

LATHAM & WATKINS^{LLP}

April 11, 2017

VIA ELECTRONIC FILING IN IBFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
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Re: ViaSat, Inc., IBFS File No. SAT-LOI-20161115-00120, Call Sign S2985

Dear Ms. Dortch:

ViaSat, Inc. (“ViaSat”) submits the attached response to the Commission’s request dated March 10, 2017 for additional information regarding the above-referenced petition for a declaratory ruling requesting U.S. market access for a non-geostationary orbit (“NGSO”) fixed-satellite service system. The attached response provides the technical information and analysis requested.

If you have any questions regarding this submission, please contact the undersigned.

Respectfully submitted,

/s/

John P. Janka
Elizabeth R. Park
Jarrett S. Taubman

Attachment

cc: Jose Albuquerque
Stephen Duall

Response to Request for Information

Request

To aid in the Commission's evaluation of ViaSat's petition, please provide additional information concerning the post-mission disposal plans for ViaSat's satellites. In particular, please provide a statement and/or analysis with respect to the long-term stability or instability of the proposed post-mission storage orbit. Such analysis should address any measures, such as selection of orbital parameters, that may affect the long-term evolution of orbital parameters, with particular attention to addressing any such evolution that would result in the satellites entering the LEO protected region, i.e., the area below 2000 km.

Response

As stated in the ViaSat-NGSO application:

At EOL, ViaSat will dispose of the VIASAT-NGSO satellites by moving them to a storage orbit at 8,500 km. This is compliant with U.S. Government Orbital Debris Mitigation Standard Practices, Objective 4, Post-mission Disposal Of Space Structures. Sufficient fuel will be reserved for the post-mission disposal maneuvers.

U.S. Government Orbital Debris Mitigation Standard Practices (USGODMSP), Objective 4, Post-mission Disposal Of Space Structures, provides for three disposal options – atmospheric reentry, maneuvering to a storage orbit, and direct retrieval. For the second option, maneuvering to a storage orbit, USGODMSP identifies four storage regimes – Between LEO and MEO, Between MEO and GEO, Above GEO, and Heliocentric (Earth escape). The Between LEO and MEO regime is described as:

Maneuver to an orbit with perigee altitude above 2000 km and apogee altitude below 19,700 km (500 km below semi-synchronous altitude)

This is the option that ViaSat has selected for disposal of the ViaSat-NGSO constellation. ViaSat will reserve sufficient fuel at EOL to maneuver the ViaSat-NGSO satellites to a storage orbit 300-km above their operational orbit altitude.

These 8,500-km altitude, 87° inclination, circular post-mission storage orbits are stable for all initial values of RAAN and mean anomaly under the combined effects of gravitational anomalies, solar radiation pressure, solar and lunar perturbations, and atmospheric drag.

The ViaSat-NGSO vehicles are based on the Boeing 702HP bus which has the following parameters:

Total Solar Pressure Area, $A = 128 \text{ m}^2$

Dry Mass of Satellite, $M = 4197 \text{ kg}$

Solar Pressure Radiation Coefficient, $C_R = 1.3$

The effective area-to-mass ratio is given by $C_R * A / M = 0.0396 \text{ m}^2/\text{kg}$.

ViaSat has conducted extensive simulations to verify these parameters are sufficient to ensure long-term stability of the post-mission disposal orbits. NASA's DAS 2.1 tool was used to evolve the perigees of satellites in the disposal orbit over 100 years, which is the maximum assumed period allowed by this software. The minimum perigee observed over this assumed time frame was above 8,475-km. This is less than a 25-km decrease over 100 years, and still 6,475-km above the LEO protected region. In addition, a similar analysis using NASA's GMAT R2016a tool confirms disposal orbit stability for over 200 years.

DECLARATION

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



Daryl T. Hunter, P.E.
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