; Kitcomm at ¶ 9 (2004).

¹⁶See 2005 ATC Order at n. 91.

¹⁷See, e.g., Comsat Order; MSV 101° Order at ¶ 34; MSV 63.5° Order at ¶ 23.

¹⁸MSV 101° Order at ¶34; MSV 63.5° Order at ¶ 23.

¹⁹MSV 101° Order at ¶ 34; MSV 63.5° Order at ¶ 23; see also OuterLink, Inc., Application for a Blanket Authorization to Operate 20,000 Mobile Earth Terminals in the 1530-1559 MHz and 1638.5-1642 MHz Frequency Bands (E980203), 17 FCC Rcd 12757, ¶ 7 (2002).

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committed to operating the Inmarsat-4 spacecraft in a manner that will not adversely affect the basis under which MSV currently uses the L-Band on its MSS spacecraft, MSV has urged that the Commission not authorize Inmarsat-4 to provide service to the United States in the absence of a new coordination agreement.²⁰

B. The Last Spectrum Coordination Agreement Expired in 1999

The Commission's ATC rules expressly provide: "In a band segment in which the [ATC] Applicant has no rights under a coordination agreement, the Applicant may not implement ATC in that band."²¹ Thus, it is incumbent on MSV to demonstrate the basis on which it claims rights to use particular spectrum segments under a coordination agreement, the terms and conditions under which those rights were established, and the extent those rights still exist. MSV, however, does not even indicate the basis on which it asserts that various band segments are coordinated for its exclusive use, or its shared use.²² As noted above, the last coordination agreement that Inmarsat entered into with MSV, assigning specific band segments to specific operators, expired over six years ago.

In Inmarsat's view, the absence since December 31, 1999 of an operators' agreement under the Mexico City MoU, need not, under the Commission's ATC rules, be a barrier to MSV providing ATC. In fact, it should no more be a barrier to MSV being able to obtain an ATC authorization under the Commission's new rules than it should be a barrier to Inmarsat obtaining authority to use its new Inmarsat-4 satellite to serve the United States. However, applying the logic MSV has articulated in opposing the applications to use the

²⁰See, e.g., October 2005 MSV Petition to Hold In Abeyance at 1 (public copy; redacted).

²¹47 C.F.R. § 25.253(a)(4).

²²See *Modification Application* at 3, n. 6.

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Inmarsat-4 satellite for United States service,²³ the provisions of 47 C.F.R. § 25.253(a)(4) should lead to immediate dismissal of MSV's ATC Modification Application.

As a conceptual matter, and notwithstanding the strict terms of 47 C.F.R. § 25.253(a)(4), ATC should be allowed in the L-Band as long its provision in any given band segment does not adversely affect the L-Band MSS spacecraft that are using those same band segments, or the more advanced L-Band MSS spacecraft that are being placed into service or are expected to be launched in the near future. Thus, Inmarsat believes that the Commission can consider MSV's modification application, *but only at such time as*: (i) MSV fully addresses the extent to which Inmarsat and other MSS operators are using, on a co-channel basis, the portions of the L-Band in which MSV wishes to provide ATC, and (ii) MSV identifies objective and appropriate criteria pursuant to which co-channel protection will be afforded to all MSS systems using, at orbital locations visible from any part of the United States, any of the band segments in which MSV wishes to provide ATC.

C. Deficiencies in MSV's Showings

As noted above, to determine the ATC reuse limitations that apply to MSV, MSV must first identify (i) all other L-Band MSS satellites operating at orbital locations visible from the United States, and (ii) the band segments used by those satellites on which MSV wishes to provide ATC. Next, MSV must demonstrate the level of interference that MSV's MSS system is entitled to generate in each such band segment used by each such L-Band satellite. MSV has

²³See, e.g., October 2005 MSV Petition to Hold In Abeyance; Comments of Mobile Satellite Ventures Subsidiary LLC to Telenor Satellite, Inc. Request for Special Temporary Authority, File No. SES-STA-20051216-01756, Stratos Communications, Inc. Request for Special Temporary Authority, File No. SES-STA-20051216-01760 et al, SkyWave Mobile Communications, Corp., Request for Special Temporary Authority, File No. SES-STA-20051222-01788, Satamatics, Inc. Request for Special Temporary Authority, File No. SES-STA-20051223-01790 (filed Dec. 28, 2005).

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failed to make the requisite showings, and Inmarsat disagrees with much of the limited data that MSV has provided.

1. MSV Has Not Identified All Affected L-Band Satellites

MSV has failed to identify all L-Band satellites currently operating within the portion of the geostationary arc with a view of any part of the United States. Inmarsat alone has seven such spacecraft, one of which is planned to be deorbited as soon as possible. Nor has MSV identified the similarly situated spacecraft of other MSS operators. By Inmarsat's calculation, there are at least ten such other spacecraft operated by five operators. To Inmarsat's knowledge, each of those spacecraft uses a portion of the L-Band that MSV seeks to use for ATC.

2. MSV Has Not Identified All Co-Channel L-Band Segments

Table 1 of the Modification Application, which MSV filed on a confidential basis, lists the band segments in which MSV seeks to operate ATC and identifies such bands as either shared ("co-channel") or not shared ("non-co-channel") with other MSS satellites visible to the United States. That table appears to address only the co-channel uses being made by Inmarsat's MSS spacecraft, and it is not accurate even in that regard.

Table I-1 of Exhibit A to this Opposition, filed under the Commission's confidentiality procedures,²⁴ lists the L-Band frequencies currently used by Inmarsat on certain of its MSS systems operating in the portion of the geostationary arc with a view of the United States. Exhibit A also (i) provides information of which Inmarsat is aware about certain

²⁴Inmarsat submits Table I-1 of Exhibit A subject to a request for confidential treatment. The table contains information relating to the 1996 MoU, the spectrum currently used by each L-Band MSS provider, matters of international spectrum coordination, and other information of which the parties maintain confidentiality as a matter of course.

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similarly situated MSS spacecraft operated by other MSS providers, and (ii) identifies the inaccuracies that Inmarsat has identified in Table 1 of MSV's Modification Application.²⁵

By inaccurately reflecting co-channel uses of the L-Band by other MSS systems operating in the portion of the geostationary arc with a view of the United States, MSV overstates by a factor of *more than nine times* the amount of spectrum that it uses on an "exclusive" (non-co-channel) basis. Thus, MSV is simply wrong about many of the spectrum bands in which it claims to be entitled to unlimited ATC use under Section 25.253(a)(1) of the ATC rules.

3. MSV Has Not Shown It Will Protect All Co-Channel MSS Systems From Interference

In bands that MSV shares with other MSS systems on a co-channel basis, the ATC rules constrain MSV's ATC deployment to levels consistent with the interference limits that MSV has already coordinated to protect those other MSS systems. MSV does not identify the coordination agreements to which it is a party that allow the derivation of the 58.6% $\Delta T/T$ interference limit that MSV asserts is applicable in all frequency bands it shares with other MSS systems on a co-channel basis.²⁶ More important, Inmarsat has not agreed to accept this level of interference from MSV's co-channel operations. Similarly, MSV has failed to provide any information about the appropriate interference limits that apply with respect to the other MSS

²⁵Inmarsat's analysis is based on the assumption, consistent with the service areas of the MSV spacecraft, that ATC authority is sought in all 50 states, Puerto Rico, and the U.S. Virgin Islands.

²⁶ Other than briefly citing to certain technical parameters assumed by the Commission in its February 2003 ATC Order, MSV does not reference any coordination agreement as the basis for this value. See *Modification Application* at 3. Nor is the genesis of that value apparent from the February 2003 ATC Order. See *Flexibility for Delivery of Communications by MSS Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, Report and Order, 18 FCC Rcd 1962, Appendix C2, Table 2.1.1.C. (2003) ("February 2003 ATC Order").

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systems, operating at orbital locations that are visible from the United States, that use one or more of the band segments that MSV proposes for ATC.

Nor does MSV's proposed interference limit take into account the advanced designs of new spot beam satellites, such as Inmarsat-4 and MSV's own next-generation satellite that will be launched in as few as three years,²⁷ which use multiple small spot beams, rather than the larger area-coverage beams, and which can provide service to smaller, lighter, and less expensive MSS user terminals than ever before. These new designs, which reflect a natural evolution in spacecraft design, provide much higher power, are much more spectrally efficient, support many new and innovative MSS services, and thereby enable MSS providers to better meet the requirements of the public.

III. Other Issues

A. MSV Has Not Demonstrated That TDD-Based Operations Would Produce No More Interference Than the ATC Rules Permit

Inmarsat understands the desire of MSV to retain an option to implement an ATC system that uses a Time Division Duplex (TDD) transmission scheme. However, TDD technology results in a band being used in both directions, and therefore introduces two new interference signal paths, as noted by MSV:

- (a) Interference from the ATC transmitting base stations into the sidelobes of MSS satellite beams serving areas outside of the United States; and
- (b) Overload/intermodulation interference from the ATC mobile terminals operating in the proximity of MSS mobile earth terminal receivers in the United States.

The ATC rules allow such non-forward-band ATC uses as long as the applicant demonstrates that "the use of a non-forward-band mode of operation in such a system

²⁷ Press Release, Boeing Announces Largest Satellite Contract in Nine Years with Mobile Satellite Ventures (Jan. 11, 2006) (available at www.boeing.com/news/releases/2006/q1/060111d_nr.html).

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architecture will cause no greater interference to other MSS systems in the L-Band than the rules permit.²⁸ MSV, however, has not shown how TDD would produce no greater interference than the ATC rules permit.

First, as explained above, MSV has failed to establish the necessary interference protection criteria that apply to the “shared” portions of the L-Band which MSV seeks to use for ATC, which also are used by other MSS operators at orbital locations visible from the United States. And MSV certainly has not proposed interference criteria that would adequately ensure that MSV’s ATC deployment does not cause more than the maximum level of interference permitted by the new ATC rules. Thus, MSV has not established the requisite technical “baseline” against which the impact of a TDD scheme can be assessed.

Regarding the first interference path identified above, MSV has not accurately calculated the discrimination of the ATC base station antenna in the direction of the Inmarsat satellites. As an initial matter, MSV’s assertion that the discrimination of the ATC base station antenna in the direction of the Inmarsat satellites is 20 dB is based only on MSV measurements using the MSAT-2 satellite.²⁹ The elevation to this satellite from the test locations is approximately 38°, whereas the elevation to the various Inmarsat satellites from the ATC service area will be significantly lower than this. For example, for the Inmarsat AORE satellite at 15.5°W and the POR satellite at 178°W, the elevation angle is between 0° and approximately 15° from CONUS, and for the Inmarsat AORW satellite at 54/53°W,³⁰ the majority of CONUS sees the satellite at an elevation angle in the range 10° to 35°. This will result in less discrimination

²⁸ 2005 ATC Order at ¶ 74.

²⁹ See *Modification Application*, Technical Appendix, Supplement at 12.

³⁰ An Inmarsat-3 satellite currently located at 54° W.L. is scheduled to be replaced by an Inmarsat-4 spacecraft in late January, 2006.

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than 20 dB, due to the direct signal path to the satellite being closer to the main beam of the base station antenna, as well as greater reflection from the ground at the lower slant angles. Based on data provided by MSV in Figure 1 of its Supplement to the Technical Appendix, the sidelobe levels would be approximately 20 dB higher for 15° elevation angle, and this would impact both the direct and ground reflected signal paths. Hence, MSV's own data show that, rather than the 20 dB measured by MSV towards the higher elevation MSAT-2 satellite, there may be no discrimination at all towards the low elevation satellites.

Thus, MSV has not adequately identified the appropriate ATC base station re-use factor for MSV's TDD operation, in uplink band segments shared with Inmarsat. Because this is such a critical aspect of the TDD system design, further measurements should be taken with low elevation satellites in order to confirm the actual base station discrimination values.

Regarding the second interference path described above, MSV has not adequately addressed the increased risk of overload/intermodulation interference to Inmarsat's MSS mobile earth terminal receivers operating in the vicinity of ATC mobile terminals. Previously, when MSV was proposing only to use MSS frequencies for its ATC system co-directionally with the MSS allocation, this type of interference would have occurred only in the vicinity of fixed ATC base stations. Thus, the Commission concluded that the likelihood of an Inmarsat mobile terminal actually experiencing overload interference was not great, because the likelihood of an Inmarsat mobile terminal operating in the vicinity of an ATC base station was low.³¹ Moreover, the Commission decided to require ATC operators to notify affected MSS operators of any ATC

³¹ 2005 ATC Order at ¶ 56.

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base stations that could pose intermodulation problems, so the parties could seek a mutually acceptable solution.³²

With the introduction of TDD operation by MSV's proposed ATC system, the possible locations where such interference may occur would increase dramatically, and these "no-go" areas would constantly change as a result of the mobility of the ATC mobile terminals. And it is not clear how intermodulation problems successfully could be resolved in such a scenario. For these reasons, MSV has not met its burden to demonstrate that TDD-based ATC operations would produce no greater interference than the ATC rules permit.

B. Increased Co-Channel Reuse Based on Average ATC Terminal Gain

MSV "reserves the right," at a future date, to provide test data demonstrating that the spatially averaged gain of its ATC terminals in directions associated with co-channel satellites of other MSS operators is less than 0 dBi. MSV seeks to do this so that it may attempt to justify more intensive re-use of certain band segments for ATC.³³

Inmarsat does not object, in principle, with this concept. In such a case, however, it is important that *all* co-channel satellites of other MSS operators be accurately identified, and that such test data provide the spatially averaged gain in the direction of all such co-channel satellites. Otherwise, all satellite networks that share, on a co-channel basis, any of the band segments that MSV uses for ATC may not adequately be protected to the interference protection values specified in the ATC Rules.

For these reasons, Inmarsat urges the Commission to place any such test data that MSV may submit on public notice to allow all interested parties an opportunity to comment.

³² *Id.* at ¶ 59.

³³ *See Modification Application* at 8, Technical Appendix at 1, 2.

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MSV has not accurately identified in its application all such co-channel uses that exist today, and, absent public notice and comment, the Commission may not otherwise become aware of all such other uses.

C. Increased ATC Base Station Power

MSV seeks a waiver to allow it to deploy base stations with more than the prescribed level of antenna gain, as long as the base station EIRP does not exceed prescribed limits. In other words, MSV appears to seek flexibility to trade off lower input power into an antenna for the ability to use a higher gain antenna. Footnote 19 to MSV's Technical Appendix, however, notes that in certain areas where MSV may face difficulty acquiring ATC base station sites, the only viable solution for providing contiguous, uninterrupted ATC service in those areas may be to *increase base station EIRP* by increasing antenna gain.³⁴ Actually increasing base station EIRP in this manner does not appear to be the intent of the waiver that MSV seeks, and MSV should clarify that it is not actually seeking to increase base station EIRP. To the extent that MSV does seek authority to increase base station EIRP, by, for example, increasing the power transmitted into the base station antenna, the Commission should require MSV to make an appropriate prior technical showing to justify such higher EIRP levels. Doing so would be necessary to ensure that co-channel, as well as adjacent channel, MSS operations are adequately protected.

³⁴ *Modification Application*, Technical Annex at 10 n.19.

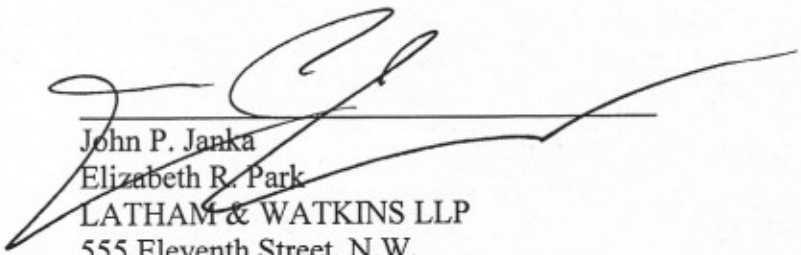
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IV. Conclusion

MSV has failed to make the demonstrations required by the new ATC rules, which are designed to protect other L-Band MSS systems from ATC-generated interference. The Commission should not grant MSV's Modification Application unless and until MSV makes the required demonstrations that will ensure that *all other L-Band MSS systems* are protected from ATC-generated interference.

Respectfully submitted,

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Counsel for Inmarsat Ventures Limited

January 13, 2006

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EXHIBIT A

Identification of Shared Bands

Table I-1 attached hereto summarizes the current uses of each band segment in the L-Band uplink frequency range by Inmarsat, MSV, and other L-Band operators authorized by the Administrations of Mexico, Russia, Japan, Australia, and Indonesia. As demonstrated by the table, MSV overstates the amount of spectrum on Table 1 of the Modification Application that is not shared on a co-channel basis with L-Band satellites operating in the geostationary arc visible to the ATC service area that MSV proposes to serve.

The L-Band uplink frequencies are shown as a series of contiguous band segments in each row of the table. The downlink frequencies used by each operator are assumed to match its uplink frequencies, except in a very small number of cases where an operator is operating only in the uplink or in the downlink direction.

The cross-hatches in the columns of the table indicate certain cases where an operator is making use of a band segment in one or more beams of its satellite network. The table includes uses by the following L-Band satellites, which are some of the L-Band satellites that are visible to the ATC service area:

Inmarsat-3 satellites: POR (178°W), AORW (54°W) and AORE (15.5°W)³⁵

MSV satellites: U.S. licensed (101°W) and Canadian licensed (106.5°W)

Mexican satellite: 113°W

Russian satellites: 170°W, 14°W, 140°E, 128°E and 145°E

Japanese satellite: MT-SAT (140°E)

Australian satellites: AUSSAT (156°E and 160°E)

Indonesian satellite: AceS (123°E)

A small number of cross-hatches with a gray shaded background indicate **[REDACTED]**.

The spectrum segments being used by MSV (both United States and Canadian networks) are categorized as "NCC" (non-co-channel) or "Shared" in the right hand columns of the table. A band segment is "Shared" if the segment is being used on a co-channel basis by MSV and another satellite visible to the ATC service area. On the other hand, a band segment is "NCC" if the segment is used by MSV and is not used by any other satellite visible to the ATC service area.

The column entitled "Actual MSV Spectrum Availability" indicates the category of the band segment used by MSV based on current operations of the L-Band operators. The column entitled "Claimed MSV Spectrum Availability" indicates the category of the band segment asserted by MSV in Table 1 of its Modification Application.

³⁵ Inmarsat-4 is being brought into service at 53° W.L. later this month.

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The amount of spectrum in each of the two categories appears as a summation at the bottom of the "Actual MSV Spectrum Availability" and "Claimed MSV Spectrum Availability" columns. According to MSV, there is [REDACTED] MHz in the "NCC" category and only [REDACTED] MHz in the "Shared" category. However, Inmarsat's analysis demonstrates that the "NCC" band segments consist of [REDACTED] MHz, and the "Shared" category consists of [REDACTED] MHz. Therefore, under the ATC rules, MSV's proposed ATC system is subject to interference limits in a much larger proportion of the spectrum than MSV indicated in its Modification Application.

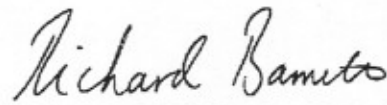
**REDACTED
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TABLE I-1

[REDACTED]

ENGINEERING INFORMATION CERTIFICATION

I hereby certify that I am the technically qualified person responsible for reviewing the engineering information contained in the foregoing submission, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this pleading, and that it is complete and accurate to the best of my knowledge and belief.



Richard J. Barnett, PhD, BSc

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Chevy Chase, Maryland 20815
(301) 656-8969

Dated: January 13, 2006

CERTIFICATE OF SERVICE

I, Olivia D. Freeman, hereby certify that on this 13th day of January 2006, served a true copy of the foregoing Consolidated Opposition of Inmarsat Ventures Limited by first class mail, postage pre-paid (or as otherwise indicated) upon the following:

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A handwritten signature in cursive script that reads "Olivia D. Freeman". The signature is written in black ink and is positioned above a horizontal line.

Olivia D. Freeman

*by E-mail