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

In the matter of	)	
	)	
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	)	SES-MOD-20051110-01561
	)	

**REPLY OF INMARSAT VENTURES LIMITED**

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February 7, 2006

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**REPLY OF INMARSAT VENTURES LIMITED**

Inmarsat Ventures Limited (“Inmarsat”) hereby replies to the response of Mobile Satellite Ventures Subsidiary LLC (“MSV”) regarding MSV’s applications to modify its licenses to operate an ancillary terrestrial component (“ATC”) in the L-Band.<sup>1</sup>

**I. Introduction and Summary**

In its Opposition, Inmarsat identified four primary areas in which MSV’s ATC modification application does not meet the requirements of the Commission’s ATC rules.<sup>2</sup> First, MSV fails to identify all L-Band spacecraft located at an orbital location that “sees” part of MSV’s ATC service area. Second, MSV fails to accurately identify all portions of the L-Band used by those spacecraft that MSV proposes to use for ATC. Third, MSV fails to substantiate (or, in most cases, even identify) the level of interference protection that its MSS spacecraft must afford those other spacecraft. Finally, MSV fails to demonstrate that its use of a bi-directional

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<sup>1</sup> Mobile Satellite Ventures Subsidiary LLC, Response to Opposition of Inmarsat Ventures Ltd., File Nos. SAT-MOD-20051104-00212, SAT-MOD-20051104-00211, SES-MOD-20051110-01561, SES-MOD-20051104-02556 (filed Jan. 26, 2006) (“MSV Response”).

<sup>2</sup> Inmarsat Ventures Limited, Consolidated Opposition to MSV, File Nos. SAT-MOD-20051104-00212, SAT-MOD-20051104-00211, SES-MOD-20051104-02556 (filed Jan. 13, 2006) (“Inmarsat Opposition”).

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time division duplex (TDD) architecture will not cause any greater interference than that permitted by the ATC rules. MSV still fails to address these deficiencies in its Response.

The primary purpose of the technical limits in the L-Band ATC rules is to protect other MSS systems from ATC-generated interference. For purposes of applying the rules to MSV's modification application, the critical threshold question is purely a factual one — whether any MSS system at an orbital location within view of the ATC service area uses a band segment that MSV also wishes to use for ATC.

As Inmarsat established in its Opposition, there are over a dozen L-Band spacecraft currently in orbit, within view of part of the United States, that share the L-Band with MSV. In fact, 86% of the spectrum MSV wishes to use for ATC currently falls into this “shared” category. MSV does not dispute this fact. Rather, MSV asserts (without any technical analysis) that most of those MSS uses could be adversely affected by ATC deployment only in certain limited parts of the United States. Thus, MSV asks the Commission to disregard the shared nature of those portions of the band, and deem those portions “coordinated exclusively for MSV” under the ATC rules. As to spectrum it shares with Inmarsat, MSV does not dispute that Inmarsat is currently using portions of the spectrum that MSV wants to use for ATC. Rather, MSV asserts that Inmarsat does not have the right, under governing international law, to use those portions of the spectrum. Thus, MSV asks the Commission to also disregard Inmarsat's uses, and deem those parts of the band as “unshared” as well.

MSV's response is inconsistent with the plain language of the ATC rules and also ignores the way the L-Band is used today. Nothing in the ATC rules suggests that MSS systems are not entitled to interference protection from ATC simply because the interference may come from a limited geographic area in the United States. Moreover, nothing in the ATC rules

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indicates that spacecraft, such as the recently-launched Inmarsat-4 (“I-4”) spacecraft that are actually using the L-Band, are not entitled to protection from ATC systems that are years away from deployment. Indeed, nothing in the ATC rules excludes the obligation of ATC systems to provide interference protection to an MSS network based on its status in the ITU frequency registration process.

It does not make sense to turn the clock back over six years, as MSV requests, and simply look at the state of L-Band usage when MSV walked away from the international spectrum negotiating table, and the last L-Band spectrum coordination agreement expired on December 31, 1999. In the intervening time, spacecraft have changed, new MSS systems have been launched, and the MSS world has generally evolved. MSV itself has been licensed for two new spacecraft that are not covered by the 1999 coordination agreement that MSV references, and one of which is the subject of these very ATC license modification applications.<sup>3</sup>

For shared band segments, the next relevant inquiry is whether MSV has negotiated a coordination agreement with the MSS systems with which it shares spectrum. If it has, MSV is bound to honor essentially those same interference protection criteria in deploying ATC.<sup>4</sup> If it has not, MSV is constrained to producing no more than a low, regulatory “default” level of interference. MSV has wholly failed to substantiate the protection criteria that it claims applies to the portions of the L-Band it shares with other MSS systems. In fact, MSV does not

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<sup>3</sup> See *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*”).

<sup>4</sup> In certain cases, the addition of ATC may produce a small additional level of interference, specifically an additional 1% delta T/T. 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 Band*, Memorandum Opinion and Order and Second Order on Reconsideration, 20 FCC Rcd 4616 at ¶ 45 (2005) (“*Second ATC Order on Reconsideration*”).

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even attempt to identify, as the ATC rules clearly require, the relevant protection criteria specified in its coordination agreements with potentially affected operators other than Inmarsat. Below, Inmarsat derives the relevant interference limit from its 1992 coordination agreement with MSV, which yields more stringent interference protection criteria than MSV admits. Inmarsat is unable, however, to address the extent to which MSV has coordination agreements with other MSS systems. If MSV does not have such agreements, the ATC rules provide for MSV's ATC deployment to be constrained to "default" interference protection levels with respect to those other systems with which it shares the L-Band.

Nor does MSV demonstrate, as the ATC rules require, that its proposal to use a TDD architecture will not cause more interference than the ATC rules otherwise would permit.

Because MSV has not addressed those deficiencies, MSV's application should be dismissed, or held in abeyance, until MSV adequately addresses them.

**II. Virtually All of MSV's Frequency Bands Are Subject to Significant Constraints on ATC Deployment Because They Are Shared With Other MSS Systems Within View of the United States**

MSV claims that most of the frequency bands it proposes to use for ATC should be deemed as exclusively available for MSV's use for purposes of the ATC rules. Thus, MSV asserts that there should be no limit on the extent to which MSV can deploy ATC in those band segments. MSV is wrong on both counts.

As Inmarsat demonstrated its Opposition, MSV actually shares approximately 90% of its L-Band spectrum with other MSS systems.<sup>5</sup> In light of Inmarsat's showing, MSV acknowledges that it does in fact share certain frequency bands with other MSS systems that serve parts of the world other than North America, but dismisses the frequency uses by those

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<sup>5</sup> Inmarsat Opposition at 6.

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other systems as irrelevant.<sup>6</sup> The ATC rules are very clear, however, that the technical limits on ATC deployment apply in *all cases* where MSV shares a band segment with another L-Band system at an orbital location that sees part of the United States. Moreover, without causing interference, MSV simply cannot use for ATC purposes those band segments that Inmarsat is currently using in the United States. The ATC rules plainly require MSV's ATC operations to protect *all L-Band spacecraft* operating with a view to the United States and all spectrum used by other L-Band MSS operators.

**A. MSV Must Protect Over a Dozen Potentially Affected MSS Spacecraft, Not Just the Few Spacecraft Serving North America That MSV Identifies**

One of the main purposes of the technical limits in the Commission's ATC rules is to prevent ATC service from generating more than a specified level of interference into other MSS systems that share the L-Band.<sup>7</sup> The modified rules adopted in 2005 are written specifically to protect "L-Band MSS satellite[s] making use of that band segment within the visible portion of the geostationary arc as seen from the ATC coverage area"<sup>8</sup> from ATC interference. As long as MSS satellite systems do not use a particular portion of the L-Band that MSV seeks to use, there is no need to constrain MSV's ATC operations to protect those systems from interference. In bands that are shared with other MSS networks, however, the ATC rules require that specified interference protection criteria be honored, and that ATC deployment be constrained to avoid undue impact on those other MSS networks.<sup>9</sup>

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<sup>6</sup> MSV Response at 2, n.8, 8.

<sup>7</sup> See, e.g., *Second ATC Order on Reconsideration* at ¶¶ 11, 41-42.

<sup>8</sup> 47 C.F.R. § 25.253(a)(1).

<sup>9</sup> *Id.* at §§ 25.253(a)(2)-(4)

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In order to provide meaningful protection to satellites “making use” of the L-Band, the ATC rules must be applied to MSV’s proposed system in a manner that takes into account the impact of the ATC system on *all* MSS systems that use the L-Band today with a view of the United States. In particular, all such L-Band MSS systems must be considered: (i) regardless whether those systems are part of the 1996 Mexico City Memorandum of Understanding (“Mexico City MOU”) that governs the use of the L-Band in the vicinity of North America, and (ii) regardless whether those uses were specified in a spectrum sharing agreement under the Mexico City MOU that expired on December 31, 1999. As depicted on the diagrams attached as Exhibit A, spacecraft using the L-Band outside the vicinity of the United States can be affected by ATC deployment to the extent that the “sidelobes” of the receive antennas on their spacecraft “see” parts of the United States.

These circumstances are clearly covered by the plain text of the ATC rules which speak generally of satellites “making use”<sup>10</sup> of the L-Band, located at orbital locations within a visible portion of the orbital arc as seen from the ATC coverage area. To the extent, as MSV asserts, that certain spacecraft with which it shares spectrum are “barely visible to MSV’s ATC coverage area near the coast of the continental U.S. and . . . only visible from Alaska and Hawaii,”<sup>11</sup> MSV should be required to address how it will constrain the use of the shared frequencies in the geographic areas that *are visible to those spacecraft*. Moreover, nothing in the ATC rules precludes the need to protect spacecraft that are using L-Band spectrum but have not yet completed the ITU’s frequency registration process.<sup>12</sup>

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<sup>10</sup> *Id.* at § 25.253(a)(1).

<sup>11</sup> MSV Response at 8.

<sup>12</sup> *Cf.* MSV Response at 7-9. MSV’s ATC uses, which do not conform with the ITU allocation table, must protect all L-Band spacecraft from harmful interference pursuant to ITU Radio



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**B. MSV Must Protect All Spectrum Used by Inmarsat and Other L-Band MSS Operators**

Table I-1 contained in Exhibit B to this Reply provides a “snapshot” of the L-Band spectrum usage, as of January 13, 2006, by L-Band spacecraft at orbital locations with a view of part of the United States. Because MSV has wholly ignored its obligation to identify those affected L-Band spacecraft, and their spectrum usage, the attached Table (which updates and refines similar information that Inmarsat submitted in its January 13 Opposition) serves as a useful *starting point* for demonstrating the deficiencies in MSV’s ATC applications, and shows the potential impact of allowing MSV’s ATC system to operate without limit in portions of the L-Band that other MSS systems currently are using. In its Response, MSV simply ignores this data and still fails to indicate how, in the absence of a coordination agreement, it will protect *all existing L-Band MSS uses*.

MSV suggests that this data is not relevant because certain of the spectrum uses Inmarsat has identified are not delineated in a spectrum sharing agreement under the Mexico City MOU.<sup>13</sup> As the Commission is aware, however, there is no spectrum sharing agreement in effect under the Mexico City MOU, and there has not been one in effect since December 31,

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Regulations. *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*, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962 ¶ 213 (2003) (“2003 ATC Order”) (“MSV acknowledges that, under applicable ITU Radio Regulations, its ATC operations will be required to operate on a non-harmful interference basis to all other services and systems.”).

<sup>13</sup> See MSV Response at 5.

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1999.<sup>14</sup> In fact, the 1999 spectrum sharing agreement specifically provided that the [REDACTED].<sup>15</sup> It was not so extended. MSV admits as much.<sup>16</sup>

The Commission itself has acknowledged that it was MSV's predecessor who made the strategic decision not to renew or extend the last L-Band coordination agreement that expired in December 1999, deciding that doing so might help it in international spectrum negotiations.<sup>17</sup> MSV's withdrawal from the Mexico City MOU process in 1999 left other MSS operators with no practical alternative other than ensuring, as they have since December 1999, that they conduct L-Band operations over North America on a non-harmful interference basis. In fact, since the expiration of the 1999 L-Band spectrum sharing agreement, Inmarsat has permissibly operated on a co-channel basis with MSV, without causing harmful interference,<sup>18</sup> in

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<sup>14</sup> See Inmarsat Opposition at 7-8.

<sup>15</sup> *1999 Operating Agreement for Geostationary Mobile Satellite Systems Operating in the Bands 1525-1544/1545-1559 MHz and 1626.5-1645.5/1646.5-1660.5 MHz*, Ottawa, Canada, § V (Jun. 5, 1998).

<sup>16</sup> 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) ([REDACTED]).

<sup>17</sup> See Brief for Appellee (FCC), *AMSC Subsidiary Corporation v. FCC*, Case No. 99-1513, p. 34-35 (D.C. Cir. May 17, 2000) (Public Copy) ("One is reminded of the man who killed his parents and asked for mercy because he was an orphan. As AMSC acknowledges in its brief . . . it was AMSC that vetoed the proposed extension of the operating agreement, despite the absence of any immediate interference problem, believing it was better strategically to force the issue of how to deal with the spectrum shortage.") (emphasis added).

<sup>18</sup> To Inmarsat's knowledge, there has not been any harmful interference from Inmarsat into MSV (co-channel or non-co-channel) from "high speed data" or any other Inmarsat services, and Inmarsat and MSV have routinely resolved the typical, occasional operational issues that arise between spacecraft that share spectrum.

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accordance with ITU Radio Regulations,<sup>19</sup> and in accordance with a long line of Commission precedent that governs MSV as well.<sup>20</sup> Moreover, the Commission itself recognized in the 2003 *ATC Order* that there are L-Band MSS systems operating today whose operations are not specified in the 1999 spectrum sharing agreement.<sup>21</sup> Thus, MSV cannot simply assume that the L-Band is used exactly the same way it was used in 1999, particularly when L-Band operators in Regions 1 (Europe) and 3 (Asia) have effectuated changes in their systems that affect the way the L-Band is used on the edges of Region 2 (the Americas).<sup>22</sup>

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<sup>19</sup> ITU Radio Regulation No. 4.4 (operations on a non-harmful interference basis).

<sup>20</sup> See, e.g., *MSV 101° Order* at ¶ 59; *MSV 63.5° Order* at ¶ 39.

<sup>21</sup> See 2003 *ATC Order* at 1994, n.144 (recognizing that a Japanese system would need to obtain L-Band spectrum to fully operate its satellite pending the negotiation of a new operating agreement); see also *MSV Response* at 2, n.8 (acknowledging that L-Band spectrum in North American region is also shared with Japan's MTSAT satellite).

<sup>22</sup> There has been no change for years in the amount of spectrum or the specific frequencies that Inmarsat uses to serve the United States. And Inmarsat intends to serve the United States from its new I-4 spacecraft over the very same portions of the L-Band that Inmarsat has been using to serve the United States. Consistent with its ITU rights, and in the absence of a spectrum sharing agreement, Inmarsat is entitled to continue to use those same band segments. However, Inmarsat's obligations to operate on a non-harmful-interference basis currently constrain its ability to operate in additional band segments over the United States. For purposes of securities disclosure, it therefore was entirely accurate for Inmarsat to characterize its North American L-Band spectrum as effectively "frozen" for all intents and purposes. See *Inmarsat April 2005 Form F-20* at 7, 48. But that does not mean, as MSV asserts, see *MSV Response* at 6, n.16, that the 1999 spectrum sharing agreement is still in effect, or that it still governs the rights or obligations of the parties. To the contrary, Inmarsat's obligations to operate on a non-harmful interference basis continue to govern.

For the reasons provided above, there is no validity to MSV's claim that Inmarsat "is claiming to have the right to operate on every L-Band frequency" in order to serve the United States using I-4. *MSV Response* at 6, n.17. MSV's pejorative mischaracterization of I-4 as "uncoordinated" and "simply a rogue satellite that has no internationally recognized rights," see *id.*, ignores the facts and the governing law. As an initial matter, Inmarsat's MSS network at 54° W.L. was coordinated with MSV and notified to the ITU for inclusion in the Master International Frequency Register. The relocation of that network to 53° W.L. (one degree further away from MSV) has no adverse impact on MSV. Nor does anything in the ITU Radio Regulations limit the "make" or the "model" of the spacecraft that Inmarsat may employ in its ITU registered MSS network. Rather, the ITU process provides for the coordination of the use

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For these reasons, Inmarsat emphasizes that the spectrum usage identified in Table I-1 of Exhibit B remains subject to change within the constraints of the interference protection criteria and spectrum reuse matrices agreed between Inmarsat and MSV (and between other operators), and within the constraints of the spectrum uses being made by other operators, as such changes have occurred over the course of the past six years, during which there has been no spectrum sharing agreement under the Mexico City MOU. As Inmarsat has previously explained, Inmarsat intends to serve the United States from its new I-4 spacecraft over the very same portions of the L-Band that Inmarsat has been using to serve the United States, and using the same interference protection criteria under which it has coexisted with MSV for years.

The plain language of the ATC rules indicates that the threshold question in determining the interference limits to which the ATC applicant will be subject is whether another L-Band MSS satellite is “making use of [a certain] band segment within the visible portion of the geostationary arc as seen from the ATC coverage area.”<sup>23</sup> Therefore, actual use of spectrum, and not the expired 1999 spectrum sharing agreement, is the relevant basis for this determination.

**1. MSV Cannot Use the Same Spectrum Used by Inmarsat in the United States**

Inmarsat is using certain portions of the L-Band in the United States that MSV wishes to use for ATC. MSV does not suggest that it is technically possible for it to provide ATC in that part of the L-Band at the same time as Inmarsat is using that spectrum. Nonetheless, MSV asks that the Commission ignore this existing use by Inmarsat and allow MSV to operate

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of specified radio frequencies within certain delineated technical parameters. Inmarsat may therefore operate the I-4 satellite under the parameters for its coordinated MSS network, as long as Inmarsat respects the protection criteria agreed with MSV. *See infra* pp. 16-18.

<sup>23</sup> 47 C.F.R. § 25.253(a)(1).

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ATC without limit in these bands.<sup>24</sup> There is no basis for using this proceeding to resolve the longstanding dispute between Inmarsat and MSV over this spectrum, which MSV has not used for years, but which Inmarsat demonstrably uses to serve North America, the surrounding ocean regions, and the surrounding airspace, and needs to continue to use. MSV may dispute Inmarsat's right to use this spectrum, but, for purposes of providing interference protection, the ATC rules require that this actual spectrum usage be taken into account.<sup>25</sup>

Moreover, this is not the appropriate forum for addressing this spectrum dispute. MSV admits that the basis for its use of the L-Band on the satellite networks over which it proposes to provide ATC is the Mexico City MOU, which provides a clear multilateral process to address matters such as this.<sup>26</sup> Moreover, to the extent that MSV references arrangements between Inmarsat and MSV that have given rise to this dispute, the Commission has a clear policy not to insert itself in commercial disputes between parties, particularly, as here, where

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<sup>24</sup> MSV Response at 7.

<sup>25</sup> Contrary to what MSV argues, the fact that the parties to the Mexico City MOU have operated on a non-harmful interference basis since the 1999 spectrum sharing agreement expired, and have periodically informed each other about changes in their operations, does not mean that the 1999 agreement "continues to effectively govern the operations of L band MSS providers." MSV Response at 6. Without an agreement in place, there is no specific spectrum assignment to any party; thus, no party has anything to "loan" or "recall." Inmarsat therefore does not agree with MSV's recitation (at various places in MSV's Response) of the history of spectrum assignments under the Mexico City MOU, its characterization of the terms and conditions under which various operators used or use portions of the L-Band, its assertions whether a specific portion of the L-Band was ever "loaned," its assertions about which Inmarsat satellites are covered by the MOU, or its assertions that Inmarsat somehow is improperly holding on to spectrum that Inmarsat is and has been using.

<sup>26</sup> *Memorandum of Understanding for the Intersystem Coordination of Certain Geostationary Mobile Satellite Systems Operating in the Bands 1525-1544/1545-1559 MHz and 1626.5-1645.5/1646.5-1660.5 MHz*, Mexico City, Mexico (Jun. 18, 1996); see also *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.") (emphasis added).

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there is a specified forum for the resolution of the dispute.<sup>27</sup> There is no basis for the Commission to interject itself into commercial negotiations between Inmarsat and MSV. In the meantime, the ATC rules are clear that all L-Band uses on spacecraft with a view of the United States must be taken into account.

**2. L-Band Operators Are Not Constrained to the Expired 1999 Spectrum Sharing Agreement**

MSV next argues that certain statements by the Commission, some in totally different contexts, constrain the uses of the L-Band that need to be taken into account for purposes of applying the interference protection criteria specified in the *Second ATC Order on Reconsideration*.<sup>28</sup> Whether the Commission's summary description of the state of L-Band coordination at the time of the *Second ATC Order on Reconsideration* was entirely complete<sup>29</sup>

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<sup>27</sup> See, e.g., *Listeners' Guild, Inc. v. FCC*, 813 F.2d 465, 469 (D.C. Cir. 1987) (noting the Commission's "longstanding policy of refusing to adjudicate private contract law questions for which a forum exists" elsewhere for resolution).

<sup>28</sup> MSV Response at 6, Exhibit B.

<sup>29</sup> See MSV Response at 6. In contrast to the language MSV cites in Exhibit B to its Response, the Commission has correctly held in other contexts that the 1999 spectrum agreement is long expired and does not govern the rights or obligations of the parties. See *MSV 101° Order* at ¶ 34 ("While the most recent annual operator-to-operator agreement has not been renewed since 1999, the five parties have continued to coordinate their operations informally and have been operating interference-free."); *MSV 63.5° Order* at ¶ 23 (same); *Comsat Order*, 16 FCC Rcd 21661, ¶ 6 (2001) ("No operator-to-operator agreement has been in effect since year-end 1999."); see also *SatCom/TMI Order*, 14 FCC Rcd 20798, ¶ 34 (1999) ("The operator-to-operator agreement expires on December 31 each year.") (recognizing that without a new operating agreement, the 1999 Agreement would expire at the end of the year and would not govern the continued use of L-Band spectrum); *AMSC Subs. Corp. v. FCC*, 216 F.3d 1154, 1159-1160 (D.C. Cir. 2000) ("We note, without surprise, that AMSC does not claim to have experienced any interference since December 31, 1999, when the last coordination agreement expired.").

When the absence of a coordination agreement served its purpose, MSV's predecessor had this same interpretation — that 1999 spectrum agreement is long expired and does not govern the rights or obligations of the parties. See Letter to Magalie Roman Salas, FCC, from Lon C. Levin, Vice President and Regulatory Counsel for American Mobile (Oct. 19, 1999)

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does not alter the plain text of the ATC rules, or alter the underlying premise that ATC uses may not cause more interference into other MSS systems than MSV's own MSS system may cause.

Nor is it relevant what license conditions the Commission may have imposed on the provision of L-Band service in the United States over the TMI (MSV Canada) or Inmarsat spacecraft licensed by Canada or the U.K.<sup>30</sup> Nothing in those decisions constrains the ability of those systems to use certain L-Band frequencies in the vicinity of North America, or precludes consideration of the impact of MSV's ATC proposal on those uses.

Nonetheless, Inmarsat is compelled to set the record straight on what those license conditions actually say. As noted in Exhibit A of MSV's Response, the Commission's L-Band licensing conditions generally have contained two conditions: (i) one allowing service in the United States *potentially* to be provided anywhere in the L-Band (1525-1544 and 1626.5-1645.5 MHz) *on a non-harmful interference basis*, in the absence of a spectrum sharing agreement, and (ii) one constraining service in the United States to the "portions" of the band specified in a spectrum sharing agreement when such an agreement is in existence. MSV's interpretation of the second condition as limiting the first is wholly inconsistent with the Commission's stated intent where these types of conditions first were adopted, and with the decision of the United States Court of Appeals for the D.C. Circuit that interpreted that decision. In fact, MSV ignores

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(indicating that as of January 1, 2000 there is no spectrum sharing agreement among the five North American L-band MSS operators (cited in *SatCom Order*, 14 FCC Rcd 20798 at n.87); Summary Record of [REDACTED]; Final Reply Brief for Appellant (AMSC), *AMSC Subsidiary Corporation v. FCC*, Case No. 99-1513, p. 2 (D.C. Cir. May 17, 2000) (Public Copy) ("Beginning January 1, 2000, there has not even been such a short-term sharing arrangement" governing use of the L-Band.").

<sup>30</sup> See MSV Response at 5, Exhibit A.

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the express language in the Commission's orders, as well as the plain language of the ordering clauses themselves.<sup>31</sup>

The genesis of these two conditions is the October 1999 *TMI Market Access Order*, in which MSV's affiliate, MSV Canada (then known as TMI) was granted U.S. market access. In that case, the Commission acknowledged that the 1999 spectrum sharing agreement would soon expire and addressed how L-Band operations would occur "without an agreement assigning each of the five operators L-band frequencies."<sup>32</sup> Thus, the licensing conditions that the Commission adopted to cover the absence of a spectrum sharing agreement provided the possibility for operations anywhere in the 33 MHz of L-Band uplink or downlink spectrum, as long as those operations were conducted on a non-harmful interference basis.<sup>33</sup> If, as MSV asserts, the Commission had intended to constrain operations in the United States to the spectrum last designated in the 1999 spectrum sharing agreement, the Commission simply would have specifically constrained the bands in which service could be provided to the portions designated in that agreement. There would have been no need for the non-harmful interference condition that applies in the absence of a coordination agreement.

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<sup>31</sup> Inmarsat incorporates by reference the full briefing of the Commission's L-Band licensing policy established in the *TMI Market Access Order* and the *COMSAT Order* that Inmarsat provided in another context. See Inmarsat Consolidated Opposition, SkyWave Mobile Communications Corp., Application for Modification of Blanket License to Operate Mobile Earth Terminals with Inmarsat 4F2 at 52.75° W, File No. SES-MFS-20051207-01709 (Call Sign E030055), Satamatics Inc., Application for Modification of Blanket License to Operate Mobile Earth Terminals with Inmarsat 4F2 at 52.75° W, File No. SES-MFS-20051202-01665 (Call Sign E020074), at 15-20 (filed Feb. 2, 2006).

<sup>32</sup> *SatCom Systems, Inc., et al.*, 14 FCC Rcd 20798, 20814 ¶ 33 (1999) ("*TMI Market Access Order*") (operations "will be on a non-interference basis until a future operator-to-operator agreement is reached.").

<sup>33</sup> *TMI Market Access Order* at 21712 ¶ 115(d).



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The United States Court of Appeals for the D.C. Circuit agreed with this interpretation of the two conditions.<sup>34</sup> The court recognized that in permitting TMI's entry into the United States market in 1999, the Commission allowed L-Band operators potentially to operate on frequencies that previously had been coordinated for MSV, on a non-harmful interference basis, because the spectrum assignments established in the 1999 spectrum sharing agreement were no longer in effect.<sup>35</sup>

The Commission followed this same course in granting market access to the Inmarsat system in the 2001 *COMSAT Order*. MSV's interpretation of the *COMSAT Order*— that the Commission has required L-Band service providers to continue to comply with the frequency assignments that expired when the last spectrum sharing agreement terminated on December 31, 1999<sup>36</sup> — is undermined by the express language of that decision. The Commission recognized in the *COMSAT Order* that two years had passed since the TMI decision, and that there still was no spectrum sharing agreement. The Commission again expressly rejected MSV's request to constrain Inmarsat's L-Band distributors to using the frequency assignments last made in an expired spectrum sharing agreement: “[T]here is no permanent assignment of specific spectrum to any L-band operator. Thus, no operator can assert any claim with respect to a specific piece of spectrum.”<sup>37</sup> The Commission included two conditions: (i) one addressing the existing scenario in which there was no spectrum sharing agreement, and (ii) one addressing the possibility that a future spectrum agreement would be

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<sup>34</sup> *AMSC Subsidiary Corp. v. FCC*, 216 F.3d 1154, 1158 (D.C. Cir. 2000).

<sup>35</sup> *Id.* at 1158-1159 (citing *TMI Market Access Order*, 14 FCC Rcd at 20826 ¶¶ 63-64).

<sup>36</sup> MSV Response at 3, Exhibit A.

<sup>37</sup> *COMSAT Corporation d/b/a Comsat Mobile Communications, et al.*, 16 FCC Rcd 21661, 21698-21699 ¶¶ 71-73 (2001) (“*COMSAT Order*”).

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entered into specifying the bands available for each MSS operator.<sup>38</sup> That the Commission did not constrain the frequencies that could be used in the absence of a spectrum sharing agreement is reinforced by the express recognition that Inmarsat distributors were not being limited to operation on “frequencies coordinated for [Inmarsat]” in that circumstance.<sup>39</sup> Therefore, MSV is wrong that the ordering clauses cited in Exhibit A of MSV’s Response constrain L-Band uses to the segments last assigned in the 1999 spectrum sharing agreement.

**III. The Limits on MSV’s ATC Deployment Are Far More Significant Than MSV Recognizes**

In MSV’s Response, MSV again fails to meet its burden to identify the existence of any coordination agreements that allow it to deploy ATC in shared frequency bands at a level beyond the “default” 6%  $\Delta T/T$  level specified in the Commission’s rules. MSV does not do so with respect to the Japanese, Australian and Indonesian-licensed MSS systems with which it shares spectrum on a co-channel basis. Nor does it do so with respect to Inmarsat. In the absence of such a showing, the ATC rules are clear — MSV’s ATC operations are constrained to the 6%  $\Delta T/T$  level that is presumed not to create an interference problem.

Inmarsat cannot address the extent to which MSV has coordination agreements with the other MSS systems with which MSV shares the L-Band. Presumably, however, if MSV had such agreements, it would have identified them. In the absence of such an agreement, the *Second ATC Order on Reconsideration* is clear that the 6%  $\Delta T/T$  protection criterion applies.<sup>40</sup>

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<sup>38</sup> *Id.* at 21712 ¶¶ 115(c)-(d).

<sup>39</sup> *Id.* at 21698 ¶¶ 71, 72 & n.175. Paragraph 115(c) of the *COMSAT Order* — limiting spectrum assignments to “the most recent annual L-Band operator-to-operator agreement” — is fully consistent with this interpretation. Paragraph 115(c) provides a mechanism for automatically conforming the license terms to each subsequently entered into spectrum sharing agreement under the Mexico City MOU.

<sup>40</sup> *Second ATC Order on Reconsideration* ¶¶ 41, 43.

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As to Inmarsat, MSV is simply wrong that Inmarsat has agreed accept 58.6% as the  $\Delta T/T$  interference limit between the MSV system and the Inmarsat system. The only support MSV provides for its proposed interference limit is a value used by the Commission in a context that did not involve the current ATC rules, and the basis of which is unclear in any event.<sup>41</sup>

The technical parameters under which Inmarsat and MSV share spectrum on a co-channel basis was established in a 1992 bilateral coordination agreement between the United States and the United Kingdom<sup>42</sup> with respect to the MSV and Inmarsat MSS networks.<sup>43</sup> That agreement established interference protection criteria in the form of carrier to interference (C/I) levels that Inmarsat and MSV agreed to accept from each other. That agreement also specified key underlying parameters, such as mobile earth terminal EIRP and bandwidth,<sup>44</sup> Inmarsat satellite antenna discrimination,<sup>45</sup> Inmarsat satellite G/T and spot beam antenna gain.<sup>46</sup> While

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<sup>41</sup> See MSV Response at 8-9. Contrary to MSV's assertion, see MSV Response at 9, the  $\Delta T/T$  comparison the Commission made in a technical appendix to the *2003 ATC Order* is not some type of "finding" that Inmarsat "cannot disclaim" now. There was no reason to question that calculation because nothing in the 2003 ATC rules constrained ATC deployment to a certain  $\Delta T/T$  interference limit. The rules have since changed, and now reference the  $\Delta T/T$  interference limit that can be derived from actual coordination agreements. There is no conceivable reason, in the context of applying the new, 2005 ATC rules, not to apply the technical parameters actually agreed between MSV and Inmarsat, as specified in the coordination agreements that Inmarsat identifies below.

<sup>42</sup> The United Kingdom has assumed the international spectrum agreements that Inmarsat entered into prior to its privatization.

<sup>43</sup> See Summary Record, [REDACTED] ("[REDACTED] Meeting Summary Record").

<sup>44</sup> The maximum MET EIRP density given in the MSV technical parameters for the [REDACTED], [REDACTED] Meeting Summary Record at Annex 2, Set 2/Page 2A (Interfering Carrier Parameters, [REDACTED]), and MSV agreed to a [REDACTED] of this value, *id.* at Annex 2, Set 2/Page 5 (Footnotes, Return).

<sup>45</sup> In the case of [REDACTED], the reference case addressed the [REDACTED] beam and [REDACTED] beam. The agreed Inmarsat satellite discrimination for this reference case was [REDACTED]. [REDACTED] Meeting Summary Record at Annex 2, Set 2/Page 0.

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that agreement did not specify a  $\Delta T/T$  interference limit between the parties, the information contained in that agreement allows such a value to be derived. As set forth in Exhibit C, the correct value is a [REDACTED]  $\Delta T/T$  interference limit, far less than MSV asserts.

In this regard, it bears note that in the context of requests for authority to use the new Inmarsat 4 satellite to serve the United States, MSV argues that there are no agreed protection criteria between MSV and Inmarsat.<sup>47</sup> If that were truly the case, MSV would be constrained to the 6%  $\Delta T/T$  limit specified in the ATC rules, and not the much larger value it asserts here. The Commission clearly provides: “[A]n MSS/ATC operator in the L-band may increase the noise level of another co-primary MSS system by no more than 6%  $\Delta T/T$  from the MSS/ATC operator’s entire system, both MSS and ATC, *without a specific coordination agreement being accepted by all affected parties.*”<sup>48</sup> As Inmarsat has noted in that other context, however, the technical envelope within which Inmarsat has been operating since the expiration of the 1999 spectrum sharing agreement, and within which it intends to continue to operate the Inmarsat-4 spacecraft, is created by the very same 1992 bilateral agreement that provides the basis for MSV to deploy ATC at a level above the default 6%  $\Delta T/T$  limit. If that agreement is an adequate basis to govern the extent to which MSV can deploy ATC, on both its current MSS

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<sup>46</sup> The relevant values are [REDACTED] for the G/T and [REDACTED] for the antenna gain. These values are derived from the results of the [REDACTED], which formed the basis for the [REDACTED], as noted in the [REDACTED] Meeting Summary Record at 2. *See* [REDACTED], Inmarsat MSS System Technical Characteristics at Section 3 (Service Area) (nominal edge of coverage is [REDACTED]) (specifically, it is [REDACTED]), Attachment 3 (Satellite Antenna Patterns) (peak gain of [REDACTED]), Attachment 4 (Space Segment Parameters) (spot beam gain is [REDACTED]).

<sup>47</sup> *See, e.g.*, Reply of Mobile Satellite Ventures Subsidiary LLC to the Oppositions of Stratos Communications, Inc., telenor Satellite, Inc., and Inmarsat Ventures Limited, File No. SES-MFS-20051122-01614 – 01618, SES-MFS-20051123-01626 – 01630, at 8 (filed Jan. 31, 2006) (arguing that “no technical envelope” was established in the 1992 coordination agreement).

<sup>48</sup> *Second ATC Order on Reconsideration* at ¶ 41 (emphasis added).

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spacecraft, and its *uncoordinated* next-generation MSS spacecraft, it surely is a sufficient basis under which Inmarsat may operate Inmarsat-4.

**IV. MSV Does Not Demonstrate That a TDD Architecture Would Produce No More Interference Than the ATC Rules Permit**

Under the original ATC rules, ATC was constrained to a “forward band” mode of operation, whereby ATC mobile terminals transmit in the MSS uplink bands, and ATC base stations transmit in the MSS downlink bands. This was the interference dynamic in the L-Band that the Commission and the parties to the ATC proceeding analyzed in countless technical showings. In the *Second ATC Reconsideration Order*, the Commission opened the possibility for the use of other modes of operation, such as time division duplex (TDD), under which both ATC mobile terminals and base stations operate in the same part of the band, with their transmissions separated by time to avoid interference. Recognizing that TDD represented an entirely new interference dynamic, the Commission opened the possibility of using such a non-forward band system architecture subject to a critical threshold showing: if the applicant *demonstrates* that such a system architecture will cause no greater interference to other MSS systems in the L-Band than the rules permit.<sup>49</sup> The rule is clear, however, that the *ATC applicant bears the burden* of demonstrating that such an architecture will cause no greater interference than the rules permit. MSV has not met this burden.

In its Opposition, Inmarsat identified two new interference dynamics presented by TDD, which MSV must demonstrate do not adversely affect the level of interference otherwise

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<sup>49</sup> 47 C.F.R. § 25.149(a)(i), note (“L-Band MSS licensee is permitted to apply for ATC authorization based on a non-forward-band mode of operation provided it is able to demonstrate that the use of a non-forward-band mode of operation would produce no greater potential interference than that produced as a result of implementing the rules of this section.”).

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permitted by the ATC rules: (i) interference from ATC base stations into Inmarsat spacecraft; and (ii) interference from ATC mobile terminals into nearby Inmarsat mobile earth terminals.<sup>50</sup>

With respect to the first interference scenario, Inmarsat's Opposition highlighted the interference path from the transmitting ATC base stations into the Inmarsat satellite receivers operating with low elevation angles to the location of the ATC base station. As the attached Technical Annex contained in Exhibit D explains, there are a number of flaws in MSV's response, the most significant of which is MSV's reliance on the propagation model used in the *2003 ATC Order* to quantify the effects of propagation *between the user on the ground and the satellite*. That model is inapplicable to the situation here of the link between *a base station and a satellite*. Base stations, by their very nature, are located in positions that give them the best possible coverage to their user population. Thus, they almost exclusively are located in elevated positions, such as the roofs of buildings or other structures, or on naturally high ground, such as hills. From these positions, there will be in most cases a clear line-of-sight to the satellite with almost none of the obstructions expected to occur in the signal path between *a user* and the satellite.

With respect to the second interference dynamic (interference from MSV mobile terminals into Inmarsat mobile earth terminals), MSV fails to address the fact that there are circumstances where users of Inmarsat terminals will likely be "rubbing shoulders" with MSV customers operating ATC terminals nearby, and MSV's only solution appears to be that *Inmarsat* should deploy terminals that are more resistant to this type of problem.<sup>51</sup> The ATC rules are

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<sup>50</sup> Inmarsat Opposition at 14-16.

<sup>51</sup> In the *Second ATC Order on Reconsideration*, the Commission addressed the impact on Inmarsat mobile earth terminals operating near *ATC base stations*. *Second ATC Order on Reconsideration* at ¶ 56. The Commission did not "find" that Inmarsat users would not rub

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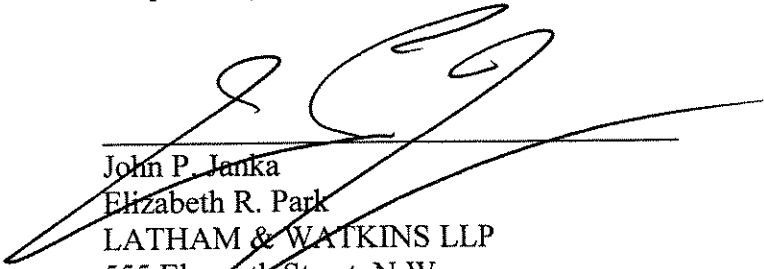
clear that the burden is on MSV to address this issue (not Inmarsat), and MSV has not yet done so.

**V. Conclusion**

MSV's modification application fails to address a number of critical FCC rule requirements: (i) identifying all spacecraft that use the L-Band at an orbital location that "sees" part of MSV's ATC service area, (ii) accurately identifying all portions of the L-Band MSV proposes to use for ATC that those spacecraft also use, (iii) substantiating the level of interference generated by MSV's system that the other MSS systems have accepted as not adversely affecting their operations, and (iv) demonstrating that the use of TDD will not produce any greater interference than that permitted by the ATC rules. Nor has MSV addressed those deficiencies in its Response. Therefore, MSV's application should be dismissed, or held in abeyance, until MSV adequately addresses these deficiencies.

Respectfully submitted,

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*Counsel for Inmarsat Ventures Limited*

February 7, 2006

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shoulders with MSV ATC users if MSV operated under a new, TDD architecture that had not even been proposed.

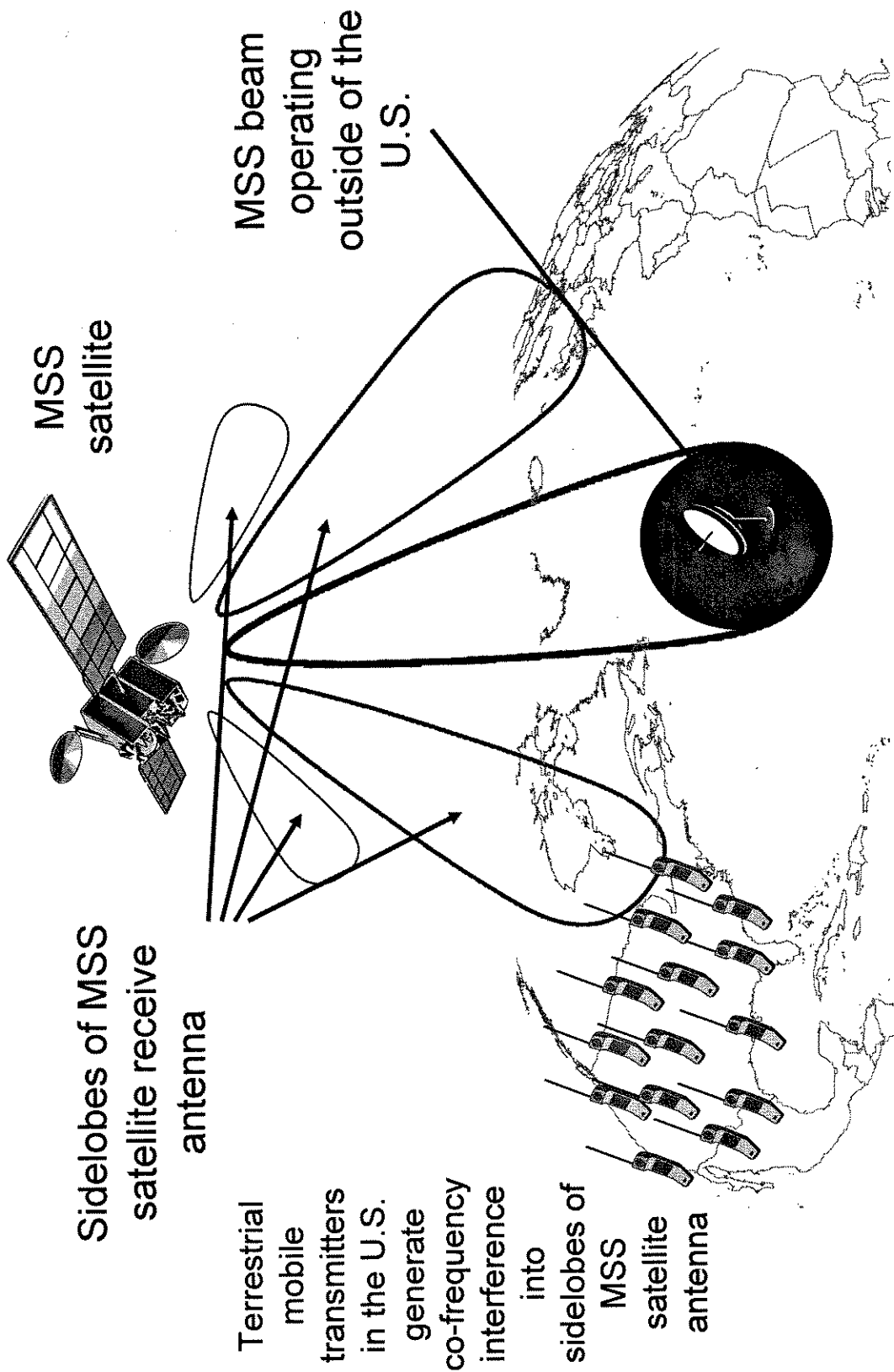
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**EXHIBIT A**

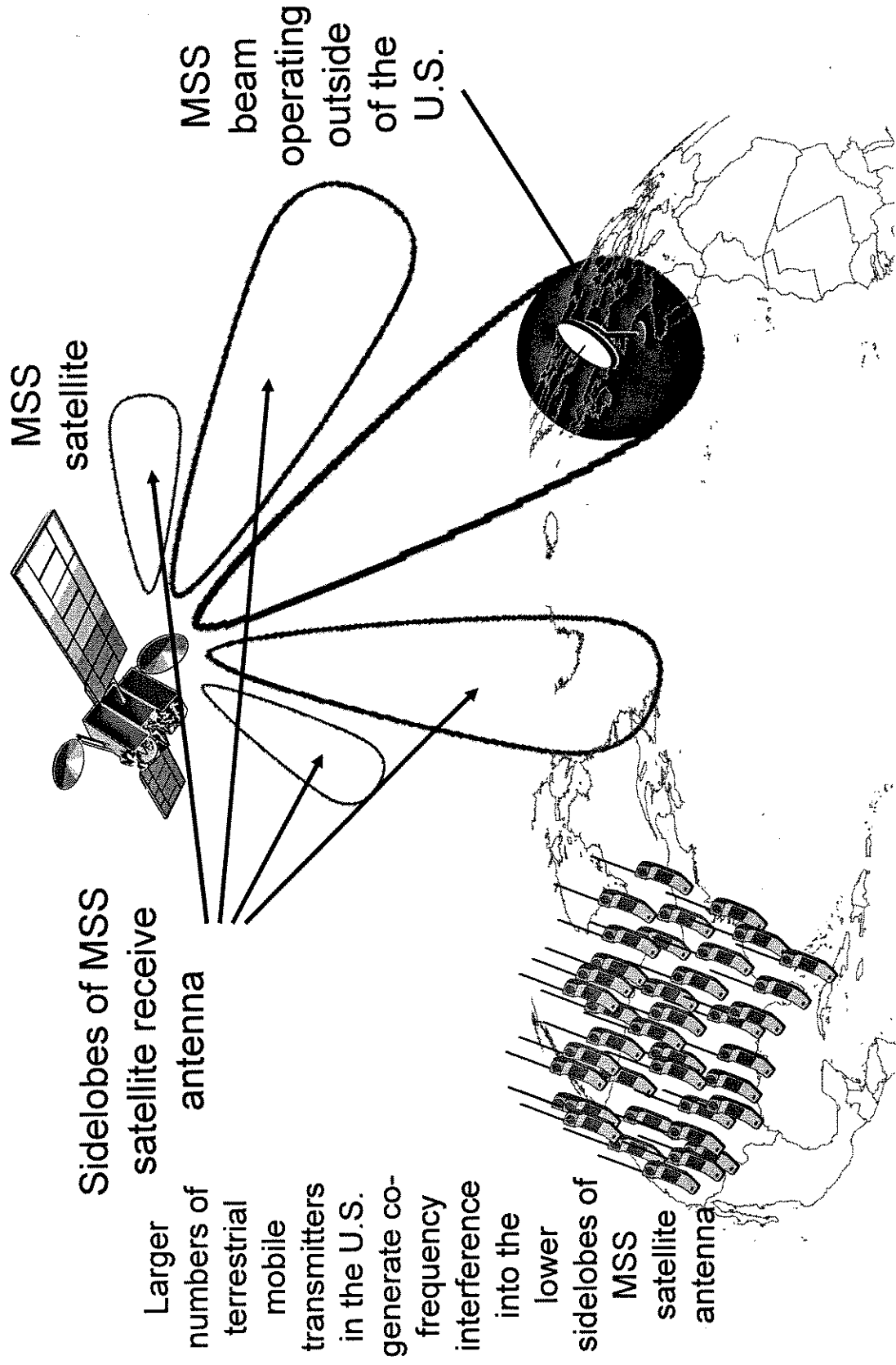
**Illustration of MSS Satellite Beam**



# Uplink Interference from Terrestrial Transmitters (Co-Frequency, Non Co-Coverage, Close Beam)



# Uplink Interference from Terrestrial Transmitters (Co-Frequency, Non Co-Coverage, Distant Beam)



**EXHIBIT B**

**Identification of Shared Bands**

Table I-1 attached hereto summarizes the current uses, as of January 13, 2006, of band segments in the L-Band uplink frequency range used by Inmarsat, MSV, and other L-Band operators authorized by the Administrations of Mexico, Russia, Japan, Australia, and Indonesia. Table I-1 includes updates refining certain uses identified in the table filed with Inmarsat's Opposition. This table is a snapshot of the current use of the bands. Inmarsat emphasizes that the spectrum usage identified in the attached table remains subject to change within the constraints of the interference protection criteria and spectrum reuse matrices agreed between Inmarsat and MSV (and between other operators), and within the constraints of the spectrum uses being made by other operators, as such changes have occurred over the course of the past six years, during which there has been no spectrum sharing agreement under the Mexico City MOU. As Inmarsat has previously explained, Inmarsat intends to serve the United States from its new I-4 spacecraft over the very same portions of the L-Band that Inmarsat has been using to serve the United States, and using the same interference protection criteria under which it has coexisted with MSV for years.<sup>1</sup>

The updated table still illustrates that MSV overstates the amount of spectrum in Table 1 of MSV's 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 downlink frequencies are shown as a series of contiguous band segments in each row of the table. The uplink frequencies used by each operator are assumed to match its downlink frequencies, except in a very small number of identified 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)  
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)

Certain spectrum bands are used by L-Band carriers in only the uplink or the downlink direction, respectively. These uses are indicated in the appropriate column by "F" for bands that are used

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<sup>1</sup> Inmarsat-4 was brought into service at 53° W.L. last month.

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by the carrier only in the forward direction and by “R” for bands that are used only in the return direction.

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.

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.

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**[TABLE I-1 REDACTED]**

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**EXHIBIT C**

**Derivation of  $\Delta T/T$  From Results of [REDACTED]**

**[REDACTED]**

**EXHIBIT D**

**Technical Annex**

**1. 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**

MSV's latest response on this issue is a vain attempt to find a way to overcome the problem highlighted by Inmarsat in its January 13, 2006 Opposition concerning the interference path from the transmitting ATC base stations into the Inmarsat satellite receivers at low elevation angles. MSV makes the following argument, which is fundamentally flawed.

MSV argues that the propagation path from the ATC base station towards the low-elevation satellite will be subject to the same conditions as from a user terminal to a satellite. To support this claim, MSV makes reference to the propagation modeling referred to by the Commission in its 2003 *ATC Order*, which is given in the well known publication entitled "Handbook of Propagation Effects for Vehicular and Personal Mobile Satellite Systems" (Vogel et al). The referenced propagation model is devoted to quantifying the propagation effects *between the user on the ground and the satellite*. The model is completely inapplicable to the situation of the link between a *base station and a satellite*. Base stations, by their very nature, are located in positions to give them the best possible coverage to their user population, and this means they are almost exclusively located in high positions, such as the roofs of buildings or other structures, or on naturally high ground such as hills. From these positions there will in most cases be a clear line-of-sight to the satellite with almost none of the obstructions that occur in the signal path between a user and the satellite. Therefore, MSV's suggestion that there is somehow 14.4 dB additional signal blockage between the ATC base station and a low-elevation Inmarsat satellite, relative to the situation for a high elevation satellite is completely wrong. In practice, there is very likely to be a negligible difference between these two cases for the majority of the base station locations, and likely zero signal attenuation due to obstruction in either case.

MSV also discussed the ground reflected signal. However, as MSV itself points out, in the case of satellites at low elevation angles, the direct component is the dominant source of interference.

Based on the above, the total aggregate discrimination to the low elevation Inmarsat satellite from the ensemble of ATC base stations in CONUS would be in the range 1 to 7 dB, and not 21.4 dB as claimed by MSV.<sup>1</sup>

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<sup>1</sup> The range 1 to 7 dB is based on the following contributions:

- (i) 1 dB for the additional slant range to the low elevation versus high elevation Inmarsat satellite;
- (ii) Between 0 and 3 dB to account for the fact that not all ATC base stations may be visible to the low elevation Inmarsat satellites;

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Therefore, Inmarsat's concerns raised in its January 13 Opposition are still valid and have not been adequately addressed by MSV. This interference mechanism between the ATC base stations and the low elevation Inmarsat satellites is a serious problem that must be addressed by the Commission and by MSV before TDD deployment in shared spectrum can be considered.

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

MSV has failed to respond to Inmarsat's concern on the interference impact of TDD-mode ATC terminals in any meaningful way. The only responsive point made by MSV is the observation that a single ATC terminal will only be transmitting for 50% of the time (assuming symmetrical receive-transmit times in the TDD system). This gives a maximum of 3 dB of reduction in the time-averaged interference. All of MSV's other arguments are either irrelevant, or the same, old arguments made in the past concerning MSV's view of where Inmarsat should be allowed to provide MSS service in the United States, or MSV's view of what the overload protection level should be (rather than what it actually is) for the Inmarsat terminals.

Therefore, MSV still has not met its burden to demonstrate that TDD-based ATC operations would produce no greater interference than the ATC rules permit.

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(iii) Between 0 and 3 dB to account for the possible reduction in EIRP towards the Inmarsat satellite relative to the peak EIRP of the ATC base station due to base station antenna discrimination (considering that MSV is intending to operate its base station with negligible down-tilt).



**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.

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

Richard J. Barnett, PhD, BSc

Telecomm Strategies, Inc.  
6404 Highland Drive  
Chevy Chase, Maryland 20815  
(301) 656-8969

Dated: February 7, 2006

## CERTIFICATE OF SERVICE

I, Jennifer Bruyere, hereby certify that on this 7<sup>th</sup> day of February 2006, served a true copy of the foregoing Reply of Inmarsat Ventures Limited by first class mail, postage pre-paid (or as otherwise indicated) upon the following:

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