

## Description of Application

Viasat, Inc. (“Viasat”) seeks authority to operate a 4.1 meter, Model VA-41-KA gateway-type earth station in West Bridgewater, Massachusetts, in the Ka band to communicate with the ViaSat-2 satellite. The earth station will be located at 265 North Main Street, West Bridgewater, MA 02379. Grant of this application is in the public interest because it will allow the deployment of an earth station that will serve as an aggregation and interconnection point for the ViaSat-2 network.

The earth station will operate with the ViaSat-2 satellite at 69.9° W.L., which operates under the authority of the United Kingdom, in the 17.7-19.3 GHz and 19.7-20.2 GHz downlink frequencies and the 27.5-29.1 GHz and 29.5-30.0 GHz uplink frequencies.<sup>1</sup>

Viasat seeks authority to operate the earth station (i) in the 18.3-18.8 GHz, 19.7-20.2 GHz, 28.35-28.6 GHz and 29.5-30.0 GHz frequencies on a primary basis; (ii) in the 18.8-19.3 GHz and 28.6-29.1 GHz frequencies on a secondary basis to NGSO FSS systems;<sup>2</sup> (iii) in the 17.8-18.3 GHz band on a secondary basis to fixed terrestrial services; (iv) in the 27.5-28.35 GHz frequencies on a secondary basis to Upper Microwave Flexible Use (“UMFU”) services with the rights and protections afforded by Section 25.136; and (v) in the 17.7-17.8 GHz on an unprotected, non-interference basis pursuant to a waiver. ViaSat-2 is authorized to operate in each of these band segments.

To the extent necessary, Viasat requests a waiver of the U.S. Table of Frequency Allocations (“U.S. Table”) to allow the earth station to receive communications from ViaSat-2 at 17.7-17.8 GHz on a non-conforming basis. Granting a waiver to allow the operation of the earth station in this band is in the public interest because it will allow Viasat to deploy the earth station, which will serve as an aggregation and interconnection point for the ViaSat-2 network. ViaSat-2 incorporates Viasat’s next-generation satellite technology, which will utilize this spectrum to provide greater capacity and throughput for a range of communications services to businesses, consumers and governmental users. Moreover, as discussed in more detail below, operation of the earth station will occur without causing harmful interference into the services that are designated as primary within the United States.

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<sup>1</sup> See IBFS File Nos. SAT-LOI-20130319-00040 (granted Dec. 12, 2013); SAT-MOD-20141105-00121 & SAT-AMD-20150105-00002 (granted Apr. 15, 2015); SAT-MOD-20160527-00053 (granted Jan. 12, 2017) (“ViaSat-2 2016 Modification Application”); Call Sign S2902 (“ViaSat-2 Authorization”).

<sup>2</sup> After the Commission granted U.S. market access to ViaSat-2 in the 18.8-19.3 GHz and 17.8-18.3 GHz band segments on a non-interference basis pursuant to waivers of the U.S. Table of Frequency Allocations, the Commission adopted secondary allocations for GSO FSS operations in these bands. See *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order, 32 FCC Rcd 7809 ¶¶ 7, 15 (2017) (“NGSO Order”).

## I. CONSISTENCY WITH CO-FREQUENCY OPERATIONS

The proposed operations are compatible with the operations of adjacent GSO systems, as well as co-frequency NGSO systems, primary terrestrial users, and BSS feeder link Earth-to-space transmissions.

### A. GSO Operations

The earth station has measured antenna gain patterns that conform to Section 25.209(a) and (b). A certification pursuant to Section 25.132(a)(1) regarding the conformance of this antenna with Sections 25.209(a) and (b) is included with this application. The input power spectral density into this antenna will not exceed 3.5 dBW/MHz, in accordance with Section 25.212(e). Thus, the earth station is fully two-degree compliant in each of the requested band segments.

### B. NGSO Operations

ViaSat-2 operates in the United States in the 28.6-29.1 GHz and 18.8-19.3 GHz band segments on a secondary basis with respect to NGSO FSS systems. NGSO systems are designated as primary in the U.S. in these frequencies. The proposed earth station operations would not cause harmful interference into NGSO systems as a result of the conditions in the ViaSat-2 Authorization designed to protect NGSO systems in the 18.8-19.3 GHz downlink band segment and the associated 28.6-29.1 GHz uplink band segment, and as discussed in the ViaSat-2 Modification Application.<sup>3</sup>

### C. UMFU

Viasat will operate the earth station in the 27.5-28.35 GHz band segment consistent with the provisions of Section 25.136 regarding compatibility with Upper Microwave Flexible Use (“UMFU”) operations. The proposed earth station meets the criteria for protection under Section 25.136(a)(4). The attached Technical Analysis in Exhibit A details the earth station’s compliance with these criteria.

The modified earth station location is in Plymouth County, Massachusetts. There are no other earth stations authorized for the 27.5-28.35 GHz band segment in Plymouth County.<sup>4</sup> Therefore, this earth station would be the first of the three earth stations allowed to operate in Plymouth County under Section 25.136(a)(4)(i).

In addition, the total population covered by the -77.6 dBm/m<sup>2</sup>/MHz contour is well below the applicable threshold specified in Section 25.136(a)(4)(ii).<sup>5</sup> The attached Technical Analysis

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<sup>3</sup> See IBFS File No. SAT-LOI-20130319-00040, Call Sign S2902, at Attach. ¶ 4 (granted Dec. 12, 2013); ViaSat-2 2016 Modification Application, Supplemental Technical Annex at A.11.

<sup>4</sup> See 47 C.F.R. § 25.136(a)(4)(i).

<sup>5</sup> See *id.* at § 25.136(a)(4)(ii).



details the calculation methodology of the covered population and demonstrates that the earth station complies with the applicable limit.

The -77.6 dBm/m<sup>2</sup>/MHz contour does not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port, or any road identified as an Interstate Freeway, Expressway or Other Principal Arterial road by the Federal Highway Administration Office of Planning, Environment, and Realty Executive Geographic Information System (“HEPGIS”) map.<sup>6</sup>

Finally, Viasat has commissioned Comsearch to identify any existing terrestrial facilities constructed and in operation in the 27.5-28.35 GHz band for purposes of coordinating with any such stations within the earth station’s -77.6 dBm/m<sup>2</sup>/MHz contour. As explained in the attached Comsearch report, no such stations were identified. Therefore, the coordination requirement in Section 25.136(a)(4)(iv) is satisfied. Nevertheless, Viasat has initiated coordination with existing terrestrial licensees in the vicinity of the earth station site, and Comsearch has sent a prior coordination notice (“PCN”) on Viasat’s behalf to all such licensees. No objections were received in response to the PCNs.

Therefore, the earth station qualifies to operate without regard to any potential UMFU stations near the earth station location.

#### **D. Fixed Service and BSS**

Viasat requests authority for receive operations using the proposed earth station from the ViaSat-2 satellite in the 17.7-18.3 GHz band segment. The 17.7-18.3 GHz band segment is allocated on a primary basis for fixed services (“FS”). In the 17.8-18.3 GHz portion of this band segment, the Commission recently adopted a secondary FSS allocation.<sup>7</sup> The 17.7-17.8 GHz portion of the band segment is allocated to FSS on a co-primary basis, but this FSS allocation is limited by footnote US271 to broadcasting-satellite service (“BSS”) feeder links in the Earth-to-space direction.<sup>8</sup>

In seeking market access for ViaSat-2, Viasat demonstrated that its FSS downlinks in the 17.7-18.3 GHz band segment are compatible with primary fixed service operations and neighboring BSS operations.<sup>9</sup> More specifically, Viasat demonstrated that downlink transmissions from ViaSat-2 will be within the power-flux density limits at the earth’s surface set

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<sup>6</sup> <https://hepgis.fhwa.dot.gov/fhwagis/#>; see *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Second Report and Order, 32 FCC Rcd 10988, Appendix B (2017) (“HEPGIS allows the user to enter any street address in the U.S. and display an interactive map with a legend that identifies road classifications as they are defined by the Department of Transportation at 23 C.F.R. Section 470.105 pursuant to 23 U.S.C. Sections 101 and 103”); 47 C.F.R. § 25.136(a)(4)(iii).

<sup>7</sup> *NGSO Order* at ¶ 7.

<sup>8</sup> 47 C.F.R. § 2.106 n.US271.

<sup>9</sup> See *ViaSat-2 2016 Modification Application*, Technical Annex at 7-10.

forth in Article 21 of the ITU Radio Regulations and would not cause harmful interference into primary fixed service operations throughout the 17.7-18.3 GHz band segment.

Because the 17.7-17.8 GHz band segment is not allocated for the FSS downlinks proposed in the application, Viasat requests a waiver with respect to this band segment. The Commission granted a waiver of the U.S. Table to authorize ViaSat-2 for U.S. market access based on a showing that the ViaSat-2 downlinks at 17.7-17.8 GHz would not cause harmful interference into primary fixed service operations or neighboring BSS spacecraft. A corresponding waiver to allow the earth station to receive ViaSat-2 downlinks at 17.7-17.8 GHz would have no impact on the authorized RF environment. To the extent necessary, Viasat seeks a corresponding waiver to allow the proposed earth station to receive signals from ViaSat-2 at 17.7-17.8 GHz. As a non-conforming user of this band segment, Viasat accepts the risk of interference from conforming spectrum uses.

## **II. RADIATION HAZARD ANALYSIS**

A radiation hazard analysis for the proposed antenna is attached hereto as Exhibit D. As demonstrated by the results of the analysis, harmful levels will not be present in areas occupied by the general population, and the antenna does not present a risk to trained personnel in the controlled area in the immediate vicinity of the antenna.

## **III. FAA NOTIFICATION**

The proposed 4.1 meter antenna is exempt from notification to the FAA under Section 17.7(e)(3) of the Commission's rules because the height of the antenna is less than 6.1 meters above ground level.

## DECLARATION

I hereby declare that:

1. I am the technically qualified person responsible for preparation of the engineering information contained in this application and that I am familiar with Part 25 of the Commission's rules.
2. In accordance with Section 25.132(a)(1) of the Commission's rules, I have reviewed the results of a series of radiation pattern tests, and the test results demonstrate that the Model VA-41-KA antenna meets relevant off-axis gain standards in Section 25.209.

The foregoing is true and correct to the best of my knowledge, information and belief.



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