SPACEX

June 29, 2020

BY ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

Re: *Space Exploration Holdings, LLC, IBFS File No. SAT-MOD-20200417-00037*

Dear Ms. Dortch:

This letter is in response to a recent ex parte filing[1] from DISH Network L.L.C. ("DISH") regarding the above referenced modification proposed by Space Exploration Holdings, LLC ("SpaceX") to its authorization to improve the safety profile of its Ku/Ka-band non-geostationary ("NGSO") fixed-satellite service ("FSS") system.

As discussed below, DISH's assertions – which are not supported by any technical analysis – are wholly unfounded. Indeed, SpaceX fully addressed these concerns in its application, and actually provided far more information than required under the Commission's rules. In addition, SpaceX offered to provide the data files underlying its analysis to any interested party wishing to perform its own analysis – an offer that DISH did not accept, which may explain why its arguments are so uninformed and ill-conceived. Accordingly, the Commission should ignore DISH's baseless submission.

Just as it currently does, after the proposed modification SpaceX will continue to comply with both Commission and international standards to protect Direct Broadcast Satellite ("DBS") systems such as the one operated by DISH. As DISH is aware, DBS and many NGSO FSS systems are authorized to provide service in the United States using the same 12.2-12.7 GHz band. The international community recognized the difficulties in operating two types of service in the same frequencies and therefore developed robust safeguards to protect DBS systems in the form of limits on the equivalent power flux-density ("EPFD") of NGSO systems. These limits are codified in Article 22 of the rules of the International Telecommunication Union ("ITU"). "Any NGSO FSS system operating in compliance with these limits is considered as having fulfilled its obligation under Article 22 of the ITU Radio Regulations not to cause unacceptable interference to any GSO network."[2] DISH recognizes this fact.[3]

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1 *See* Letter from Jeffrey Blum to Marlene Dortch, IBFS File No. SAT-MOD-20200417-00037 (June 16, 2020) ("DISH Ex Parte").

2 *Updates to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, 32 FCC Rcd. 7809, ¶ 32 (2017) ("*NGSO Update Order*").

3 *See* DISH Ex Parte at 1-2.

1155 F Street, NW Suite 475 Washington, DC 20004
phone 202.649.2700 fax 202.649.2701
spacex.com

SpaceX has also confirmed its compliance with the applicable limits. Specifically, SpaceX used the EPFD validation software developed by Transfinite Systems, which has been verified by the ITU as an appropriate implementation of the ITU algorithm for calculating EPFD. SpaceX ran the software in full compliance with ITU methodology and presented the results with its application to confirm that its system would operate within all applicable limits – including those specifically designed to protect DBS systems.[4] Just as it has in conjunction with previous modifications, SpaceX even offered to "make the data files underlying this analysis available to interested parties upon request."[5] Although DISH has never requested that data for this or for previous modifications, SpaceX once again renews its offer to provide it should DISH actually wish to undertake the EPFD analysis. But given DISH's failure to request the data thus far, the Commission should consider its current postulated assertions as little more than uninformed speculation.

In addition to failing to even ask for the data necessary to support its allegations, DISH also relies on outdated rules. DISH argues that SpaceX should have provided the same information in its EPFD analyses of proposed modifications filed in and after 2018 that it provided with its initial application in 2016.[6] Yet DISH never mentions that the Commission revised its rules for NGSO FSS systems in 2017 – including the rules for EPFD showings. Specifically with respect to EPFD, because the Commission decided to incorporate by reference the EPFD limits adopted by the ITU, it also revised its rules to eliminate the requirement that NGSO FSS applicants demonstrate compliance and instead required that applicants certify that they would comply and receive a favorable determination from the ITU.[7] SpaceX made the showing required by the rules in 2016 and did again for this modification. In fact, SpaceX went further as part of this modification by providing an analysis demonstrating its compliance with the EPFD limits.[8] In other words, SpaceX provided an EPFD analysis even though it was no longer required under the rules – a fact that DISH fails to mention. Confusingly, DISH cites OneWeb as an exemplar on EPFD issues,[9] even though OneWeb did not even provide an EPFD showing in any of its recent applications similar to the one SpaceX submitted.[10]

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4 *See* SpaceX Application, IBFS File No. SAT-MOD-20200417-00037, Technical Attachment at Annex 2.

5 *Id.* at A2-1.

6 *See* DISH Ex Parte at 7.

7 *See NGSO Update Order*, ¶ 41 ("Given the newly available ITU validation software and the separate analysis conducted by the ITU, we will simply require NGSO FSS applicants to certify that they will meet the international EPFD limits."); 47 C.F.R. § 25.146(a)(2) (codifying EPFD certification requirement).

8 *See* SpaceX Application, Technical Attachment at 15 and Annex 2.

9 DISH points out that even though no more than two OneWeb satellites would transmit service links to any one location, OneWeb included up to 40 satellites in its EPFD analysis to account for potentially contributing emissions from all sources. *See* DISH Ex Parte at 5. While this may be an appropriate method to use for NGSO satellites that have large fixed beams (like OneWeb), it is not needed for a system in which all satellites have steerable beams (like SpaceX). In any event, the emissions from the additional satellites that would not have been captured by the software are truly negligible.

10 *See* IBFS File Nos. SAT-AMD-20180104-00004, Attachment A at 29 (Jan. 4, 2018); SAT-MOD-20180319-00022, Attachment A at 11 (Mar. 19, 2018); SAT-MOD-20200526-00062, Attachment A at 15-16 and Attachment B at 25-26 (May 26, 2020).

In addition to its failure to undertake the analysis that would have demonstrated that its concerns are unwarranted, DISH compounds this error with a conceptual misunderstanding of satellite mechanics. Specifically, DISH asserts that by reducing the orbital altitudes of its satellites and increasing the number of orbital planes, SpaceX would "tighten the net" of satellites encircling the Earth. DISH concludes that "[t]he effect of these changes is to position more SpaceX satellites in between the distant GSO satellites DBS operators, such as those DISH Network relies on to deliver services, and the equipment that their customers use to receive these signals in the band."[11]

In fact, the proposed modification would have the opposite effect. As a result of the proposed changes, SpaceX will have fewer satellites in view from a given location in the United States than there would be with SpaceX's constellation as currently authorized. As summarized in Figure 1 below, even assuming a lower minimum elevation angle (25 degrees rather than 40 degrees), the number of satellites in view will decrease on average from 22.17 to 21.21.

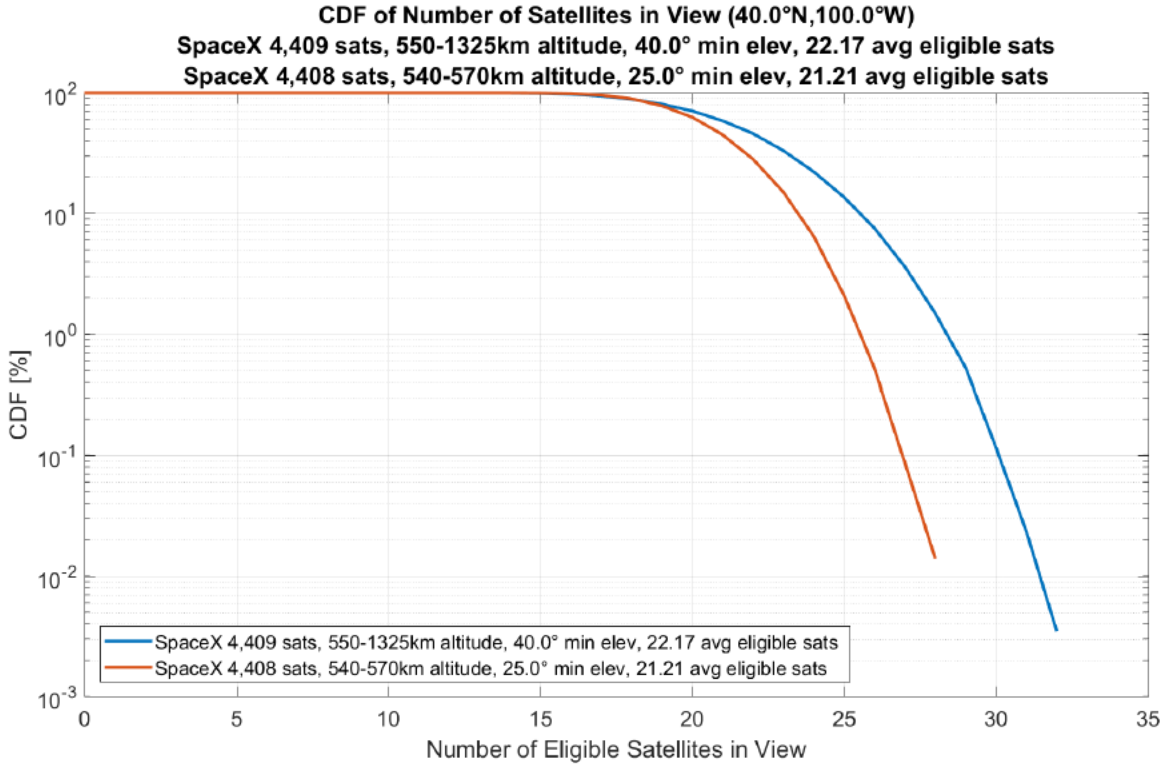

Figure 1. Satellites in View From U.S. Location

[11] DISH Ex Parte at 4.

Thus, to the extent one considers a satellite in view from a given location to be "in between" that location and a GSO satellite,[12] the modification proposed by SpaceX would actually reduce the number of such satellites.

In summary, DISH raised its concerns without even taking the time to request the data with which it could determine if those concerns were legitimate. Had it taken advantage of SpaceX's offer to provide that data and then undertaken the rigorous analysis that SpaceX did, DISH would have found that the modifications proposed by SpaceX remain compliant with the applicable EPFD limits and therefore pose no cognizable interference risk to DBS systems. As such, the Commission should ignore DISH's unfounded concerns.

Sincerely,

/s/ David Goldman

David Goldman
Director of Satellite Policy

SPACE EXPLORATION TECHNOLOGIES CORP.
1155 F Street, NW
Suite 475
Washington, DC 20004
Tel: 202-649-2641
Email: David.Goldman@spacex.com

[12] It is worth noting that a majority of the satellites in view above the horizon from any site in the U.S. would not be located in the direction of the equatorial GSO arc where DISH operates its DBS satellites. Moreover, SpaceX and other NGSO FSS operators typically observe an exclusion zone around the GSO arc in which their satellites will not operate.