

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

In the Matter of	)	
	)	
Amendment of Part 101 of the Commission's	)	WT Docket No. 07-54
Rules to Modify Antenna Requirement for	)	RM-11043
the 10.7-11.7 GHz Band	)	
	)	

**REPLY COMMENTS OF  
MOBILE SATELLITE VENTURES SUBSIDIARY LLC**

Mobile Satellite Ventures Subsidiary LLC (“MSV”), by its attorneys, submits the following reply comments in the above-captioned proceeding in which the Commission proposes to modify its rules to permit the installation of smaller antennas by Fixed Service (“FS”) operators in the 10.7-11.7 GHz band (the “11 GHz band”), a band that is shared with the Fixed Satellite Service (“FSS”).<sup>1/</sup> Based on very recent efforts to identify sites for its new feederlink earth stations, MSV is increasingly concerned that its critical feederlink operations, which are highly sensitive to interference, will cost in excess of \$100 million to construct, and need to be in the 11 GHz band, will be subject to unacceptable and harmful interference from the proliferation of new microwave operations expected as the result of any change in the rules. MSV’s concern is heightened by importance of the public safety communications that rely on these satellite links. To protect against this potential for harmful interference, MSV is proposing the adoption of specific limits and procedures that are tailored as narrowly as possible to have minimal impact, if any, on microwave deployment, but will provide greater certainty of protection for

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<sup>1/</sup> See *Notice of Proposed Rulemaking*, FCC 07-38, WT Docket No. 07-54 (adopted March 22, 2007) (“*NPRM*”). Reply comments in this proceeding were originally due June 11, 2007 but that date was extended by the Commission to June 21, 2007. See 72 Federal Register, No. 79 at 20494; *Order*, DA 07-2425, WT Docket 07-54 (June 8, 2007).

satellite communications. MSV also opposes Intelsat's proposed band segmentation to the extent such segmentation would prevent MSV's operation in the 11 GHz band or create further risk of interference to its operations.

### **Background**

For almost 20 years, MSV has been licensed to operate the feeder links for its Mobile Satellite Service ("MSS") system in the 11/13 GHz bands (10.7-10.95 GHz/11.2-11.45 GHz and 12.75-13.25 GHz).<sup>2/</sup> The Commission waived Footnote NG104, which limits the use of these frequencies for international satellite systems based on its expectation that there would be few MSS feederlink earth stations and that those few could successfully coordinate with Fixed Service users in the band. The Commission stated that coordination between MSS feederlink earth stations and FS operators would be pursuant to Section 25.203 of the Commission's Rules, which requires prospective applicants to provide interference protection to previously licensed or applied for facilities.<sup>3</sup>

Today, MSV operates two feederlink earth stations in the United States (in Reston, VA and a back-up in Alexandria, VA) and one in Canada. MSV uses the earth stations to offer a full range of mobile satellite services, including voice and data, using both its own United States-licensed satellite and the Canadian-licensed L band satellite.<sup>4</sup> MSV provides two-way radio (PTT) and mobile data services to federal, state and local agencies involved in public safety and

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<sup>2/</sup> *Order and Authorization*, 4 FCC Rcd 6041 (1989); *remanded by Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428 (D.C. Cir. 1991); *Final Decision on Remand*, 7 FCC Rcd 266 (1992); *aff'd, Aeronautical Radio, Inc. v. FCC*, 983 F.2d 275 (D.C. Cir. 1993); *see also AMSC Subsidiary Corporation, Memorandum Opinion and Order*, 8 FCC Rcd 4040 (1993).

<sup>3</sup> *Id.* At para. 71. The Commission added that a waiver would also allow MSV to use the same frequency band for feeder links as the Canadian MSS system, "fostering intergovernmental cooperation in implementing this new service." *Id.* At para. 70.

<sup>4</sup> The Canadian-licensed satellite also uses frequencies in the 11/13 GHz bands for feederlink operations.

emergency response operations. These include, among others, the Federal Emergency Management Agency, U.S. Coast Guard, and local fire and police departments. These public safety entities and first responders depend on MSV's system for redundant and ubiquitous wireless services during daily operations and in the case of emergencies.

In May 2005, the Bureau licensed MSV to launch and operate a replacement L band MSS satellite.<sup>5/</sup> Industry Canada has authorized MSV Canada to launch and operate a similar next-generation L band MSS satellite.<sup>6/</sup> As with the current-generation satellites, both of these satellites are authorized to use frequencies in the 11/13 GHz bands for feeder link operations. MSV is ahead of the Commission's milestone schedule and on June 15, 2007 informed the Commission that it had met, 11 months ahead of schedule, its milestone for beginning construction of MSV-1.<sup>7/</sup> The new satellites, being built by Boeing, represent a huge increase in satellite power, making possible two-way broadband communications with small, lightweight, handheld user devices no bigger than today's cellphones. MSV expects that public safety organizations will continue to be major customers of the next generation system.<sup>8/</sup>

In order to be fully operational in 2009, MSV has begun the process of contracting for sites for four new feeder link earth stations that will be needed to support its next generation

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<sup>5/</sup> See *Mobile Satellite Ventures Subsidiary LLC, Order and Authorization*, DA 05-1492 (May 23, 2005) ("MSV-1 Order").

<sup>6/</sup> See Letter from Jan Skora, Director General, Radiocommunications and Broadcasting Regulatory Branch, Industry Canada, to Mr. Larry Boisvert, President, Mobile Satellite Ventures (Canada) Inc., File No. 6215-3-3 (April 5, 2005).

<sup>7/</sup> See Letter from Jennifer A. Manner, Vice President, Regulatory Affairs, Mobile Satellite Ventures LP, File No. SAT-LOA-19980702-00066 (June 15, 2007).

<sup>8/</sup> MSV has supported a requirement in the 700 MHz proceeding that all 700 MHz public safety user equipment incorporate satellite capability. See Comments of Mobile Satellite Ventures Subsidiary LLC, WT Docket 06-150 (May 23, 2007). Satellites are uniquely capable of providing broadband coverage nationwide and of remaining in operation regardless of local disasters. MSV has demonstrated that satellite capability can be added to public safety user devices at a cost of less than \$5 and with no impact on size.

system. At least two of these earth stations will be located in the United States, the others will be in Canada. Each of these earth stations will cost in excess of \$25 million to construct.

Incorporated into these earth stations (and next-generation satellites) is state-of-the-art Ground-Based Beam Forming (“GBBF”) technology that will enable communications to user terminals comparable in size to today’s cell phones. However, this GBBF technology also requires a significant amount of feeder link spectrum.<sup>9</sup> In order to provide the required amount of aggregate feederlink bandwidth, MSV’s system design requires four satellite earth stations. As such, MSV’s investment into the earth station elements will exceed \$100 million. The use of small user terminals and GBBF technology also makes the MSV feeder links very susceptible to interference from external sources. Further complicating MSV’s earth station selection process is the fact that the specific location of the earth stations affects the satellite design and, once the earth station sites have been selected and the satellite design finalized, the earth station effectively cannot be relocated for the life of the satellite.<sup>10</sup>

The initial site selection process has highlighted the potential for interference problems in the future, despite the existing coordination rules. Working with Comsearch, MSV recently had to eliminate a prime potential site because of the proliferation of 11 GHz microwave licensees operating in the vicinity of the existing satellite teleport locations. In some cases, the interference was caused by a single microwave path, while in other cases it was the aggregation of two or three microwave paths that put the interference above an acceptable threshold. MSV is optimistic that it will find other, acceptable teleport sites, but the concern remains that a

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<sup>9</sup> The MSV Next-generation design requires approximately 4 GHz of aggregate feederlink bandwidth to support the GBBF technology and the 450-500 L band spot beams that this technology will permit.

<sup>10</sup> In particular, each of the satellite’s feederlink antennas will be directionally aligned to the selected earth station locations – and these antenna directions can not be changed once the satellites have been constructed and launched.

substantial increase in microwave deployments in the vicinity of the selected earth station sites would be much more problematic than previously understood to be the case.

MSV, Intelsat Ltd., and Union Telephone Company all expressed concerns about adoption of the proposal to allow smaller microwave dishes to operate in the 11 GHz band. Each was worried that the proliferation of more microwave licensees may have a detrimental impact on existing operations. Although MSV had not yet conducted the research that forced it to eliminate one potential site, it did not oppose the rule change if the new coordination requirement was also adopted. Intelsat argued for rejection of the proposal on the grounds that Fibertower had not provided any engineering analysis to demonstrate conclusively that the newly-licensed stations will not cause harmful interference to existing, licensed services.<sup>11</sup> Alternatively, Intelsat recommended segmenting the bands so for future stations, the unplanned bands 10.95-11.2 GHz and 11.45-11.7 GHz (in which Intelsat operates) would be dedicated to FSS use and the planned bands, 10-7-10.95 GHz and 11.2-11.45 GHz, used by MSV, would be dedicated to FS use. *Id.* At 7. Union Telephone said that it needs to operate in the 11 GHz band to accommodate high capacity and longer path lengths required for its rural telephone operations. It recommended that if the new rule is adopted, the FCC also adopt limitations on the applications that could be served with the smaller antennas, including limits on path lengths, reduced EIRPs or use only in urban areas.<sup>12</sup>

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<sup>11</sup> Comments of Intelsat, Ltd., WT Docket 07-54 at 5.

<sup>12</sup> Comments of Union Telephone Company, WT Docket 07-54 at 4.

## Discussion

### **I. The Introduction of Power Limits for New FS Licensees in the 11 GHz Band Will Help Prevent an Interference Problem**

MSV proposes a minor change to the Commission's rules that will resolve potential interference problems between new microwave licensees in the 11 GHz band and the limited number of FSS licensees that will use the band to support feeder links for geostationary MSS systems. The MSV proposal will permit the unlimited licensing of new 11 GHz microwave facilities, whether large or small, in all areas except those very few close to an MSS feederlink earth station. In those handful of geographic areas that are close to such an earth station, a proposed new microwave site installation will be permitted in the band if it meets certain fairly relaxed limits outside the feederlink portion of the band or more stringent limits inside that portion of the band. By codifying specific limits in the rules, any uncertainty present in the current coordination procedures will be eliminated. As an initial matter, the determination of whether a path meets these limits will be done using a standard predictive analysis. As a failsafe, the earth station licensee would be entitled to later take measurements to determine the actual interference levels produced by the microwave station.

More specifically, MSV proposes the following addition to the existing Part 101 rules:

#### 101.115(g) Additional Protection for GSO MSS feederlink earth stations

(i) Notwithstanding the coordination requirements of Section 101.115(f), an application for a new station will be permitted in the same market as a Fixed Satellite Service earth station licensed to communicate with a GSO Mobile Satellite Service satellite only if it can demonstrate that its operations (either alone or in aggregate with other co-frequency operations) will not exceed the following limits:

(a) -162 dBW/MHz in any part of the 10.7-10.95 GHz or 11.2-11.45 GHz bands and

(b) -125 dBW/MHz in any part of the 10.95-11.2 GHz or 11.45-11.7 GHz bands.

(ii) The applicant's calculation of received signal power shall be based on a predictive analysis that is consistent with ITU-R SF.1006 and must take into consideration the aggregate interference from all co-frequency terrestrial interference sources at the output of the earth station antenna, taking into account the earth station antenna reference gain mask as defined in Part 25.209 of the Commission's Rules.

(iii) Once a new station is operational, the licensee of an MSS feeder link earth station is entitled to take field measurements to determine whether the operations of one or more Fixed station are or will exceed the prescribed power limits, in which case the responsible Fixed station licensees will be required to reduce its transmit power levels, or cease operations on those frequencies. To facilitate such field tests, Fixed station licensees are required to cooperate with the MSS feeder link earth station licensees in providing information regarding their operations. The field measurements shall be considered valid if proponent certifies that they were performed with a calibrated spectrum analyzer, a gain calibrated antenna, low noise amplifiers, and low loss cables, using standard procedures established by the National Spectrum Managers Association.

We propose the in-band limit of -162 dBW/MHz based on input from both SED (MSV's earth station integrator) regarding the interference threshold for MSV's satellite earth station and from Comsearch regarding the historic reliability of its predictive analysis. MSV's analysis of data provided by SED indicates that protection to at least -159 dBW/MHz will ensure adequate feederlink operating margin. MSV has also factored in a 3 dB margin into the -162 dBW/MHz threshold to accommodate inaccuracies in the predicted interference level, based on Comsearch indicating that its predictive analysis may, in a small percentage of cases, underestimate the true interference levels by as much as 3 dB. We also propose the out-of-band limit of -125 dBW/MHz based on our analysis of the potential for harmful interference from front-end overload to our satellite earth station receivers, and the resultant desensitization of our earth station low-noise amplifiers and associated inter-modulation effects. The ITU-R standard referenced is the one Comsearch indicates it uses for its coordination.

These proposed limits should not unduly burden fixed microwave operations. The limit applies only to new fixed station licensees and will have no impact on their existing operations.

The geographic scope of the new limits is quite small, affecting potential microwave licensees in no more than a very few markets.<sup>13</sup> In those few markets, many prospective microwave paths can be expected to meet the limits and, in those few cases where use of the planned bands is problematic, use of other 11 GHz frequencies should be acceptable.

As discussed above, MSV proposes these limits out of an abundance of caution because of the extraordinary sensitivity to interference of its new feederlink earth stations, the enormous investment that it must make in those facilities, its inability to relocate the facilities once their location has been set, and – most important – the critical nature of the communications using its system. These seem reasonable precautions for the Commission to take in light of their insignificant impact on microwave operations.

## **II. The Commission Should Reject Intelsat’s Proposed Band Segmentation Plan**

Intelsat’s proposed band segmentation plan would require all new FS licensees to be limited to half of the 11 GHz band and, as a result, would put substantial pressure on new FS deployments in markets where MSV operates feederlink earth stations. Unlike Intelsat, which operates its earth stations in several bands, MSV is only authorized to operate its feeder link earth stations in the 11 and 13 GHz bands. With its current satellites operational and its new satellites under construction, MSV cannot shift to the portion of the 11 GHz band that Intelsat is promoting for satellite-only use. Intelsat’s proposal, therefore, would exacerbate the potential for interference to MSV at the expense of its customers, including many public safety and government users.

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<sup>13</sup> In addition to MSV’s existing and planned earth stations, TerreStar Networks Inc. has applied to operate an 11 GHz feeder link earth station in Las Vegas. SES-LIC-20070530-00732.

## Conclusion

MSV requests that the Commission act in accordance with the recommendations made herein.

Respectfully submitted,

/s/ Jennifer A. Manner

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## Technical Certification

I, William W. Chapman, Ph.D., Program Director, Next Generation Systems Engineering, Mobile Satellite Ventures, LP, hereby certify that I have reviewed the foregoing **REPLY COMMENTS OF MOBILE SATELLITE VENTURES SUBSIDIARY LLC** and that the facts and technical statements made herein are true and correct to the best of my knowledge and belief.

/s/William W. Chapman, Ph.D  
William W. Chapman

June 21, 2007