

From: Laura Stefani

To: Nimesh Sangani

Date: April 15, 2019

Subject: Additional Information Request

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Message:

1) Please provide the detailed uplink and downlink transmission calculations along with the ITU reference standard used in the calculations.

RESPONSE:

AST&Science used the ITU accepted standards for interference calculations into mobile services in these bands, Recommendation ITU-R M.1823 (2007). Annex 1 contains the parameters and protection criteria for BS and MS. Based on these criteria and the calculations shown below, the proposed experiment will meet the protection criteria for the most sensitive receivers.

AST&Science additionally has attached the DAS Activity Log related to its orbital debris mitigation statement.

Thank you

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Satellite Downlink  
(BW1@ Midland's zenith)

Antenna gain = 2.3 dBi  
BW1 TX frequency = 847.75 MHz  
BW1 TX bandwidth = 5000 kHz  
Elevation angle (best case) = 90 degrees  
Shortest slant path = 505 km  
BW1 TX power = -7 dBW  
BW1 EIRP = -4.7 dBW  
Flux Density = -135.8 dBW/m<sup>2</sup>/1.23MHz  
Equivalent aperture = -20 dB m<sup>2</sup>  
Signal level at Terrestrial UE = -156.9 dBW/1.23MHz (assuming -1 dB Terrestrial UE antenna gain)  
= -126.9 dBm/1.23MHz  
Most Sensitive Receiver Reference Level = -119.6 dBm/1.23MHz (Per Recommendation ITU-R M.1823, Annex 1 for the most sensitive receiver - MS Traffic Channel RC1 and RC3)  
Protection Margin = 7.3 dB

Satellite Uplink  
(Uplink EIRP Between 0 degree to 30 degree Elevation)

Ground Antenna Peak Gain = 28 dBi  
Operating RF Power at Antenna Interface = 1 W  
Ground Antenna Peak EIRP at Operating Point = 28 dBW  
Ground Antenna Sidelobe Beyond Boresight +/- 50 degrees = -45 dB  
Uplink EIRP Between 0 degree to 30 degree Elevation = -17 dBW/5 MHz  
= 7 dBm/1.25 MHz  
Mobile Station EIRP (Per Recommendation ITU-R M.1823, Annex 1) = 23 dBm/1.25 MHz  
Margin (below Mobile Station EIRP) = 16.0 dB