

ISAT US Inc.
FCC Form 312 Exhibit A

Application to Modify License E140029

I. DESCRIPTION OF MODIFICATION

ISAT US Inc. (“ISAT US”) hereby seeks to modify its Global Xpress (GX) Ka-band blanket maritime ESIM license, Call Sign E140029 (“License”), File No. SES-LIC-20140224-00098 (“GX Maritime Application”), as modified in File Nos. SES-MOD-20151106-00818, SES-AFS-20160211-00130, SES-AFS-20160301-00178, SES-MOD-20161130-00917, SES-MOD-20170817-00928, and SES-MOD-20190321-00390. ISAT US requests addition of two new GX Earth station terminal types, Intellian GX100NX and JRC JUE-100NX (collectively, the “100NX Terminals”), which will communicate with the Inmarsat-5 F2 (“I5F2”) and Inmarsat-5 F3 (“I5F3”) satellites. Section II describes the proposed new Earth station terminals. No other changes are requested by this modification application.

ISAT US incorporates by reference the GX Maritime Application and the amendments captioned above.

II. NEW EARTH STATION TERMINALS

This modification application seeks to add two electrically equivalent terminal models that are manufactured by Intellian and JRC. These are the Intellian GX100NX and JRC JUE-100NX terminals, which both employ 1.05 meter antennae. The 100NX Terminals will operate on frequencies common to all other terminals authorized in the current license: 19.7-20.2 GHz (space-to-Earth) and 29.5-30.0 GHz (Earth-to-space). The terminals will operate on board maritime vessels in various sectors, including U.S. government, to quickly deploy and augment communication networks to meet mission needs.

A. Terminal Description

This application seeks to license the Intellian GX100NX and JRC JUE-100NX terminals. The terminals will operate on the 19.7-20.2 GHz (space-to-Earth) and 29.5-30.0 GHz (Earth-to-space) frequency bands, as authorized to all terminals currently on the GX Maritime License.

These terminals use the same RF chain and antenna design and are electrically equivalent. As illustrated in the off-axis EIRP spectral density plots in Exhibit B, the terminals meet the performance requirements in Section 25.209 under clear sky conditions. Additionally, each of these ESIM terminal types will be operated within the -118 dBW/m²/MHz power flux-density at the earth's surface of the I5F2 and I5F3 satellite. Thus, the proposed terminals are able to operate without causing unacceptable interference.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 proposed terminal may have minor exceedance at certain off-axis angles Inmarsat 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.

Radiation hazard analysis for the 100NX Terminals and a discussion of the results is provided in Exhibit C.

The proposed terminals will be subject to the same national security requirements described in Section 4 of the GX Maritime Application. That discussion is incorporated by

¹ See Section 25.209(f).

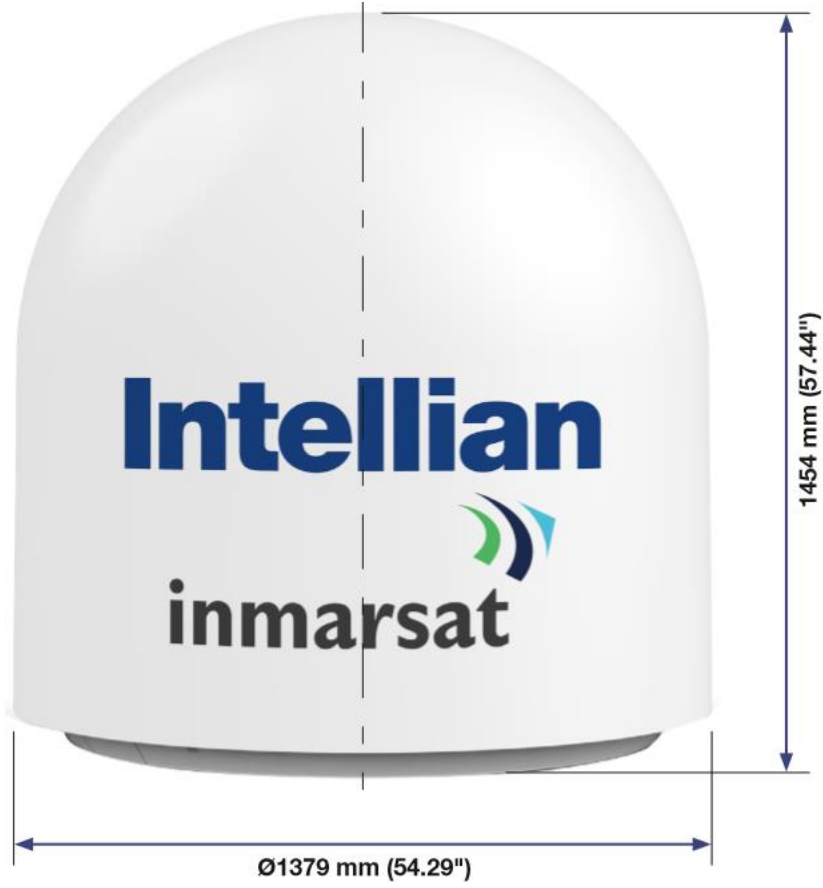
reference herein. Inmarsat has completed US334 coordination with the applicable federal users.

The following sections provide a description of each of the terminal types.

B. Intellian GX100NX Terminal

The required technical data for the proposed Intellian GX100NX earth station is provided in the Form 312. This terminal type employs a 1.05 meter antenna, and the half-power beamwidth required to be stated by Section 25.115(a)(9) is 0.9 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.

Below are images of the Intellian GX100NX terminal, both inside and outside its radome:



C. JRC JUE-100NX Terminal

The technical data for the JRC JUE-100NX earth station is provided in the Form 312. This terminal type employs a 1.05 meter antenna, and the half-power beamwidth required to be stated by Section 25.115(a)(9) is 0.9 degrees. The terminal is electrically equivalent to the Intellian GX100NX terminal described above, and the off-axis EIRP spectral density plots in Exhibit B are also applicable to the JRC JUE-100NX terminal. The proposed terminal type meets the performance requirements in Section 25.218(i) under clear sky conditions.

III. ESIM REMOTE CONTROL POINT, 24-HOUR POINT OF CONTACT

Both 100NX Terminals will operate in accordance with the applicable requirements for earth stations in motion as listed in Section 25.228. Both terminals comply with the newly adopted rule Sections 25.228(b) (self-monitoring) and 25.228(c) (network control and monitoring center). The terminals self-monitor and detect when there is a loss in the corresponding receive link. Upon detection of such loss of link, the terminal will immediately cease transmissions. This regulatory function is tested on each individual terminal during its first Over-the-Air Test.

Additionally, each individual terminal can be monitored and controlled through a “Hub” at Inmarsat’s Lino Lakes Gateway Earth station, call sign E120072. The network will not allow the terminal to transmit should the terminal violate any of the PSD or EIRP limits for the terminal; the Hub is aware of the terminal limitations as per terminal type, and the terminal will only transmit on those assigned slots/carriers the Hub instructs each terminal to use.

Finally, the terminals will comply with the conditions of ESV operations as stated in Section 25.228(e). ISAT US ESIM terminals are controlled through the Inmarsat Network Operations Center in London, and the contact information for this NCMC is on file with the Commission. ISAT US maintains a 24-hour point of contact within the United States with the capability and authority to cause an ESV on a U.S.-registered vessel to cease transmitting if necessary, using the facilities of the Lino Lakes Gateway Earth station. The 24-hour point of contact with the ability to shut down any of the terminals immediately upon notification of harmful interference is Ananda Mishra, available at 808 638-5820. Contact information for Mr. Mishra and the remote control point is reflected in Form 312 Questions E61-E66.