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January 26, 2006

Via Hand Delivery
Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

**Re: Response of Mobile Satellites Ventures Subsidiary LLC to
Opposition of Inmarsat Ventures Ltd.
File No. SAT-MOD-20051104-00212
File No. SAT-MOD-20051104-00211
File No. SES-MOD-20051110-01561
File No. SES-MOD-20051104-02556**

Dear Ms. Dortch:

Mobile Satellites Ventures Subsidiary LLC (“MSV”) hereby files this redacted public version of a Response to the Opposition of Inmarsat Ventures Ltd. (“Inmarsat”) to MSV’s application to modify its license to operate an Ancillary Terrestrial Component (“ATC”) in the L band.¹ As discussed herein, certain information provided in the attached Petition should be treated as confidential.²

47 C.F.R. § 0.459(b)(1) -- Identification of the specific information for which confidential treatment is sought

MSV requests confidential treatment of information relating to the *Mexico City Memorandum of Understanding* and the on-going international L band frequency coordination process which is confidential to the parties to that coordination, which includes the Commission and MSV.³ When considering other applications to use Inmarsat satellites in the United States,

¹ See MSV, Application, File Nos. SAT-MOD-20051104-00212, SAT-MOD-20051104-00211, SES-MOD-20051110-01561 (November 4, 2005) (“*MSV ATC Modification Application*”).

² 47 C.F.R. § 0.459(b).

³ See *Memorandum of Understanding for the Intersystem Coordination of Certain Geostationary Mobile Satellite Systems Operating in the Bands 1525-1544/1545-1559 MHz and 1626.5-1646.5/1646.5-1660.5 MHz*, Mexico City, Mexico, 18 June 1996.

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the Commission has acknowledged the confidentiality of this information and has afforded it confidential treatment.⁴

47 C.F.R. § 0.459(b)(2) -- Identification of the Commission proceeding in which the information was submitted or a description of the circumstances giving rise to the submission

This information is being filed in MSV's Response to Inmarsat's Opposition to MSV's application to modify its license to operate an Ancillary Terrestrial Component ("ATC") in the L band.

47 C.F.R. § 0.459(b)(3) -- Explanation of the degree to which the information is commercial or financial, or contains a trade secret or is privileged

As the Commission has acknowledged, the *Mexico City Memorandum of Understanding* and related coordination documents are confidential.⁵

47 C.F.R. § 0.459(b)(4) -- Explanation of the degree to which the information concerns a service that is subject to competition

The information contained herein concerns the market for wireless services, in which MSV faces competition from other MSS providers as well as from terrestrial wireless operators.

47 C.F.R. § 0.459(b)(5) -- Explanation of how disclosure of the information could result in substantial competitive harm

Disclosure of the information for which confidential treatment is sought would result in violation of the *Mexico City Memorandum of Understanding*.

⁴ See *COMSAT Corporation et. al., Memorandum Opinion, Order and Authorization*, 16 FCC Rcd 21661, ¶¶ 111 (2001) ("*COMSAT Order*") ("The Mexico City Agreement and related coordination documents, such as minutes of coordination meetings, are considered confidential.").

⁵ *Id.*

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- 47 C.F.R. § 0.459(b)(6) -- Identification of any measures taken by the submitting party to prevent unauthorized disclosure**

Disclosure to third parties of the information for which confidential treatment is sought has been strictly pursuant to non-disclosure agreements.

- 47 C.F.R. § 0.459(b)(7) -- Identification of whether the information is available to the public and the extent of any previous disclosure of the information to third parties**

The information for which confidential treatment is sought is not publicly available. Disclosure to third parties of the information for which confidential treatment is sought has been strictly pursuant to non-disclosure agreements.

- 47 C.F.R. § 0.459(b)(8) -- Justification of the period during which the submitting party asserts that material should not be available for public disclosure**

The information for which confidential treatment is sought should remain confidential indefinitely or until the parties to the *Mexico City Memorandum of Understanding* agree that it can be made publicly available.

- 47 C.F.R. § 0.459(b)(9) -- Any other information that the party seeking confidential treatment believes may be useful in assessing whether its request for confidentiality should be granted**

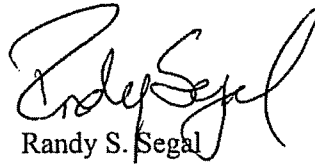
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Please contact the undersigned with any questions.

Very truly yours,



Randy S. Segal

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**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the matter of)	
)	
Mobile Satellite Ventures Subsidiary LLC)	File No. SAT-MOD-20051104-00212
)	File No. SAT-MOD-20051104-00211
Application for Modification of License to)	File No. SES-MOD-20051110-01561
Operate an Ancillary Terrestrial Component)	File No. SES-MOD-20051104-02556

**RESPONSE OF MOBILE SATELLITE VENTURES SUBSIDIARY LLC TO
OPPOSITION OF INMARSAT VENTURES LIMITED**

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Summary

MSV urges the Bureau to reject Inmarsat's Petition to Deny and to promptly grant MSV's proposal for a modified Ancillary Terrestrial Component so that the company can continue its efforts to bring the benefits of an integrated satellite and terrestrial system to the American public. Inmarsat's Petition raises a relatively narrow set of concerns regarding potential interference, limited to the terms of the existing coordination agreement and to Time Division Duplex operations. In both cases, the evidence demonstrates that MSV will operate within the limits established by the rules.

MSV's demonstration of the extent to which the MSS L band spectrum is shared among the North American system operators is based, as the rules require, on the most recent coordination agreement, which the Commission has repeatedly confirmed continues to govern spectrum rights and assignments in the L band. This agreement covers frequencies that are used exclusively by a given operator and frequencies which, within the region but over different geographic areas, are shared between operators. Inmarsat's challenge notwithstanding, MSV has accurately described which frequencies are shared and which are not shared. With respect to those frequencies that MSV or MSV Canada shares with Inmarsat, MSV also has accurately identified the interference thresholds to which the operators have agreed. The Commission used the same threshold in the *2003 ATC Order*, a finding that Inmarsat did not challenge.

As for MSV's proposed operations of ATC in TDD mode, MSV has conservatively estimated the amount of base station antenna discrimination towards co-channel L band satellites, including those at low elevation angles, thus demonstrating that its TDD-mode base stations will not interfere with Inmarsat's L band satellites. MSV's TDD-mode ATC terminals also will not interfere with L band satellite earth stations, primarily because satellite earth

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stations are not used in urban areas, but also because ATC user terminals radiate only one carrier, transmit far less power than base stations, and have a duty factor of at most one-half.

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**Before the
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) File No. SAT-MOD-20051104-00211
Application for Modification of License to) File No. SES-MOD-20051110-01561¹
Operate an Ancillary Terrestrial Component) File No. SES-MOD-20051104-02556¹

**RESPONSE OF MOBILE SATELLITE VENTURES SUBSIDIARY LLC TO
OPPOSITION OF INMARSAT VENTURES LIMITED**

Mobile Satellite Ventures Subsidiary LLC (“MSV”) hereby files this Response to the Opposition of Inmarsat Ventures Limited (“Inmarsat”) to MSV’s application to modify its license to operate an Ancillary Terrestrial Component (“ATC”) in the L band.² As discussed herein, MSV has demonstrated that its modified ATC network will produce no more interference to other L band MSS systems than the rules permit. Accordingly, MSV urges the International Bureau (“Bureau”) to promptly grant this application so that MSV may proceed to bring the benefits of its integrated satellite-terrestrial network to the American public.

Background

In February 2003, the Commission issued an order deciding that it is in the public interest to permit Mobile Satellite Service (“MSS”) operators to provide ancillary terrestrial service.³ On November 8, 2004, the Bureau granted MSV’s application to operate an ATC in the L band

¹ The Bureau initially assigned the file number SES-MOD-20051104-02556 to one of MSV’s applications but later changed this file number to SES-MOD-20051110-0156. MSV is filing this Response in both files out of an abundance of caution.

² See Inmarsat Ventures Limited, Opposition, File Nos. SAT-MOD-20051104-00212, SAT-MOD-20051104-00211, SES-MOD-20051104-02556 (January 13, 2006) (“*Inmarsat Opposition*”).

³ See *Flexibility for Delivery of Communications by MSS Providers, Report and Order*, IB Docket No. 01-185, 18 FCC Rcd 1962 (February 10, 2003) (“*ATC Order*”).

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using spectrum coordinated for both MSV and Mobile Satellite Ventures (Canada) Inc. (“MSV Canada”), the Canadian L band MSS licensee.⁴ In its decision, the Bureau granted some of MSV’s variance and waiver requests with restrictions and deferred the other requests to the proceeding considering Petitions for Reconsideration of the 2003 *ATC Order*.

On February 25, 2005, the Commission released a decision revising its technical rules for operation of ATC in the L band.⁵ The new rules provide significant additional flexibility for L band MSS operators to reuse their coordinated spectrum for ATC, including permitting operation of ATC in Time Division Duplex (“TDD”) mode.⁶ On November 4, 2005, MSV filed the above-captioned applications to modify its ATC license to reflect these new rules.⁷

The new rules recognize two general types of L band frequencies an L band operator may use over its ATC coverage area: (i) those that have been coordinated for the exclusive use of the operator and (ii) those that are shared co-channel with other L band operators. Spectrum in the L band in North America is shared primarily among five operators: MSV, MSV Canada, Inmarsat, and Mexican and Russian systems.⁸ The five Administrations that license these systems reached an agreement in 1996 for a framework for future coordination of the L band spectrum in North America, called the Mexico City Memorandum of Understanding (“*Mexico*

⁴ See *Mobile Satellite Ventures Subsidiary LLC, Order and Authorization*, DA 04-3553 (Chief, International Bureau, November 8, 2004) (“*MSV ATC Decision*”).

⁵ See *Flexibility for Delivery of Communications by Mobile Satellite Service Providers, Order on Reconsideration*, IB Docket No. 01-185, FCC 05-30 (February 25, 2005) (“*ATC Recon Order*”).

⁶ See *ATC Recon Order* ¶¶ 37-51 (authorizing additional uplink flexibility); *id.* ¶¶ 53-65 (authorizing additional downlink flexibility); *id.* ¶ 74 (authorizing TDD); see also 47 C.F.R. § 25.253(a) (codifying additional uplink flexibility); 47 C.F.R. § 25.253(d), (e) (codifying additional downlink flexibility); Note to § 25.149(a)(1) (codifying TDD for L band MSS).

⁷ See MSV, Application, File Nos. SAT-MOD-20051104-00212, SAT-MOD-20051104-00211, SES-MOD-20051110-01561 (November 4, 2005) (“*MSV ATC Modification Application*”).

⁸ The L band spectrum in North America is also shared with Japan’s MTSAT satellite, but only in and near the Pacific Ocean.

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City MoU)⁹ Under the *Mexico City MoU*, the L band operators are each assigned certain specific frequencies to use on their specific satellites through multi-party operator agreements, called Spectrum Sharing Arrangements (“SSA”). While a new SSA has not been negotiated since 1999, the Commission has required L band operators to comply with the 1999 SSA and has repeatedly confirmed that the 1999 SSA continues to effectively govern L band operations. See Exhibits A and B.

With respect to those frequencies coordinated for the exclusive use of an L band operator over its ATC coverage area, the rules adopted in the *ATC Recon Order* permit unlimited terrestrial reuse for ATC. 47 C.F.R. § 25.253(a)(1). Table 1 of the *MSV ATC Modification Application* identifies those L band frequencies that have been coordinated exclusively for MSV and MSV Canada. For those L band frequencies that are shared co-channel and for which a coordination agreement that existed prior to February 10, 2005 permits a level of interference to other MSS systems of 6% $\Delta T/T$ or greater, the Commission’s rules permit ATC to increase the noise level of the other MSS systems by no more than an additional 1% $\Delta T/T$. 47 C.F.R. 25.253(a)(3). In its application, MSV explained that, other than those frequencies coordinated for the exclusive use of MSV and MSV Canada over MSV’s ATC coverage area, the remaining frequencies coordinated for MSV and MSV Canada are shared co-channel only with Inmarsat-3 satellites and at an agreed level of inter-system interference of 58.6% $\Delta T/T$. See *MSV ATC Modification Application* at 3. Table 2 of MSV’s application identified the amount of reuse on shared frequencies by an ATC for each of several candidate protocols without exceeding this 1% $\Delta T/T$ allotment.

⁹ See *Memorandum of Understanding for the Intersystem Coordination of Certain Geostationary Mobile Satellite Systems Operating in the Bands 1525-1544/1545-1559 MHz and 1626.5-1646.5/1646.5-1660.5 MHz*, Mexico City, Mexico, 18 June 1996 (“*Mexico City MoU*”).

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In addition to identifying the existing sharing environment in the L band, MSV's ATC modification application requested authority to deploy Frequency Division Duplex (FDD) and TDD-based ATC using Orthogonal Frequency Division Multiplexed (OFDM) and Orthogonal Frequency Division Multiple Access (OFDMA) packet data protocols (e.g., WiMAX). MSV also requested that the Bureau affirm the grant of certain waivers from the November 2004 *MSV ATC Decision*¹⁰ and also adopt the following additional waivers or clarifications: (i) a waiver of Section 25.253(d)(8) to deploy base stations with more than 16 dBi of antenna gain;¹¹ (ii) the flexibility to deploy ATC base station antennas with less than five degrees of down-tilt;¹² and (iii) a waiver of Section 25.253(g)(1) to deploy user devices with a peak EIRP limit exceeding 0 dBW.¹³ On January 13, 2006, Inmarsat filed an Opposition to MSV's application claiming that MSV has not made the demonstrations required by the Commission's rules with respect to potential interference to other L band operators. *See Inmarsat Opposition.*

¹⁰ MSV requested that the Bureau make clear that MSV is still permitted to operate pursuant to the following previously-granted waivers: (i) authority to deploy ATC capable of supporting CDMA and GSM air interface protocols (*MSV ATC Decision* at ¶¶ 85-91, 95(i)); (ii) authority to use a link-margin booster in conjunction with ATC terminals used with current generation satellites (*id.* at ¶¶ 19-21, 95(g)-(h)); (iii) authority to initiate ATC services without constructing a new satellite of the same design as the current generation in-orbit satellites (*id.* at ¶¶ 22-25); and (iv) authority to increase co-channel reuse to the extent MSV submits test data demonstrating that the spatially-averaged antenna gain of its ATC terminals is less than 0 dBi in the direction of co-channel satellites (*id.* at ¶¶ 52-56, 95(f)). *See MSV ATC Modification Application* at 7-8.

¹¹ Inmarsat does not object to this request, but it does express concern that MSV not be permitted to use an authorized increase in antenna gain to increase base station EIRP. *Inmarsat Opposition* at 17-18. As MSV expressly stated in its application, however, it does not seek to increase base station EIRP. *See MSV ATC Modification Application* at 8.

¹² Inmarsat does not object to this request.

¹³ Inmarsat does not object to this request.

Discussion

I. MSV HAS ACCURATELY CHARACTERIZED THE EXTENT TO WHICH L BAND SPECTRUM IS SHARED

Inmarsat claims that MSV has mischaracterized the sharing environment in the L band by allegedly (i) failing to cite an effective coordination agreement that provides MSV and MSV Canada with exclusive use of any L band frequencies (*Inmarsat Opposition* at 6-10); (ii) understating the extent to which Inmarsat shares L band frequencies (*id.* at 11-12 and Exhibit A); (iii) failing to identify L band satellites other than the three Inmarsat-3 satellites that share frequencies with MSV and MSV Canada (*id.* at 11); and (iv) failing to provide support for Inmarsat's acceptance of an inter-system interference limit of 58.6% $\Delta T/T$ for frequencies it shares with MSV and MSV Canada (*id.* at 12-13). As discussed below, Inmarsat is wrong on all points because MSV has accurately identified the L band frequencies that are coordinated for the exclusive use of MSV and MSV Canada as well as the coordinated interference limit for frequencies they share.

Pursuant to the 1999 SSA, certain L band frequencies are shared with other L band operators and certain frequencies are coordinated for the exclusive use of an L band operator. Table 1 of MSV's application lists these frequencies for MSV and MSV Canada. While a new SSA has not been negotiated since 1999, the Commission has required L band operators to continue to comply with the 1999 SSA.¹⁴ **REDACTED**

¹⁴ As detailed in Exhibit A, the Commission has authorized earth stations to use a coordinated L band satellite subject to the condition that operations would be limited to those portions of the L Band "coordinated for the [applicable L band satellite] in the most recent annual L-Band operator-to-operator agreement," which refers to the 1999 SSA. *See* Exhibit A. The Commission has continued to impose this condition well after 1999, with full knowledge that the L band operators have not negotiated a new SSA since that time.

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Inmarsat's own actions since 1999 also confirm that L band operators were required to abide by the spectrum assignments in the 1999 SSA.¹⁶ Moreover, the Commission has repeatedly confirmed that although a new SSA has not been negotiated since 1999, it continues to effectively govern the spectrum assignments of L band MSS providers.¹⁷ In the 2005 *ATC Recon Order*, the Commission held that the 1999 SSA is the coordination agreement that contains the rights of L band operators to their spectrum assignments for purposes of demonstrating compliance with the ATC rules, referring to the 1999 SSA as the "existing agreement" and noting that, while "ideally" the L band operators would renegotiate a coordination agreement every year, this has proven infeasible. *ATC Recon Order* ¶ 44 and nn.110, 114. Inmarsat never asked the Commission to reconsider this finding.

¹⁵ REDACTED

¹⁶ REDACTED

, as is the statement it made in its April 2005 securities filing that "the amount of spectrum available to each operator is currently frozen at the levels agreed in 1999." See Inmarsat Global Ltd., Form F-20 (April 29, 2005), at 10 ("*Inmarsat April 2005 Form F-20*") (available at: <http://www.sec.gov/Archives/edgar/data/1291396/000104746905012474/a2156552z20-f.htm>).

¹⁷ See Exhibit B. Despite Inmarsat's claim, MSV's ATC application is unlike the pending applications to use the uncoordinated Inmarsat 4F2 satellite in the United States. See *Inmarsat Opposition* at 10; see also, e.g., MSV, Petition, File No. SES-LFS-20051123-01634 (January 13, 2006). In the case of Inmarsat 4F2, Inmarsat is proposing to operate an uncoordinated satellite that is not contemplated by the *Mexico City MoU*, the 1999 SSA, or any other coordination agreement. Inmarsat 4F2 is simply a rogue satellite with no internationally recognized rights. Moreover, in that proceeding, Inmarsat is claiming to have the right to operate on every L band frequency, to include frequencies that have been coordinated for MSV and MSV Canada under the 1999 SSA. In such a case, harmful interference is inevitable, and a prior coordination agreement is essential to avoid this interference. Conversely, MSV is proposing here, until there is a new coordination agreement, to use for ATC only those L band frequencies coordinated for MSV and MSV Canada under the 1999 SSA, consistent with the Commission's rules.

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MSV has accurately identified the band segments that MSV and MSV Canada have coordinated for their exclusive use under the 1999 SSA over MSV's ATC coverage area. While Inmarsat provides its own assessment of the status of sharing in the L band, its claims regarding the extent to which it has the right to share spectrum over MSV's ATC coverage area are overstated and completely inconsistent with the 1999 SSA. *See Inmarsat Opposition* at Exhibit A. For example, Inmarsat considers frequencies that were loaned by MSV or MSV Canada to Inmarsat, but subsequently recalled by the lenders, as frequencies coordinated for Inmarsat's either exclusive or shared use. In fact, as MSV demonstrated in Table 1 of its application, these frequencies should properly be considered as coordinated for either the exclusive or shared use of MSV and MSV Canada.¹⁸ Inmarsat also considers additional frequencies that have been coordinated for MSV and MSV Canada, but that Inmarsat asked MSV and MSV Canada to use in 2003, as frequencies coordinated for Inmarsat's either shared or exclusive use. In fact, MSV and MSV Canada rejected these requests. Accordingly, consistent with the 1999 SSA, these frequencies should properly be considered as frequencies coordinated for either the exclusive or shared use of MSV and MSV Canada.

MSV has also accurately identified no coordinated L band satellites, other than the three Inmarsat-3 satellites, that are visible from MSV's ATC coverage area and which share frequencies with MSV or MSV Canada.¹⁹ While Inmarsat claims to operate seven satellites over

¹⁸ The Bureau has taken action towards terminating Inmarsat's illegal use of loaned-but-recalled frequencies. *See STA Grant*, File No. SES-STA-20051222-01788 (January 18, 2006), at ¶ 5.

¹⁹ For this reason, there is no need for MSV to specify a coordinated inter-system interference limit for frequencies shared with L band satellites other than Inmarsat-3 satellites. *Inmarsat Opposition* at 13. Moreover, because MSV has already identified all of the co-channel satellites of L band MSS operators that could be impacted by its ATC, there is no cause for the Bureau to place on *Public Notice* any test data MSV may submit in the future to increase co-channel reuse based on a demonstration that the spatially-averaged antenna gain of its ATC terminals is less than 0 dBi in the direction of co-channel satellites. *See Inmarsat Opposition* at 16-17.

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MSV's ATC coverage area, only the three Inmarsat-3 satellites have been coordinated among the North American L band operators. Accordingly, only these three satellites are entitled to protection under the Commission's ATC rules. In addition, while Inmarsat contends that MSV has not considered the impact of ATC on advanced satellites such as the Inmarsat-4 satellites, Inmarsat has failed to coordinate these satellites with other L band operators. In any event, as MSV explained in its application, it expects to be able to operate ATC without any increase in interference to the Inmarsat-4 satellites. *See MSV ATC Modification Application* at 3 n.7. Inmarsat also claims that a Russian system shares spectrum with MSV over MSV's ATC coverage area. In fact, as specified in the 1999 SSA, MSV and the Russian system have exclusive rights to certain L band frequencies in either the downlink only or uplink only direction. MSV operates consistent with this restriction and is confident that its ATC operations will not result in an increase in interference to the Russian system. Inmarsat also refers to Region 1 and 3 satellites as operating co-channel with MSV, but these satellites are barely visible to MSV's ATC coverage area near the coast of the continental U.S. and are otherwise only visible from Alaska and Hawaii, meaning that operation of MSV's ATC in the United States will have at most a negligible impact. Accordingly, those frequencies that are shared by Region 1 and 3 operators should be considered as coordinated for the exclusive use of MSV and MSV Canada over MSV's ATC coverage area.

With respect to frequencies that MSV and MSV Canada share with Inmarsat over Region 2, MSV has accurately identified the inter-system interference limit of 58.6% $\Delta T/T$ that Inmarsat has accepted in the course of multilateral coordination. While Inmarsat claims that it has not accepted this limit, the Commission in the *2003 ATC Order* demonstrated otherwise. *ATC*

Order, Appendix C2, Table 2.1.1.C.²⁰ The parameters for the MSV terminals used in the Commission's analysis are the very same parameters used for the MSV terminals in the multilateral coordination. The technical analyses in the multilateral coordination were based on C/I calculations, but the same mobile terminal parameters will produce the same noise increase level to the same satellite receiver whether the analysis is based on a $\Delta T/T$ or a C/I calculation methodology. Inmarsat agreed to these terminal parameters in the multilateral coordination analyses, and it cannot disclaim them now. In fact, Inmarsat never sought reconsideration of the Commission's finding in the *2003 ATC Order*. Accordingly, the Commission's previous calculations are an accurate representation of the interference environment that was considered during the multilateral coordination, which includes Inmarsat's acceptance of an inter-system interference limit of 58.6% $\Delta T/T$ from MSV's terminals operating co-channel with Inmarsat satellites.

II. TDD-BASED ATC OPERATIONS WILL PRODUCE NO MORE INTERFERENCE THAN THE ATC RULES PERMIT

In the *ATC Recon Order*, the Commission permitted L band operators to implement ATC using TDD protocols provided such operations produced no more interference than the rules permit. *ATC Recon Order* ¶ 74. While MSV made such a showing in its application, Inmarsat objects on two grounds, claiming that its satellites and mobile earth terminals ("METs") will be subject to greater interference. *Inmarsat Opposition* at 14-16.

With respect to Inmarsat's satellites, as MSV demonstrated in its application, TDD-mode ATC base stations transmitting on frequencies in the 1.6 GHz band will not interfere with Inmarsat satellites receiving on the same frequencies. As discussed above in Section I, MSV has

²⁰ As the Commission notes in the *ATC Recon Order*, even though "the existing coordination agreement does not specify current $\Delta T/T$ protection levels [], such levels can be calculated using either ITU-R Appendix 8 (Rev. WRC-03) or the methodology that was presented in" the *ATC Order*. *ATC Recon Order* n.144

identified the frequencies Inmarsat shares with MSV and MSV Canada as well as the inter-system interference limit Inmarsat has agreed to accept for those frequencies. Thus, despite Inmarsat's claims, MSV has not misstated the interference protection criteria used to calculate its permitted reuse in TDD mode in shared portions of the L band. *Inmarsat Opposition* at 14. Moreover, as discussed in the attached Technical Appendix, MSV has conservatively estimated at 20 dB the amount of base station antenna discrimination towards L band satellites, including those at low elevation angles. Accordingly, there is no basis for Inmarsat's claim that its low elevation satellites will be impacted by MSV's TDD-mode base station operations.

With respect to Inmarsat's METs, TDD-mode ATC terminals transmitting in the 1.5 GHz band will not interfere with Inmarsat METs receiving in the same band. *Inmarsat Opposition* at 16. Inmarsat's claims of potential interference are completely unsupported and speculative.²¹ The Commission has already found that (i) Inmarsat METs are not likely to be used in urban areas where MSV's ATC terminals will operate²² (*ATC Recon Order* ¶ 56); (ii) Inmarsat METs are less susceptible to interference than Inmarsat has claimed and the Commission had previously assumed (*id.* ¶ 55); (iii) Inmarsat should be deploying satellite METs that are more resistant to interference (*id.*); and (iv) coordination of contiguous frequency assignments will allow for effective front-end filtering that will make the METs even more resistant to interference (*id.* ¶ 59). Inmarsat has never refuted any of these Commission findings. Inmarsat has also indicated that it plans to deploy ATC, which will further reduce the likelihood that an

²¹ The Commission has held that it will not refrain from authorizing new services based on speculative and unsubstantiated claims of potential interference. See *Revision of Part 15 of the Commission's Rules, Memorandum Opinion and Order and Further Notice of Proposed Rule Making*, 18 FCC Rcd 3857, FCC 03-33 (March 12, 2003), at ¶ 135.

²² MSV notes that this application requests authority for TDD only for ATC operations. This application does not seek authority to operate satellite-only terminals or ATC terminals in satellite mode using a TDD protocol.

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Inmarsat customer in a densely-populated area will be adversely affected by MSV's ATC TDD terminals.²³ While Inmarsat attempts to draw an analogy to interference that might be caused by MSV's ATC base stations, this is an inappropriate analogy. *Inmarsat Opposition* at 16. As discussed in the attached Technical Appendix, unlike base stations, ATC terminals operating in TDD mode (i) radiate only one carrier compared to multiple carriers radiated by base stations; (ii) transmit far less power than base stations; and (iii) have a duty factor of at most one-half (*i.e.*, the terminal is transmitting no more than half of the time it is involved in communicating). *See* Technical Appendix. All of these factors make overload and intermodulation interference far less likely with ATC terminals than with ATC base stations.

Conclusion

MSV urges the Bureau to promptly grant this application so that MSV may proceed to bring the benefits of its integrated satellite-terrestrial network to the American public.

Respectfully submitted,



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Dated: January 26, 2006

²³ *See Press Release, Inmarsat to Seek ATC Licence* (February 15, 2005) (available at: <http://about.inmarsat.com/news/00015672.aspx?language=EN&textonly=False>).

Technical Appendix

I. Impact of TDD-Mode ATC Base Stations Transmitting in the 1.6 GHz Band on Low-Elevation Satellites Receiving in the 1.6 GHz Band

In its application, MSV provided evidence that the discrimination of an ATC base station antenna in the direction of an Inmarsat satellite can be conservatively estimated at 20 dB. See *MSV ATC Modification Application*, Technical Appendix at 6 and Supplement. This was based on measurements MSV performed to characterize the RF isolation between several L band base station antennas and its MSAT-2 satellite at 101° W. See *id.* In its Opposition, Inmarsat claims that this level of antenna discrimination is overstated with respect to Inmarsat satellites because the elevation angle to the MSAT-2 satellite was approximately 38° whereas the elevation angle to various Inmarsat satellites is much lower. See *Inmarsat Opposition* at 15. As discussed herein, MSV has conservatively estimated at 20 dB the amount of base station antenna discrimination towards L band satellites, including those at low elevation angles

Inmarsat's AORE (15.5° W) satellite views the coastal areas of the Eastern United States, with an elevation angle of approximately 15°. As such, an ATC base station antenna that is deployed in a coastal area of the Eastern United States will provide discrimination to the AORE satellite of at least 27 dB. This is a result of the Commission's rules which require MSV to use ATC base stations with an overhead gain suppression of 27 dB over elevation angles from 15° to 55°. See 47 C.F.R. § 25.253(e).

For areas further inland, the elevation angle between an ATC base station and the AORE satellite may be less than 15° and the discrimination provided by the ATC base station antenna in the direction of the AORE satellite may be less than 27 dB. However, as the elevation angle becomes smaller, the amount of signal blockage increases rapidly, as the Commission recognized in the 2003 *ATC Order*. See *ATC Order*, Appendix C2, Section 1.2.2. In the 2003 *ATC Order*, the Commission found the Expected Average Outdoor Blockage for the AORE satellite to be 17.5 dB, while the Expected Average Outdoor Blockage for the AORW (54° W) satellite was found to be only 3.1 dB. See *ATC Order*, Appendix C2, Table 1.2.3.B. Thus, relative to the AORW satellite, the AORE satellite is afforded 14.4 dB of additional average outdoor blockage protection. Taking into account (i) the additional signal loss due to the larger slant range associated with the AORE satellite (1 dB); (ii) the fact that the AORE satellite sees less than half of MSV's ATC coverage area (3 dB); and (iii) the average ATC base station antenna discrimination in the direction of the AORE satellite (which is conservatively estimated at 3 dB since a larger concentration of ATC will exist in coastal areas where the elevation angle between ATC base stations and the AORE satellite will be at a maximum of 15°), the average discrimination between the ensemble of MSV's ATC base stations and Inmarsat's AORE satellite becomes $14.4 + 1 + 3 + 3 = 21.4$ dB. This is consistent with the measurement of 20 dB of average discrimination that was found to exist between an ATC base station antenna and MSV's satellite at 101° W. The parameters associated with Inmarsat's POR (178° W) satellite are similar to those of the AORE (15.5° W) satellite, except that the POR satellite views the Western coastal areas of the United States. Thus, the analysis presented for the AORE satellite also applies to the POR satellite. For these reasons, there is no cause for MSV to make further

measurements with low elevation satellites to confirm the actual base station discrimination values. *Inmarsat Opposition* at 15.

In general, the interference received by a satellite from a base station comprises two components: a component due to reflection of power from the ground and a component due to a side-lobe emission of the base station antenna. The power of the reflection from the ground will be substantially the same independent of the slant angle. This is a direct consequence of the random irregularities and contours of the ground. Thus, the power of the reflection will be 20 dB less (on average) relative to the incident power, independent of the slant angle. However, relative to the POR and AORE satellites, the reflection will be further attenuated by an additional 14.1 dB, relative to the strength of the reflection reaching the AORW satellite at 54° W, owing to the additional blockage associated with the low slant angles of the POR and AORE satellites. Thus, the interference component due to the reflection is negligible for the POR and AORE satellites.

Given the above, it may be concluded that for high slant angles, the dominant mechanism of interference reaching a satellite is from ground reflections, while for low slant angles, the dominant mechanism is associated with emissions of base station antenna side-lobes. However, as MSV has demonstrated in its application and herein, an average discrimination of at least 20 dB will exist between the output EIRP of an ATC base station antenna and the power that is launched towards an Inmarsat satellite independent of the dominant mechanism of interference (*i.e.*, ground reflection or antenna side-lobe emission). *See MSV ATC Modification Application, Supplement.*

II. Impact of TDD-Mode ATC Terminals Transmitting in the 1.5 GHz Band on Satellite METs Receiving in the 1.5 GHz Band

Inmarsat's argument that ATC terminals operating in TDD mode will increase the risk of overload/intermodulation interference to Inmarsat METs is unsupported and speculative. *Inmarsat Opposition* at 16. As an initial matter, the power radiated by ATC terminals will be very small compared to the power radiated by ATC base stations and the duty factor of an ATC terminal will be at most $\frac{1}{2}$ (*i.e.*, the terminal is transmitting $\frac{1}{2}$ of the time at most). Also, an ATC terminal will, at any given time, be radiating only one carrier whereas an ATC base station may be radiating two or more carriers. As such, the potential of an ATC terminal for causing overload/intermodulation interference to an Inmarsat MET is *de minimis*. Notwithstanding the above, any potential for interference is further mitigated by several additional factors that have previously been recognized by the Commission, including that (i) it is unlikely that METs will be used in urban areas where ATC operations will occur because MSS signals are often obstructed by buildings and the environment in general, and there are other more reliable and cheaper modes of communications that are more likely to be used (*ATC Recon Order* ¶ 56); (ii) Inmarsat METs are less susceptible to interference than the Commission had previously assumed and it is clear from testing and knowledge of receiver design that Inmarsat can deploy receivers in the future that can be less susceptible to interference (*id.* ¶¶ 55, 56); and (iii) coordination of contiguous frequency assignments pursuant to L band coordination negotiations will allow for more effective front-end filtering to be introduced in satellite METs (*id.* ¶ 59).

Exhibit A

Commission Decisions Requiring L Band Operators to Operate
in Accordance with 1999 SSA

MET Licenses to Access Inmarsat

- *COMSAT Corporation et. al., Memorandum Opinion, Order and Authorization, FCC 01-272, ¶ 115(c)-(d) (2001) (granting application of Stratos, Telenor (f/k/a COMSAT Mobile), Honeywell, and Deere to operate with Inmarsat):*

“115. IT IS FURTHER ORDERED that the applications listed in Appendix C to operate mobile earth terminals to provide domestic and international Mobile Satellite Service via the privatized Inmarsat system ARE GRANTED subject to the following conditions:

* * *

* * *

c. Operations shall be limited to the portions of the 1525-1559 and 1626.5-1660.5 MHz band coordinated for the Inmarsat satellite system in the most recent annual L-Band operator-to-operator agreement;

d. In the absence of a continuing annual L-band operator-to-operator coordination agreement, operations of METs in the 1525-1559 and 1626.5-1660.5 MHz bands will be on a non-interference basis until a future operator-to-operator agreement is concluded. In this instance, each licensee must notify the other four operators in these frequency bands that it will be operating on a non-interference basis. Each licensee must notify its customers that its operations are on a non-interference basis.”

- *Richtec Incorporated, Order and Authorization, 18 FCC Rcd 3295 (Chief, Satellite Division, International Bureau, March 7, 2003) (granting application to operate D+ terminals with Inmarsat):*

“17. IT IS FURTHER ORDERED that Richtec's mobile earth station operations shall be limited to the portions of the 1525-1544 and 1626.5-1645.5 MHz band coordinated for the satellite being accessed in the most recent annual L-band operator-to-operator agreement. In the absence of a continuing annual L-band operator-to-operator coordination agreement, Richtec's operation in the 1525-1530 MHz, 1530-1544 MHz, 1626.5-1645.5 MHz frequency bands (lower L-bands) will be on a non-interference basis until a future operator-to-operator agreement is concluded. Richtec shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall cease operations upon notification of such interference. Furthermore, Richtec must notify all other operators in these frequency bands that it will be operating on a non-interference basis. Richtec must also notify its customers in the United States that its operations are on a non-interference basis.”

MET Licenses to Access MSV and MSV Canada L Band Satellites

- *Vistar Data Communications, Inc., Order and Authorization*, 17 FCC Rcd 12899 (Deputy Chief, Satellite Division, International Bureau, July 2, 2002) (granting authority to operate half-duplex METs with MSV):

“17. IT IS FURTHER ORDERED that Vistar Data Communications, Inc.’s MET operations shall be limited to the portions of the 1525-1559 and 1626.5-1660.5 MHz band coordinated for the satellite being accessed in the most recent annual L-band operator-to-operator agreement.

18. IT IS FURTHER ORDERED that in the absence of a continuing annual operator-to-operator coordination agreement, Vistar Data Communications, Inc.’s operation in the 1525-1559 and 1626.5-1660.5 MHz band will be on a non-harmful interference basis. Consequently, in the absence of a coordination agreement, Vistar Data Communications, Inc. shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall cease operations upon written notification of such interference. Furthermore, Vistar Data Communications, Inc. must notify all other operators in these frequency bands that it will be operating on a non-harmful interference basis. Vistar Data Communications, Inc. must also notify its customers in the United States that its operations are on a non-harmful interference basis.”

- *Mobile Satellite Ventures Subsidiary LLC, Memorandum Opinion, Order and Authorization*, 19 FCC Rcd 4672 (Chief, International Bureau, March 12, 2004) (granting authority to operate additional half-duplex METs with MSV and MSV Canada satellites):

“7. IT IS FURTHER ORDERED that Mobile Satellite Ventures Subsidiary LLC’s MET operations shall be limited to 2.0 MHz of spectrum in each direction of the 1626.5-1645.5 MHz and 1530-1544 MHz band coordinated for the satellite being accessed in the most recent annual L-band operator-to-operator agreement, and that no additional spectrum will be requested or used.

8. IT IS FURTHER ORDERED that, in the absence of a continuing annual operator-to-operator coordination agreement, Mobile Satellite Ventures Subsidiary LLC’s operation in the 1626.5-1645.5 MHz and 1530-1544 MHz band will be on a non-harmful interference basis. Consequently, in the absence of a coordination agreement, Mobile Satellite Ventures Subsidiary LLC shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall cease operations upon written notification of such interference. Furthermore, Mobile Satellite Ventures Subsidiary LLC must notify all other operators in these frequency bands that it will be operating on a non-harmful interference basis. MSV, Inc. must also notify its customers in the United States that its operations are on a non-harmful interference basis.”

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- *Mobile Satellite Ventures Subsidiary LLC, Memorandum Opinion and Order*, 17 FCC Rcd 12894 (Deputy Chief, Satellite Division, International Bureau, July 2, 2002) (granting authority to operate additional half-duplex METs with MSV):

“9. IT IS FURTHER ORDERED that Mobile Satellite Ventures Subsidiary LLC’s MET operations shall be limited to the portions of the 1525-1559 and 1626.5-1660.5 MHz band coordinated for the satellite being accessed in the most recent annual L-band operator-to-operator agreement.

10. IT IS FURTHER ORDERED that, in the absence of a continuing annual operator-to-operator coordination agreement, Mobile Satellite Ventures Subsidiary LLC’s operation in the 1525-1559 and 1626.5-1660.5 MHz band will be on a non-harmful interference basis. Consequently, in the absence of a coordination agreement, Mobile Satellite Ventures Subsidiary LLC shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall cease operations upon written notification of such interference. Furthermore, Mobile Satellite Ventures Subsidiary LLC must notify all other operators in these frequency bands that it will be operating on a non-harmful interference basis. MSV, Inc. must also notify its customers in the United States that its operations are on a non-harmful interference basis.”

- *National Systems & Research Co., Order and Authorization*, 17 FCC Rcd 12011 (Deputy Chief, Satellite Division, International Bureau, June 28, 2002) (granting authority to operate METs with MSV):

“11. IT IS FURTHER ORDERED that National Systems & Research Co.’s MET operations shall be limited to the portions of the 1525-1559 and 1626.5-1660.5 MHz band coordination for the satellite being accessed in the most recent annual L-band operator-to-operator agreement.

12. IT IS FURTHER ORDERED that in the absence of a continuing annual operator-to-operator coordination agreement, National Systems & Research Co.’s operation in the 1525-1530 MHz, 1530-1544 MHz, 1626.5-1645.5 MHz frequency bands (lower L-band) and the 1545-1559 MHz and 1646.5-1660.5 MHz (upper L-band) frequency bands will be on a non-interference basis until a future operator-to-operator agreement is concluded. National Systems & Research Co. shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall cease operations upon written notification of such interference. Furthermore, National Systems & Research Co. must notify all other operators in these frequency bands that it will be operating on a non-interference basis. National Systems & Research Co. must also notify its customers in the United States that its operations are on a non-harmful interference basis.”

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- *Infosat Communications, Inc., Order and Authorization, 17 FCC Rcd 1610 (January 25, 2002) (granting authority to operate METs with MSV Canada satellite):*

14. IT IS FURTHER ORDERED that Infosat Communications, Inc. IS AUTHORIZED to operate in the 1525-1530 MHz, 1530-1544 MHz, and 1626.5-1645.5 MHz frequency bands (lower L-band) subject to the following conditions:

* * *

b. Operations shall be limited to the portions of the lower L-band coordinated for TMI satellite network in the most recent annual L-band operator-to-operator agreement;

15. IT IS FURTHER ORDERED that in the absence of a continuing annual L-band operator-to-operator coordination agreement, Infosat's operations of METs in the 1530-1559 and 1631.5-1660 MHz band will be on a non-harmful interference basis until a future operator-to-operator agreement is concluded. Infosat Communications, Inc. shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall cease operations upon notification of such interference. Furthermore, Infosat Communications, Inc. must notify all other operators in these frequency bands that it will be operating on a non-harmful interference basis. Infosat Communications, Inc. must also notify its customers in the United States that its operations are on a non-harmful interference basis."

- *TMI Communications and Company, L.P., Order and Authorization, 15 FCC Rcd 18117 (Chief, Satellite and Radiocommunication Division, September 25, 2000) (granting authority to operate METs with TMI):*

"8. Accordingly, IT IS ORDERED that Application File No.SES-LIC-19990318-00435 IS GRANTED and TMI Communications and Company, L.P. IS AUTHORIZED to operate up to 100,000 full-duplex tracking and asset management data services mobile earth terminals through the Canadian licensed MSAT-1 space station in portions of the 1545-1558.5 and 1646.5-1660 MHz band coordinated for the TMI satellite network in the most recent annual L-band operator-to-operator coordination agreement, in accordance with the technical specifications set forth in its application and its Radio Station Authorization, and consistent with the Commission's rules.

9. IT IS FURTHER ORDERED that in the absence of an annual operator-to-operator coordination agreement, TMI's operation in the 1545-1558.5 and 1646.5-1660 MHz band will be on a non-interference basis. Consequently, in the absence of a coordination agreement, TMI shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall immediately cease operations upon notification of such interference. Furthermore, TMI must notify the other four space station operators in these frequency bands that it will be operating on a non-interference basis. TMI must also notify its customers in the United States that TMI's operations are on a non-interference basis."

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- *SatCom Systems, Inc., Order and Authorization*, 14 FCC Rcd 20798 (November 30, 1999) (granting authority to operate METs with MSV Canada satellite):

“63. Accordingly, IT IS ORDERED that Application File Number 647-DSE-P/L-98; IBFS File Number SES-LIC-19980310-00272E9808159 IS GRANTED and SatCom Systems, Inc. IS AUTHORIZED to operate up to 25,000 mobile earth terminals through the Canadian licensed MSAT-1 space station in the portions of the 1545-1558.5 and 1646.5-1660 MHz band coordinated for the TMI satellite network in the most recent annual L-band operator-to-operator coordination agreement, to the extent indicated herein, in accordance with the technical specifications set forth in its application and its Radio Station Authorization, and consistent with the Commission's rules. In the absence of a continuing annual L-band operator-to-operator coordination agreement, SatCom's operation in the 1545-1558.5 and 1546.5-1660 MHz bands will be on a non-interference basis until a future operator-to-operator agreement is concluded. In this instance, SatCom must notify the other four operators in these frequency bands that it will be operating on a non-interference basis. SatCom must also notify its customers that SatCom's operations are on a non-interference basis.

64. IT IS FURTHER ORDERED that Application File Number 730-DSE-P/L-98; IBFS File No. SES-LIC-19980330-00339E980179 IS GRANTED and TMI Communications and Company, L.P. IS AUTHORIZED to operate up to 100,000 mobile earth terminals through the Canadian licensed MSAT-1 space station in the portions of the 1545-1558.5 and 1646.5-1660 MHz band coordinated for the TMI satellite network in the most recent annual L-band operator-to-operator coordination agreement, to the extent indicated herein, in accordance with the technical specifications set forth in its application and its Radio Station Authorization, and consistent with the Commission's rules. In the absence of a continuing annual operator-to-operator coordination agreement, TMI's operation in the 1545-1558.5 and 1646.5-1660 MHz band will be on a non-interference basis until a future operator-to-operator agreement is concluded. In this instance, TMI must notify the other four operators in the these frequency bands that it will be operating on a non-interference basis. TMI must also notify its customers in the United States that TMI's operations are on a non-interference basis.

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Exhibit B

Commission Statements Acknowledging that L Band Operators Are Limited to Frequencies Coordinated For Their Systems in the 1999 SSA

- *Flexibility for Delivery of Communications by MSS Providers, Report and Order*, IB Docket No. 01-185, 18 FCC Rcd 1962 (February 10, 2003) (“*ATC Order*”).

“The parties to the MoU last revised spectrum assignments in 1999 and, pending further negotiations, continue to operate under those assignments today.” (¶ 92)

“Although annual meetings were to have taken place under the terms of the Mexico City MoU, these meetings have not occurred since the parties last agreed to a complex spectrum-sharing arrangement in London in 1999; therefore, the parties continue to operate under the 1999 assignments pending further negotiations.” (n. 144)

- *Mobile Satellite Ventures Subsidiary LLC, Order and Authorization*, DA 04-3553 (Int’l Bur. 2004):

“The parties to the MOU last revised the spectrum assignments in 1999 and, pending further negotiations, continue to operate with those assignments today.” (n.8)

- *Flexibility for Delivery of Communications by MSS Providers, Memorandum Opinion and Order and Second Order and ATC Reconsideration Order*, IB Docket Nos. 01-185, FCC 05-30 (February 25, 2005) (“*ATC Reconsideration Order*”):

“These negotiations have not occurred since 1999, and the 1999 coordination agreement remains in effect.” (¶ 38)

“The current coordination agreement under which Inmarsat and MSV share L-band spectrum was finalized in 1999. Ideally, the L-band MSS operators should renegotiate their coordination agreement every year. Indeed, changes to the existing coordination agreement could help avoid some of the potential interference issues that could arise from deployment of MSS/ATC. At the same time, however, we acknowledge that it could take a great deal of time and effort to conduct further coordination negotiations. For this reason, *in the case of any L-band frequency that is currently the subject of a coordination agreement and is shared between an MSS operator and an MSS/ATC operator*, we will permit an MSS/ATC to cause a small increase in interference to another MSS operator’s system above the coordinated interference level when the coordinated interference level is already greater than 6% $\Delta T/T$. This measure accounts for the reality that MSS is currently operating in the L-band, and that it may be necessary and appropriate to allow a slightly higher level of interference than currently coordinated levels allow in order to permit ATC to begin operations. When L-band MSS operators enter into a new coordination agreement, this additional interference allowance will no longer apply, and MSS/ATC operators will be required to operate its ATC within the limits coordinated by the parties.” (¶ 44) (emphasis added)

Technical Certification

I, Dr. Peter D. Karabinis, Senior Vice President and Chief Technical Officer of Mobile Satellite Ventures Subsidiary LLC, certify under penalty of perjury that:

I am the technically qualified person with overall responsibility for the technical information contained in this Response. I am familiar with the Commission's rules, and the information contained in the Response is true and correct to the best of my knowledge and belief.



~~Dr. Peter D. Karabinis~~

Dated: January 26, 2006

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CERTIFICATE OF SERVICE

I, Sylvia A. Davis, a secretary with the law firm of Pillsbury Winthrop Shaw Pittman LLP, hereby certify that on this 26th day of January 2006, served a true copy of the foregoing by first-class United States mail, postage prepaid, upon the following:

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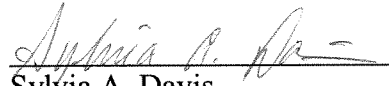
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