August 8, 2020

VIA IBFS AND EMAIL

Mr. Jose Albuquerque
Chief, Satellite Division
International Bureau
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

RE: Supplement to R2 Space, Inc. XR Satellite Network Application, IBFS File No. SAT-LOA-20200511-00042 (Call Sign S3067)

Dear Mr. Albuquerque:

This letter responds to requests for additional information concerning the above-referenced application made by the Commission via email on August 4, 2002. This letter supplements previously furnished application information provided on June 3, 2020, and additional supplemental information provided by R2 Space on July 20, 2020. The additional questions that resulted from the supplemental information, along with the response of R2 Space, is set forth below.

1. ***Please address ITU R.R. No. 22.5, as it relates to operations in the 8025-8400 MHz frequency band.***

   R2 Space will use the 8025-8400 MHz frequency band for payload data downlinking. All transmissions in this frequency band will be directed at the earth ground stations and not towards a geostationary-satellite orbit (GSO).

   If the XR satellite were to transmit directly towards a GSO satellite at its closest approach point, the maximum power flux density (PFD) at the GSO satellite would be -187

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(W/m^2) at any 4 KHz band, well below the -174 (W/m^2) limit specified in ITU R.R. No. 22.5. PFD is calculated as follows: PFD [dB(W/m / 4 kHz] = EIRP (dBW) – 71 – 20log10(D) – 10log10(BW) – 24, where EIRP is the Maximum EIRP of the XR satellite transmission, D is the distance between the XR satellite and a GSO satellite in kilometers, and BW is the bandwidth of the transmission in MHz.

2. ***Regarding operations in the 9500-9800 MHz frequency range, the referenced ITU RS.2094 states a particular interference mitigation technique may reduce interference caused by SAR antennas. Please provide a description of any mitigation techniques you will be employing in the 9500-9800 MHz range.***

   The XR satellite SAR payload transmits a pulsed signal within the operating frequency range of 9500-9800 MHz which, as indicated in ITU RS.2094, greatly reduces the potential for interference as compared to other transmission techniques. When turned on, the XR satellite will only transmit over specific areas of the earth, for a specific collection objective and only for a short burst of pulses. The pulse width and repetition frequency of the XR satellite SAR transmission are variable and will be monitored and continuously tuned to reduce the average interfering signal power level. Additionally, the antenna gain of the XR satellite is variable for each phased array panel which allows for additional tuning to reduce unwanted signal power and optimize phased weighted gain across the antenna. These core tuning techniques help to ensure minimal chance of interference from the XR satellite SAR payload transmissions.

3. ***Please clarify the S-band antenna beam contours shown on page 12 of the revised Technical Annex. Are the contours illustrated both the transmit and receive contours?***

   The S-band antenna beam contours shown on page 12 of the revised technical annex are for both transmit and receive.

4. ***Please briefly explain the discrepancy from the original Orbital Debris Mitigation Plan concerning the lack of surviving debris while having a non-zero casualty risk and what changed to result in a zero casualty risk in the updated document.***

   The original XR satellite Orbital Debris Mitigation Plan included an error in the casualty risk assessment. R2 Space modeled the XR satellite as a single object and not a system of panels and components. Once this error was corrected and the individual components were accounted for, the accurate zero casualty result was produced in the NASA Debris Assessment Software (DAS).

If there are any questions in connection with these clarifications, you may contact me at ryan@r2space.com or (207) 841-2170 or our FCC counsel, David Keir, at dkeir@lermansenter.com or (202) 416-6742.

Respectfully submitted,

DocuSigned by:
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Ryan Farris
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