

From: Nicolas Lee

To: Doug Young

Date: December 23, 2016

Subject: Request for Info - File #0238-EX-PL-2016

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Message:

1a) Applicant please provide more detail information about the transmitting beacon.

\*\*\* RESPONSE: \*\*\*

This application is for a CubeSat participating in the European QB50 project coordinated by the Von Karman Institute (VKI) in Belgium. The project requested that we broadcast a beacon globally in order to facilitate identification of individual CubeSats as they deploy, and they have established a memorandum of understanding with AMSAT to use amateur frequencies worldwide for this project. Our beacon consists of minimal health data.

1b) Can the beacon be controlled to only transmit over its service area?

\*\*\* RESPONSE: \*\*\*

No, we do not have this capability.

1c) Can the beacon be turn-off on command?

\*\*\* RESPONSE: \*\*\*

Yes, the beacon can be commanded to turn off.

2) Will the earth station transmit and/or receive signals from OTHER satellites/cubesats? If yes, what are the frequencies they will be transmitting and/or receiving?

\*\*\* RESPONSE: \*\*\*

Our ground station has the ability to receive signals from other QB50 satellites on amateur frequencies but we are not currently planning to operate as a ground station for the other satellites.

3) In the SpaceCap, Group id 1, UPLINK:

We reviewed the SpaceCap API file and the values does not match what we calculated with the equation below.

The Power Density (or Power Spectral Density) boxes C8a2/C8b2 (Max pwr dens) and box C8c3 (Min Pwr dens.) values don't match with our calculations; we calculated the power spectral density value using the following equation:

Power Spectral Density = Power (dBW) &ndash; 10 \* Log10 (Emission Bandwidth in Hertz).

Applicant please check and update the max and min power spectral density value.

\*\*\* RESPONSE: \*\*\*

Apologies - we found where we were using an outdated value in our calculations. We updated the SpaceCap file with the following values:

Uplink PSD =  $17 - 10 \cdot \log_{10}(2400) = 17 - 33.8 = -16.8$  dBW/Hz

Uplink C/N =  $41.1 + 10 \cdot \log_{10}(9600/2400) = 47.1$

4) In the SpaceCap, Group id 2, DOWNLINK:

Same issue here. We reviewed the SpaceCap API file and the values does not match what we calculated with the equation below.

The Power Density (or Power Spectral Density) boxes C8a2/C8b2 (Max pwr dens) and box C8c3 (Min Pwr dens.) values don't match with our calculations; we calculated the power spectral density value using the following equation: Power Spectral Density = Power (in dBW) &ndash; 10 \* Log10 (Emission Bandwidth in Hertz).

Applicant please check and update the max and min power spectral density value.

\*\*\* RESPONSE: \*\*\*

We updated the SpaceCap file with the following values:

Downlink PSD =  $6 - 10 \cdot \log_{10}(2400) = -27.8$

Downlink C/N =  $32.6 + 10 \cdot \log_{10}(9600/2400) = 38.6$