EXHIBIT A

Exhibit 1

Viasat has conducted simulations using Visualyse software from Transfinite Systems, Ltd., on the filed characteristics of each of the various NGSO systems proposed or authorized in the NGSO application processing round covering the NGSO-primary portion of the Ka band, and the characteristics of the ViaSat-2 blanket license earth stations ("VS-2 Earth Stations") to determine the potential for causing harmful interference into those NGSO systems under various operating conditions. The simulation software produces, as one of its outputs, a Cumulative Distribution Function (CDF) with the I/N value given as a percentage of time. In the case of NGSO systems where links are not static and are constantly changing, I/N as a function of time is a more useful metric than a static snapshot of a single I/N value being exceeded or not. This analysis considers the resulting I/N when there is no angular separation between the ViaSat-2 network and the various NGSO systems. It also considers the results when different minimal angular separations are maintained. Consistent with the technical analyses provided during the application process, this analysis focuses on the uplink case.

O3b System

Currently, O3b operates an NGSO system with an equatorial orbit and has filed applications both to increase the number of satellites in the equatorial plane and to add two additional inclined planes with eight satellites each for a total of 60 operational satellites, and a subsequent amendment to reduce the total number of operational satellites to 42 – 32 satellites in a non-inclined orbital plane and 5 each in two 70 degree inclined orbital planes. Viasat evaluated both systems and found that the results were not markedly different for the two systems so only the results for the latest amendment are included here. To analyze the O3b system, the simulations were broken down into three scenarios. First, an examination of the

equatorial orbit only was performed. Second, an examination of the inclined orbits only, and finally, an examination considering both the equatorial and inclined orbits of the O3b system was performed.

In each of these cases, the scenarios were run assuming a 1% TDMA burst duty cycle representing a sustained heavy traffic upload condition for the VS-2 Earth Stations over the simulation period.

In the case of the equatorial only orbit, VS-2 Earth Station operations in CONUS and Puerto Rico will result in a minimum separation angle of approximately 10.4 degrees when an O3b satellite passes under the VS-2 satellite potentially communicating with an earth station located in Puerto Rico. The associated I/N was calculated as -30.9 dB by Visualyse, based on a scenario in which the VS-2 Earth Station is located in close proximity with an O3b gateway station such that the O3b satellite's beam center is pointed at the VS-2 Earth Station. As the VS-2 Earth Station and the O3b gateway are moved further north, the minimum separation angle between the O3b equatorial orbit satellite and VS-2 in GSO increases and the I/N continues to decrease. From this analysis, it is very clear that, just as in the case of ViaSat-1 earth stations authorized under Call Sign E100143, no reduction in EIRP density or inhibition of transmissions from VS-2 Earth Stations is needed to operate compatibly with the O3b equatorial orbit for any of the U.S. territories served by VS-2.

In the case of the O3b inclined orbital planes, several simulations were performed at various locations to determine the frequency and magnitude of in-line events. The simulation results produce a Cumulative Distribution Function (CDF) of I/N versus percentage of time. The worst-case alignment during the simulation period resulted in an I/N of 9 dB. Notably, the duration of the alignment that results in an I/N of 9 dB is very brief, only two seconds long, and

occurs only once during the 30 day simulation period. Lower I/N values occur more frequently according to the CDF but the aggregate time percentage for the aggregate of all in-line events within the 30 day simulation period when an I/N of -12.2 dB level is exceeded is very small—a total of only 22 seconds. In other words, for more than 99.999% of the time, the I/N would be less than -12.2 dB; conversely, the I/N would exceed -12.2 dB only 8.13×10^{-4}% of the time. These results are summarized in Table 1 below. Also shown in Table 1 below are values for when the separation angle from GSO is set to the value proposed by O3b in order to meet the Article 22 epfd limits. The difference between the two cases is 22 seconds per month.

SpaceX System

Due to the density of the SpaceX constellation and the larger number of identical inclined orbital planes, it was not necessary to propagate the orbits over a 30-day period to develop reliable statistics for I/N values, so a 24 hour period was used instead. Multiple tracking strategies were evaluated for the SpaceX simulation, including scenarios in which the SpaceX earth station is communicating with a satellite in the constellation that (i) is the nearest, (ii) has the highest elevation, (iii) has the longest hold time, and (iv) avoids the GSO arc by 22 degrees, which is what SpaceX proposes in its application in order to meet the Article 22 epfd limits in band segments where those limits apply. In no case was a -12.2 dB I/N exceeded in any of the scenarios. These results are summarized in Table 1 below.

SpaceX in their June 26, 2017 reply comment presented calculations for a 10 degree separation angle. However, in practice when implemented in the Visualyse simulation software, such an alignment does not occur during the simulation of the network's operation. At all times in Visualyse, each of the selected tracking strategies resulted in very large separations from GSO. In fact, this seems consistent with SpaceX's application and public statements regarding

user terminals which will employ flat-panel antennas “roughly the size of a laptop” and which will use phased-array technology to track the satellites. Optimal scanning angles for phased-array terminals would suggest that higher elevations well-removed from the GSO orbit in most cases would be used in order to minimize scan losses and maximize link performance. Notably, SpaceX did not include an actual orbital simulation showing that the smaller separation angle of 10 degrees actually would be used. Additionally as explained in Exhibit 1 of Viasat’s Opposition and Response filed on June 15, 2017, SpaceX used the operational EIRP densities of Viasat’s earth stations that would typically be employed only during faded conditions, not clear sky, thus SpaceX incorrectly uses unrealistically high power densities for the VS-2 Earth Stations in their calculations. Accordingly, the Visualyse results here represent a more realistic operating scenario.

Additional NGSO Systems and Combined Results

In addition to the O3b and SpaceX systems, Viasat also evaluated seven other NGSO systems in the Ka band NGSO processing round with plans to operate in the NGSO-primary spectrum. Because Audacy and Kepler have not proposed systems operating in the 28.6-29.1 GHz band, they were not evaluated. Also, results were not evaluated for OneWeb as coordination has already been completed between Viasat and OneWeb for that system.

Table 1 below shows the results of the simulations for each system. A reference I/N of -12.2 dB is used for illustrative purposes to demonstrate the level and frequency of unwanted energy emitted toward the NGSO satellite in the circumstances described. That reference I/N is not intended as a threshold for when harmful interference would occur.

Table 1: I/N Results for VS-2 Earth Stations into NGSO Systems

System	Operator Separation Angle (deg)	Simulation Separation Angle (deg)	Tracking Strategy	I/N Exceeded	% Time	% of time meeting -12.2 dB	Worst I/N (dB)	Total Exceeded (s) / month	Longest Event (s)
Audacy		N/A	No links in "NGSO" band						
Boeing	6	N/A	Nearest	No	0	100.000	-15.69	0	0
Karousel	20	N/A	Nearest	No	0	100.000	-44.34	0	0
Leosat		N/A	Nearest	Yes	0.013872	99.986	23.76	360	4
Leosat	7	7	Avoid GSO	Yes	0.000055	100.000	-11.79	2	1
O3b Equatorial Only		N/A	Nearest	No	0	100.000	-30.9	0	0
O3b		N/A	Nearest	Yes	0.000813	99.999	9.09	22	2
O3b	7.6	7.6	Avoid GSO	No	0	100.000	-27.67	0	0
OneWeb		N/A	Not examined due to coordination already completed						
SpaceX		N/A	Nearest	No	0	100.000	-16.21	0	0
SpaceX	22	22	Avoid GSO	No	0	100.000	-18.97	0	0
Space Norway		N/A	No links in "NGSO" band in VS-2 coverage area						
Telesat		N/A	Nearest	Yes	0.006164	99.994	20.64	160	3
Telesat	11.9	11.9	Avoid GSO	No	0.000000	100.000	-19.57	0	0
Theia Holdings		N/A	Nearest	Yes	0.002057	99.998	19.47	22	2
Theia Holdings	10	10	Avoid GSO	No	0	100.000	-14.43	0	0

The results in Table 1 are provided for each system for several different separation angles. For each system, the results are provided for using a tracking strategy with no GSO avoidance and a separation angle of 0 degrees input into the tracking strategy, as well as for other values for minimum separation angle from GSO if an exceedance of the -12.2 dB I/N value was observed for 0 degrees separation angle. For example, in the case of Leosat, in-line events could occur resulting in an I/N exceeding -12.2 dB for a brief period (i.e., up to 4 seconds). Increasing the separation angle to the 7 degrees, which is the angular separation at which Leosat proposes to operate in the bands where Article 22 epfd limits apply results in -12.2 dB I/N essentially all of the time. In the case of Boeing, Karousel, Telesat, and Theia Holdings, the same holds true, with operation at the GSO angular separation each operator proposes to employ for similar reasons resulting in the -12.2 dB I/N never being exceeded.

In the case of Boeing and Karousel, adding a separation angle in Visualyse over choosing a tracking strategy such as nearest or highest, or longest hold time, had no real effect in that the -12.2 dB I/N is met at all times for those systems.

The orbits of each of these NGSO systems are readily predicted using long-proven orbital propagation routines, and the orbital element data for the orbits available from sources such as Space Track, a U.S. government resource, or from the NGSO operators themselves. The orbital separation from the NGSO satellites and VS-2 can be easily determined. We do not believe that VS-2 Earth Station operations would result in harmful interference in NGSO-primary band segments under any circumstances, but the shut-off capabilities Viasat has previously described will in any event protect NGSO systems from harmful interference from VS-2 Earth Stations. Specifically, the VS-2 satellite has been designed with the capability to cease operations in the 28.6-29.1 GHz uplink band (and in the associated 18.8-19.3 GHz downlink band) on a beam by beam basis in any spot beams where the predicted physical alignment of either (i) an NGSO space station and an earth station communicating with the VS-2 satellite, or (ii) the VS-2 satellite and an earth station communicating with an NGSO space station, occurs, such that the angular separation between operational links of the two satellite networks would be equal to or less than a specified minimum line-of-sight separation angle. In addition, as all earth stations in the VS-2 network operate under control of a Network Management System (NMS) that coordinates the real-time operations of the TDMA scheduler for each beam on the satellite, cease transmission commands can be sent to individual earth stations for the duration of the brief period when the separation angle falls below the specified minimum as calculated by the NMS using data from Space Track or the NGSO operators.

DECLARATION

I hereby declare that I am the technically qualified person responsible for preparation of the engineering information contained in this Petition for Partial Reconsideration of Viasat, Inc. ("Petition"), that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted with this Petition, and that it is complete and accurate to the best of my knowledge, information and belief.

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