GETSAT MILLIEX AND KA5000 MODIFICATION NARRATIVE

Exhibit A
Narrative

I. DESCRIPTION OF MODIFICATION

ISAT US, Inc. ("Inmarsat") hereby seeks to modify its blanket earth station license, Call Sign E140114, to add two new earth station in motion aboard aircraft terminals ("GetSat MilliEX" and "KA5000") to provide mobile communications services over Inmarsat's Global Xpress Ka-band satellite system. ISAT US already holds a blanket license for three aeronautical earth stations in motion (ESIMs) terminals that communicate with the Inmarsat 5F1, Inmarsat 5F2, and Inmarsat 5F3 satellite networks, see Call Sign E140114, File No. SES-LIC-20141030-00832 ("GX Aero Application") (as modified by File Nos. SES-MFS-20150923-00605, SES-MOD-20160302-00191, SES-MOD-20171010-01126, and SES-MFS-20180112-00020). The E140114 license covers operations in the 29.5-30.0 GHz (Earth-to-space) and 19.7-20.2 GHz (space-to-Earth) frequency bands.

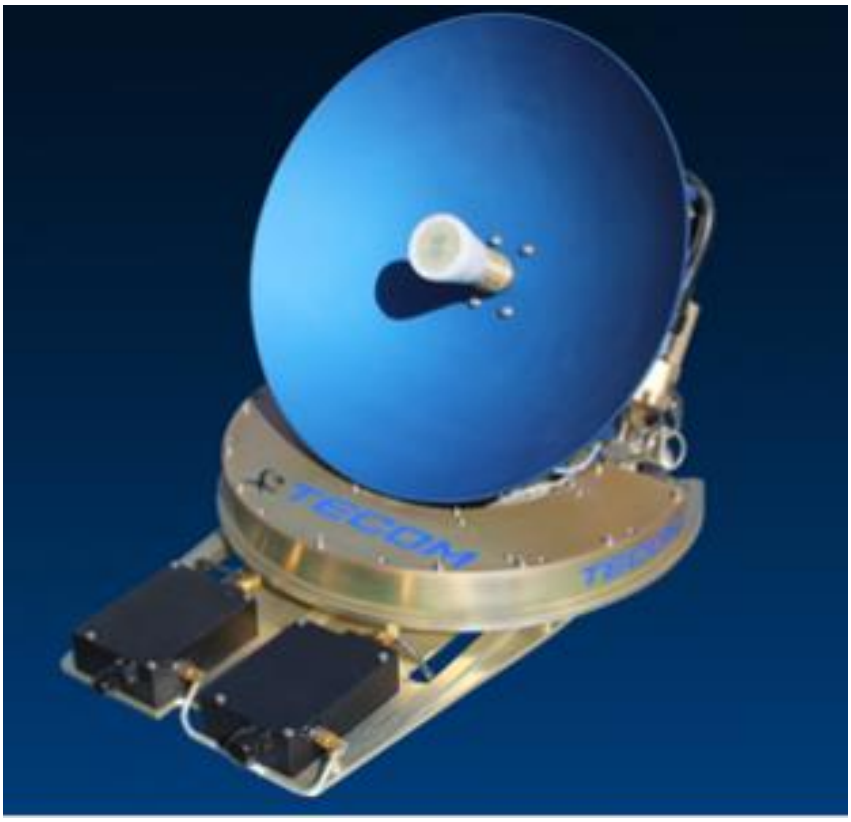
II. NEW TERMINALS

The authorization of the two new terminals is requested to satisfy the operational needs of Inmarsat's US Government customers to meet the demands of high-performance applications. The information provided in the underlying application for Call Sign E140114 (and its associated amendments referenced in the preceding paragraph) regarding the Global Xpress satellite system, the sections regarding additional capabilities and commitments (including that ISAT US will maintain a point of contact in the U.S. available on a 24/7 basis), and the discussion supporting the request for waiver of the table of frequency allocation are incorporated by reference,

consistent with Section 25.130(c) of the Commission's rules. Additionally, ISAT US incorporates by reference Exhibit D and of the GX Aero Application addressing Questions 36.

A. KA5000

The proposed KA5000 aero terminal earth station employs a 30cm diameter circular antenna and will communicate with the U.K.-licensed Inmarsat 5F1 ("I5F1"), Inmarsat 5F2 ("I5F2") and Inmarsat 5F3 ("I5F3") satellite networks. The half-power beamwidth required to be stated by Section 25.115(a)(9) is 2.5 degrees. The required technical data for the proposed KA5000 earth station is provided in the Form 312. For blanket licensing of transmitting Earth stations in the 29.5-30.0 GHz band, the Commission adopted off-axis EIRP spectral density levels contained in Section 25.218(i). As illustrated in the off-axis EIRP spectral density plots in Exhibit B, the proposed terminal type meets the performance requirements in Section 25.218(i) under clear sky conditions. Designed for tail mounting, the KA5000 terminal is pictured below.



B. GetSat MilliEX

The proposed GetSat MilliEX aero terminal earth station employs a 48 cm x 20 cm flat panel antenna and will also communicate with the I5F1, I5F2, and I5F3 satellite networks. The required technical data for the proposed GetSat MilliEX aero terminal is provided in the Form 312. The half-power beamwidth required to be stated by Section 25.115(a)(9) is 1.5 degrees. For blanket licensing of transmitting Earth stations in the 29.5-30.0 GHz band, the Commission adopted off-axis EIRP spectral density levels contained in Section 25.218(i). As illustrated in the off-axis EIRP spectral density plots in Exhibit B, the proposed terminal type meets the performance requirements in Section 25.218(i) under clear sky conditions.

ISAT US hereby respectfully requests a partial waiver of Sections 25.115(g) and 25.132(b)(1) of the FCC's rules to the extent the antenna plots in Exhibit B of this application do not cover the entire range of off-axis angles called for in those rule sections. The relevant portions of Sections 25.115 and 25.132 call for plots of maximum co-polarized EIRP density in the plane tangent to the GSO arc at off-axis angles from minus 180° to plus 180°. Exhibit B of this application includes plots covering off-axis angles from minus 90° to plus 90°. These are the plots that were provided by the terminal manufacturer, and ISAT US was unable to receive plots covering the rest of the range called for in Sections 25.115 and 25.132 of the FCC's rules. The plots provided for each antenna show a sharp drop off in EIRP density at angles moving away from the GSO arc, and in each case show that by minus 50° or plus 50°, the EIRP densities are well below the envelope specified in Section 25.209 of the FCC's rules. This strong performance against the Section 25.209 envelope is in part a result of the small rectangular panel and tight beam-forming of the GetSat MilliEX terminal antennas. As a result of the terminal design, there is no reason to expect that that the EIRP density levels would dramatically increase

beyond minus 90° or plus 90°. Grant of this partial waiver will help accelerate the approval process of these terminals by not requiring unnecessary and duplicative measurements to be taken by the manufacturer, and thus would serve the public interest.

The GetSat MilliEX terminal is pictured without its radome below.

C. Applicable to Both Terminal Types

These terminals will be operated within the -118 dBW/m2/MHz power flux-density at the earth's surface of the I5F1, I5F2, and I5F3 satellites. Thus, the proposed terminal is able to operate without causing unacceptable interference, consistent with the requirements of Section 25.209(f).[1]

The Commission has deleted the requirement to provide receive earth station patterns in the 19.7-20.2 GHz frequency band (see Sections 25.132 and 25.115). To the extent that the

[1] *See* Section 25.209(f).

proposed terminals may have minor exceedance at certain off-axis angles, ISAT US understands and agrees to accept interference from adjacent FSS satellite networks to the extent the relevant receiving antenna performance requirements of Section 25.209 are exceeded.

The radiation hazard analyses for the GetSat MilliEX and KA5000 antennas and a discussion of the results are provided in Exhibit C.

The proposed GetSat MilliEX and KA5000 antennas will be subject to the same national security requirements as described in Exhibit A, Section 4, of the GX Aero Application. That discussion is also incorporated by reference herein.