Description of Modification

With this application, Viasat, Inc. ("Viasat") requests modification of its earth station located in Pendergrass, Georgia (call sign E160161, File No. SES-MOD-20170718-00770) to add new narrowband emissions that will be used to communicate with the General Atomics Orbital Test Bed ("OTB") Earth Exploration Satellite Service ("EESS") non-geostationary orbit ("NGSO") satellite. The Viasat ground station will be used with the OTB satellite for telemetry, tracking and control ("TT&C") in both Launch and Early Operation (LEOP) and ongoing operations. The technical parameters will be identical for both the LEOP and ongoing operations.

The OTB satellite is expected to be launched in the second quarter of 2018 and will be used for remote sensing applications. It will operate in a circular, inclined orbit of 24 degrees at an altitude of 720 km. General Atomics has not yet filed an application for authority to operate the OTB satellite with the Commission. However, General Atomics has discussed the proposed satellite operations with Commission staff and other interested agencies. Viasat expects General Atomics to file shortly an application for authority with the Commission containing the technical parameters of the satellite. This request to modify the Pendergrass earth station is being submitted at this time due to the short time until satellite launch and the need to provide critical LEOP support.

The emission designators that will be used with the OTB satellite will be narrower than the existing emissions on the license, and thus, the earth station may be operated at power spectral density levels that are higher than currently authorized. Viasat originally coordinated the earth station operations with TV broadcast auxiliary service ("BAS") licensees in the vicinity. In that coordination, Viasat confirmed to potentially impacted BAS licensees that Viasat would undertake certain measures to mitigate potential interference. Namely, Viasat indicated that it would construct a shielding berm to protect a particular antenna tower location that does not have sufficient naturally occurring terrain shielding in the direction of Viasat's earth station. Viasat intends to conduct testing to confirm that the berm sufficiently protects the potentially impacted BAS stations. In addition, in connection with the original license application, Viasat prepared an analysis of the potential impact of the earth station operations on certain communications links with helicopters used in electronic news gathering by one particular BAS licensee. Viasat indicated that it would undertake coordination with that BAS licensee for the periodic helicopter operations.

The higher power operations proposed in this application are still within the scope of the coordination Viasat undertook in connection with the currently authorized earth station parameters. Attached here is a supplement to the original coordination study that Viasat provided in the original license application. The supplement confirms that the berm contemplated in the original coordination report would be sufficient to shield the BAS stations at the antenna tower location at issue, even with the narrower bandwidth emissions proposed in this application. Viasat will also coordinate testing of the berm and the above-mentioned helicopter operations, as it originally committed to doing. Therefore, the proposed modifications are within the scope of the original coordination.

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November 10, 2017

Daryl Hunter, P.E.
Senior Director, Regulatory Affairs
ViaSat, Inc.
6155 El Camino Real
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Dear Mr. Hunter:

This is a supplement to our July 22, 2016, report, Frequency Coordination Study for Proposed EESS Uplink near Pendergrass, Georgia. That study was based on a 2 GHz Earth Exploration Satellite Service (EESS) uplink on 2,056 MHz with 1M31F1D emission and a main beam equivalent isotropic radiated power (EIRP) of 83.2 dBm. The uplink signal would therefore be co-channel with TV Broadcast Auxiliary Service (BAS) Channel A3, 2,049.5–2,061.5 MHz.

The power flux density, expressed in the standard International Bureau units of dBW/4 kHz, would be 28.0 dBW/4 kHz. Mr. Gerry Einig of ViaSat's System Engineering department asked whether a shielding berm with at least 37 dB of isolation, the amount of shielding we found necessary to protect a nearby electronic news gathering receive-only (ENG-RO) with no terrain obstruction to the proposed uplink antenna, would remain sufficient to ensure no interference if uplink signals with narrower emission (but no increase in main beam EIRP) were to be used. These narrower signals could increase the power spectral density by up to 25 dB (but again, not increase the main beam EIRP).

The protection criteria used for our study was a very stringent – no more than a 0.5 dB degradation of the protected ENG signal – and the protected received signal level (RSL) was not a predicted, rain or Raleigh-faded signal but rather the noise floor of a highly-sensitive central ENG receiver itself. The receiver's noise floor was used because the location of an originating ENG truck could be at the furthest extent of the useful service distance for an ENG receive site. Because of this stringent interference criteria, which is a frequency re-use criteria, not a frequency-sharing criteria, the interference from a below-threshold uplink signal should be quite insensitive to the modulation density. That is, if a co-channel potentially interfering signal is at least 9 dB below the -105 dBm RSL noise threshold assumed for a 6 MHz wide split-channel digital ENG signal, it should no longer matter what the bandwidth of the interfering signal is. This might not be true for an extreme case of a continuous wave (CW) interfering signal, but

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that is not what you have proposed; rather, the uplink signal would still have digital modulation, but it would be a narrower emission than the 1M31F1W emission that our 2016 report studied.

Thus, it is our opinion that a shielding berm with at least 37 dB of attenuation towards the nearby and line-of-sight "Fox Tower" ENG-RO site would continue to be adequate even for narrower bandwidth uplink signals. Note that the 252.4°T±3° EESS transmitting antenna preclusion azimuth called for in our 2016 study would still be required.

We appreciate the opportunity to be of service and would welcome any questions on this matter. Please let us know if we can be of further assistance.

Sincerely,

Dane E. Ericksen
rb

cc: Mr. Gerry Einig - BY E-MAIL GERRY.EINIG@VIASAT.COM