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FILED ELECTRONICALLY

July 20, 2015

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

Re: Opposition to Intelsat Informal Objection Under Section 5.95 to Application of Space Exploration Technologies Corp. for Experimental License for the MicroSat-1a/b Test and Demonstration Mission, File No. 0356-EX-PL-2015

Space Exploration Technologies Corp. ("SpaceX"), by its undersigned counsel and representative, hereby opposes the "informal objection" filed electronically pursuant to Section 5.95 of the Federal Communications Commission ("Commission") rules on July 9, 2015 by Intelsat License LLC ("Intelsat") to SpaceX's application for an Experimental License for the MicroSat 1-a/b Test and Demonstration Mission. SpaceX is a U.S. space technology company headquartered in California, with additional launch and test facilities in Florida and Texas, and a commercial satellite development center in Washington State.

SpaceX plans to deploy a large constellation of small satellites for low-latency, worldwide, high-capacity Internet service. As a developmental step towards this initiative, SpaceX intends to experiment with 6-8 test and demonstration satellites starting in 2016. As explained in SpaceX's application, these are prototype engineering verification vehicles that will enable in-space performance assessment and rapid iteration of technologies. The first physical instantiation will be two satellites: MicroSat-1a and MicroSat-1b. To that end, SpaceX filed an application for an experimental license for the MicroSat-1a and MicroSat-1b test and demonstration mission on May 29, 2015.[1]

[1] Application of Space Exploration Technologies Corp. to Request an Experimental License for the MicroSat-1a/b Test and Demonstration Mission, File No. 0356-EX-PL-2015 (filed May. 29, 2015).

I. Overview of Intelsat Arguments

In its letter to the Commission, Intelsat claims that SpaceX: (1) has "failed to meet its burden of showing how it could operate on a non-interference basis to Ku- or X-band satellites in the geostationary arc;" and (2) "has not shown how it could meet its collision avoidance and coordination responsibilities."[2] Here it should be noted that Intelsat has invested in and entered into a "strategic alliance" with OneWeb, an announced competitor to SpaceX's NGSO system.[3]

SpaceX demonstrates below that Intelsat's assertions are incorrect. SpaceX also requests below that the Commission modify the *ex parte* status of this proceeding from "restricted" to "permit-but-disclose."

Notably, Intelsat makes only *two* discrete arguments with respect to the MicroSat-1a/b application relating to interference and collision risks, but requests that the Commission release *all* exhibits associated with the application. Although SpaceX disagrees with Intelsat's assertions, SpaceX is providing additional information in an expanded and publically available Exhibit 2 to address Intelsat's contention regarding potential radio interference. With respect to Intelsat's other argument, SpaceX already has demonstrated in its Exhibit 7, which is publically available, that it will satisfy the Commission's collision avoidance requirements.[4]

Intelsat asserts in its letter that SpaceX is "withholding critical technical information from interested parties" and therefore requests that the FCC deny the MicroSat-1a/b application "until such time as SpaceX includes sufficient information" to avoid interference or collision with geostationary satellites.[5] Intelsat's assertion of withholding critical information is moot with respect to its claims of potential interference, because there is now a public version of Exhibit 2 that provides the requisite technical information regarding interference. Intelsat's assertion of withholding critical information is baseless with respect to its claims of the possibility for collisions, because Exhibit 7, which already was public, provides the requisite technical information regarding interference regarding collisions.

II. Intelsat's Interference Arguments Should be Rejected

In its letter to the Commission, Intelsat claims that it must have access to several additional parameters in order to fully understand interference potential, including beam width, off-axis gain, number of antennas, etc. SpaceX disagrees with this characterization; however, in the interests of facilitating the Commission's review of the MicroSat-1a/b application, SpaceX is providing additional information in an expanded and publically available Exhibit 2.

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[2] Susan H. Crandall, Associate General Counsel, Intelsat Corporation. Letter to Marlene H. Dortch, Secretary, Federal Communications Commission. "Informal Objection Under Section 5.95 to Application of Space Exploration Technologies Corp. ("SpaceX"), Application for Experimental License for the MicroSat-1a/b Test and Demonstration Mission, File No.0356-EX-PL-2015" (filed July 9, 2015).

[3] Press Release. Intelsat Corporation. "Intelsat Enters Strategic Alliance with OneWeb Low Earth Orbit Venture for Complementary Global Satellite-Based Solutions." (June 2015). Available at:http://www.intelsat.com/news/intelsat-enters-strategic-alliance-with-oneweb-low-earth-orbit-venture-for-complementary-global-satellite-based-solutions/

[4] Intelsat must be aware of this exhibit, since it refers to it in its letter to the Commission, in footnote 8.

[5] In connection with this assertion, Intelsat has filed a Freedom of Information Act request relating to the MicroSat-1a/b application. SpaceX will respond to this request at the appropriate time.

As shown in the public version of Exhibit 2, SpaceX's MicroSat system will protect GSO satellites by shutting off transmissions within 12 degrees of the geostationary orbit and adjusting the transmit power as appropriate from its satellites and earth stations. This version of Exhibit 2 contains all of the information Intelsat claims it needs with respect to potential interference and demonstrates that GSO satellites will be protected.

Intelsat argues that it must understand "beam parameters" in order to analyze potential interference without assuming worst case parameters. As above, SpaceX is providing information through the expanded and publically available Exhibit 2 which contains information on PFD and interference analyses to demonstrate that SpaceX is in compliance with regulations meant to eliminate the risk of interference.

Intelsat also has claimed that it must have greater detail on orbital parameters in order to identify a SpaceX transmission as the cause of any interference detected by an Intelsat earth station in the future, and to ensure that the FCC can take proper action to stop SpaceX from interfering with Intelsat in such a scenario. Here, the orbital parameters are given in the publicly-available Form 442 as a 625 km circular orbit at 86.6° inclination. With respect to right ascension, this will be determined based on the actual time of launch, as is standard for low earth orbit systems. Once the satellites are launched, NORAD tracks every satellite and publically publishes Two-Line Element Sets (TLE) twice a day, showing the exact location of the satellites. Because the MicroSat satellites are non-propulsive, there is no additional data available beyond what will be publicly available.

III. Intelsat's Collision Arguments Should be Rejected

In addition to its assertions about potential interference, Intelsat makes arguments with respect to the possibility of a collision with its geostationary satellites. Specifically, Intelsat notes that, pursuant to Section 5.64(b)(3) of the FCC rules, operators of experimental satellites must "include an analysis of the potential risk of collision and a description of what measures the space station operator plans to avoid in-orbit collisions."[6] Intelsat then asserts that SpaceX has not filed this information in the public record. Intelsat's arguments relate to its Launch and Early Operations Phase ("LEOP") service, which it provides for itself as well as for operators of other satellites.

SpaceX agrees that the Commission's rules require operators of experimental satellites to include analyses associated with collision risks. This information, however, has been submitted in the publicly-available Exhibit 7 In the MicroSat-1a/b application. The collision risk analysis in Exhibit 7 (page 6) includes all of the elements required by Section 5.64(b)(3) of the rules.[7] As stated in Exhibit 7, the MicroSat system has an especially low risk of collision because it utilizes an orbit (625 km, 86.6°) with no other satellite systems and it has a relatively limited orbital lifetime (less than 10 years). SpaceX provided calculations in Exhibit 7 documenting that the chances of a collision are remote and within acceptable limits. As a result, Intelsat's objection with respect to collision risks is meritless.

Finally, Intelsat's filing expresses concerns, which are also baseless, regarding its LEOP operations. First, these LEOP satellites have yet to be launched. Second, LEOP is a short-duration phase at a different orbital inclination than those of MicroSat-1a/b. This specific orbital relative orientation, by simple mathematical calculation, results in the *lowest and most negligible non-zero collision risk possible*, with probabilities on an order of less than 1 in 1 quadrillion.

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[6] 47 C.F.R. § 5.64(b)(3).

[7] SpaceX is compliant pursuant to NASA Technical Standard 8719.14, *Process for Limiting Orbital Debris*. NASA-STD-8719.14A (with Change 1). Approved: 2011-12-08. Change 1 approved: 2012-05-25.

IV. This Proceeding Should Be Classified As Permit But Disclose

At present, the proceeding relating to the above-referenced application is classified as "restricted" under the Commission's *ex parte* rules.[8] But "the Commission and its staff retain the discretion to modify the applicable *ex parte* rules" in cases in which "the public interest so requires."[9]

Pursuant to Sections 1.1200(a), 1.1206, and 1.1208 note 2 of the Commission's rules,[10] SpaceX hereby requests that the Commission modify the *ex parte* status of this proceeding from "restricted" to "permit-but-disclose" so that SpaceX and other interested parties may communicate directly with Commission staff, subject to the disclosure rules for permit-but-disclose proceedings. There is ample precedent for reclassifying satellite application proceedings as permit-but-disclose.[11] The issues in this matter, moreover, are technical in nature, and permit but disclose classification will facilitate a complete airing of the considerations at play. Establishing a better record on which the Commission can base its decision is unquestionably in the public interest.

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In light of the foregoing, the Commission should reject Intelsat's "informal objection" with respect to SpaceX's MicroSat-1a/b experimental application. The Commission has actively sought to ensure that its experimental rules are in line with the advancement of new technologies and innovation to better serve consumers, particularly regarding new entrants into the marketplace.[12] Given that SpaceX is,

[8] *See* 47 C.F.R. § 1.1208. The proceeding relating to the separate Freedom of Information Act request filed by Intelsat, on the other hand, is classified as permit but disclose. *See* 47 C.F.R. § 0.461(d)(3), note to paragraph (d)(3).
[9] 47 C.F.R. §§ 1.1200(a).
[10] 47 C.F.R. § 1.1200(a).
[11] *See, e.g.,* Public Notice, "Policy Branch Information, Actions Taken," Report No. SAT-01091, DA 15-963 (June 12, 2015) (reclassifying an application filed by Intelsat as "permit but disclose"); *In the Matter of New ICO Satellite Services G.P., Motion to Designate Proceeding as "Permit-but-Disclose,"* File No. SAT-MOD-20061109-00137, Grant Stamp of Motion to Designate Proceeding as "Permit-But-Disclose" (Nov. 16, 2006); Public Notice, "Satellite Communications Services," Rep. No. SES-00590, March 25, 2004 (modifying *ex parte* status of DIRECTV Enterprises LLC blanket earth station application); Public Notice, Rep. No. SAT-00125 (Oct. 30, 2002) (modifying *ex parte* status for ICO and Lockheed Martin satellite application proceedings); Public Notice, "International Bureau Satellite Policy Branch Information: Echo Star Satellite Company Application for Authority to Make Minor Modifications to Direct Broadcast Satellite Authorization, Launch and Operational Authority," Rep. No. SPB-159, DA 00-1630 (July 21, 2000).
[12] Federal Communications Commission. Order and Report, "Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules." ET Docket No. 10-236 (Adopted January 31, 2013).

in good faith, providing Intelsat and the general public with additional information (beyond what is typically required) to facilitate its analysis with regard to potential interference, and given that SpaceX had previously made public its Exhibit 7 regarding collision risks, Intelsat's objection to this experiment should be denied and the SpaceX application for experimental license should be granted without further delay.

Respectfully submitted,

/s/ Henry Goldberg
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