

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

Application of)	
)	
SPACE EXPLORATION HOLDINGS, LLC)	Call Sign S2983/S3018
)	
For Special Temporary Authority)	IBFS File No. SAT-STA-20200610-00071

**PETITION TO DENY OR DEFER
OF VIASAT, INC.**

Viasat, Inc. requests that the Commission deny or defer consideration of the above-referenced application of Space Exploration Holdings, LLC (“SpaceX”) for Special Temporary Authority (“STA”) to operate at substantially different parameters than those authorized to date. Viasat has an interest in this application because it provides service to customers, and operates satellites, using frequencies that are the subject of the STA application. As detailed below, many questions remain about the information provided by SpaceX in its STA application, required analysis has not been provided, and additional review and investigation are needed before the Commission can contemplate granting this STA request.

DISCUSSION

SpaceX seeks STA for 180 days to allow its satellites to communicate with earth stations during orbit-raising, de-orbiting, and early phases of operations.¹ SpaceX does not seek merely an extension of its prior STA. Rather, it seeks new and additional authority. Specifically, SpaceX seeks authority to conduct some transmissions at power levels eight times the level

¹ SpaceX seeks STA in the following frequencies for telemetry, tracking, and command: 12.15-12.25 GHz (space-to-Earth) and 13.85-14.0 GHz (Earth-to-space); and the following frequencies for payload testing: 10.7-12.7 GHz (space-to-Earth), 14.0-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 18.8-19.3 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-29.1 GHz (Earth-to-space), and 29.5-30.0 GHz (Earth-to-space). FCC Report No. SAT-01478, Satellite Policy Branch Information, Space Station Applications Accepted for Filing (rel. July 2, 2020).

previously authorized to date. SpaceX claims that the power increase is necessitated by difficulties it has had in reliably acquiring all of the 60 satellites that it launches at once.² Notably, the application is not supported by any interference analysis to support the proposed increased power levels. As explained below, the request raises several areas of concern – from the lack of justification for the substantial power increase, to the proposal to operate above limits currently in place to protect other spectrum users from harmful interference, to SpaceX’s proposal to operate at levels expected to generate harmful interference without providing affected spectrum users an effective remedy.

1. The STA Request Is Not Justified

As an initial matter, SpaceX has not explained the cause of the problem that allegedly justifies a change in the terms of the authority on which SpaceX has relied to launch over 500 satellites to date.³ Precisely what problem necessitates this substantial deviation from currently authorized power levels? Is this the result of a design flaw or just a matter of convenience? And why should other users of the spectrum be expected to accept the risks to their operations

² See *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20200610-00071, Special Temporary Authority Request, Narrative at 1 (filed June 10, 2020).

³ See *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20200229-00023, Stamp Grant (IB rel. Mar. 19, 2020); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20200229-00022, Stamp Grant (IB rel. Mar. 19, 2020); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20191230-00156, Stamp Grant (IB rel. Mar. 19, 2020); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20200207-00014, Stamp Grant (IB rel. Feb. 10, 2020); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20200103-00005, Stamp Grant (IB rel. Jan. 30, 2020) (“Jan. 30, 2020 STA”); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20191230-00155, Stamp Grant (IB rel. Jan. 16, 2020) (“Jan. 16, 2020 STA”); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20191220-00151, Stamp Grant (IB rel. Jan. 2, 2020); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20191118-00134, Stamp Grant (IB rel. Dec. 5, 2019); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20190924-00098, Stamp Grant (IB rel. Nov. 7, 2019) (“Nov. 7, 2019 STA”); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20191018-00118, Stamp Grant (IB rel. Oct. 25, 2019); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20190917-00095, Stamp Grant (IB rel. Sept. 25, 2019); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20190815-00075, Stamp Grant (IB rel. Sept. 4, 2019); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20190717-00063, Stamp Grant (IB rel. July 25, 2019); *Space Exploration Holdings, LLC*, IBFS File No. SAT-STA-20190405-00023, Stamp Grant (IB rel. May 9, 2019).

resulting from SpaceX’s design choices or system failures? To be sure, any design issues or cost savings that SpaceX seeks to achieve may not be done at the expense of increased interference to others—interference that SpaceX has not even attempted to analyze or quantify on the record. Moreover, if SpaceX has problems reliably acquiring 60 satellites at once, what type of problems can SpaceX expect to have, and what further power increases will it claim to need, when it seeks to launch 400 spacecraft at once?⁴ Furthermore, why is this STA request even needed when SpaceX concurrently seeks “permanent” launch, early operations, and deorbit authority that it separately claims will obviate the need for further STAs like this in the future?⁵

2. The Impact of an 8x Power Increase Is Not Analyzed

SpaceX seeks permission to operate at significantly higher power density levels than it previously has been authorized to use.⁶ Namely, during launch, deorbit and early operations SpaceX seeks authority for its satellites to transmit at power levels that are 9 dB higher, or eight times, the level currently authorized. This increase in power is substantial and cannot be considered the type of “slightly higher” power that SpaceX would have the Commission believe it is.⁷

⁴ See Michael Sheetz, *SpaceX Wants to Land Starship on the Moon within Three Years, President Says, with People Soon After*, CNBC (Oct. 27, 2019, 4:51 PM), https://www.cnbc.com/2019/10/27/spacex-president-will-land-starship-on-moon-before-2022.html?__source=sharebar%7Ctwitter&par=sharebar.

⁵ See *Space Exploration Holdings, LLC*, IBFS File No. SAT-MOD-20200417-00037, Application for Modification of Authorization for the SpaceX NGSO Satellite System, Attachment A at 4 (filed Apr. 17, 2020) (“SpaceX also requests that the Commission grant authority in its modified license for communications during transition phases before and after reaching authorized positions. This would include authority to perform TT&C functions during orbit-raising and de-orbit maneuvers, as is authorized by rule for GSO satellite systems. This would also include authority for testing the Ku- and Ka-band communications payloads during the orbit-raising process, which would be conducted on a non-protected, non-harmful interference basis. Given that there are over 4,000 satellites in the constellation with a design life of five years, it is likely that SpaceX will be engaged in launch and de-orbit activities on an ongoing basis. *Granting the requested authority as part of the space station license would obviate the need for SpaceX to file – and the Commission to process – a never-ending stream of applications for special temporary authority to cover operations as satellites are raised into and de-orbited out of the constellation.*”) (emphasis supplied).

⁶ Special Temporary Authority Request, Narrative at 1-2.

⁷ *Id.* at 1.

Notably, SpaceX has not presented any interference analysis with respect to this proposed 8x power increase, and its claim that it is “unlikely” that these higher-powered transmissions “would cause any interference to other licensed users of the band”⁸ is wholly unsubstantiated. In this case, Viasat provides extremely critical applications to certain customers for whom even “occasional” random interference could be very damaging. The Commission places the burden on the applicant to provide the necessary technical analysis to substantiate a proposal to operate on a non-interference basis.⁹ SpaceX has not met that burden.

SpaceX’s proposed remedy for harmful interference resulting from its 8x power increase is equally troubling. SpaceX merely offers to take “reasonable steps to eliminate the interference.”¹⁰ Of course, SpaceX controls all aspects of its system and therefore has the sole ability to remediate harmful interference.

Consistent with Commission precedent for similar STAs issued to SpaceX for launch, early operations and deorbit, any grant of authority that may issue should require SpaceX to *cease transmissions immediately* when it is notified of interference and also require SpaceX to inform the Commission in writing of such an event.¹¹

⁸ *Id.* at 2.

⁹ *See, e.g., Rulemaking to Amend Parts 1, 2, 21 and 25 of the Commission’s Rules to Redesignate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and Fixed Satellite Services*, Third Report and Order, 12 FCC Rcd 22310 ¶ 39 (1997) (“To ensure non-interfering operations, we will require all secondary operators to submit to the Commission a technical demonstration that it can operate on a non-harmful interference basis to the type of satellite system with licensing priority. This technical demonstration will be subject to public comment before we authorize any secondary operations in the bands.”).

¹⁰ Special Temporary Authority Request, Narrative at 2.

¹¹ *See, e.g.,* Jan. 30, 2020 STA, Stamp Grant, Attachment at 2 (“In the event of any harmful interference under this grant of special temporary authority, SpaceX must immediately cease operations upon notification of such interference and inform the Commission, in writing, of such an event.”); Jan. 16, 2020 STA, Stamp Grant, Attachment at 1 (same); Nov. 7, 2019 STA, Stamp Grant, Attachment at 1 (same). In fact, *all* of SpaceX’s granted STAs for LEOP operations are subject to this condition.

3. Exceedance of EPFD Levels Is Not Justified

The equivalent power flux density (“EPFD”) limits with which SpaceX must comply are designed to ensure that SpaceX does not cause harmful interference to GSO spacecraft or terrestrial services. Under the requested STA, SpaceX has clearly articulated that it does not intend to satisfy the EPFD protection levels *all of the time*. Rather, in its own words it says: “SpaceX will *during almost all operations* observe the applicable [EPFD] limits set forth in Article 22 and Resolution 76 of the ITU Radio Regulations and the applicable power flux-density . . . limits set forth in the Commission’s rules and Article 21 of the ITU Radio Regulations.”¹² No further specificity is provided. Thus, the STA request is entirely unclear (i) at what times and under what conditions SpaceX does not intend to comply with these limits, (ii) the extent of the exceedances (in terms of power levels), and (iii) the temporal duration of the exceedances. While SpaceX “estimates” that it will send bursts of high-power transmissions for five (5) seconds most of the time, it is also clear that SpaceX reserves the ability to transmit at such levels longer and more frequently.¹³ Again, Viasat provides extremely critical applications to certain customers for whom even “occasional” randomly occurring interference could be very damaging.

This application cannot be processed without this type of complete information about the high-powered transmissions for which SpaceX seeks authority, particularly given that SpaceX has not provided an EPFD analysis or sufficient data to allow interested parties to perform their own analyses. Moreover, the proposed SpaceX approach simply is not “[c]onsistent with its

¹² Special Temporary Authority Request, Narrative at 2.

¹³ *Id.*

authorization” which requires compliance with Articles 21 and 22 and Resolution 76 *all of the time*,¹⁴ not “almost all of the time,” as SpaceX claims.¹⁵

4. Core Satellite Reliability Issues Remain Unaddressed

SpaceX has a self-reported satellite failure rate above injection altitude¹⁶ that is 2-3 times the level that it assured the Commission was “unlikely” and that it would be “nowhere near.”¹⁷ One of these reports was made just about three weeks after this STA request was filed; the other about three weeks beforehand. Notably, SpaceX has not reported the level of failures that it has experienced at injection orbit. None of these issues has been investigated or explained. In fact, neither the Commission nor interested parties are able to discern the full nature of these failures, the root causes, or whether they have any impact on SpaceX’s ability to control the communications payload on its spacecraft during the time periods in which operations would occur under this requested STA. Nor can the Commission or interested parties know from SpaceX’s STA application or its self-described “iterative design” what happens when SpaceX loses control of a satellite and whether the payload could continue transmitting on its own, and, if so, at what levels and in what direction.

Any such uncontrollable, “zombie” satellites are a concern generally and are even more of a concern in a case like this where the satellite could be transmitting at eight times the currently authorized power levels, and thus generating emissions at harmful interference levels

¹⁴ *Space Exploration Holdings, LLC, Application for Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*, Memorandum Opinion, Order, and Authorization, 33 FCC Rcd 3391 ¶ 40 (2018).

¹⁵ Special Temporary Authority Request, Narrative at 2.

¹⁶ See Letter from William M. Wiltshire, Counsel to SpaceX, to Jose P. Albuquerque, Chief, Satellite Division, FCC IBFS File No. SAT-MOD-20200417-00037, at 4-5 (filed May 15, 2020); Letter from William M. Wiltshire, Counsel to SpaceX, to Marlene H. Dortch, Secretary, FCC, at 1 (filed June 23, 2020).

¹⁷ Letter from William M. Wiltshire, Counsel to SpaceX, to Jose P. Albuquerque, Chief, Satellite Division, FCC, IBFS File No. SAT-LOA-20161115-00118, at 4 (filed Apr. 20, 2017).

toward GSO networks, NGSO systems, and terrestrial services alike. While SpaceX touts its level of disclosure when it comes to physical flight,¹⁸ SpaceX has refused to share the full nature of its satellite failures, the root causes, and the potential impact of those failures on other spacecraft—whether from a collision risk or an RF interference perspective. These are fatal shortcomings that require the Commission to seek additional information before contemplating granting this application.

¹⁸ See *Space Exploration Holdings, LLC*, IBFS File No. SAT-MOD-20200417-00037, Consolidated Opposition to Petitions and Response to Comments of Space Exploration Holdings, LLC at 14-15 (filed June 27, 2020) (“SpaceX not only shares information regarding initial deployment, ephemeris, and planned maneuvers with the 18th Space Control Squadron, but also provides all of its ephemeris data to other NGSO operators via space-track.org and other public means.”).

CONCLUSION

SpaceX has not justified its proposed eight-fold increase in power levels. Coupled with the lack of underlying analysis as to the interference threat to other systems, and SpaceX's proposal to reduce its level of responsibility with respect to interference from "cease transmission immediately" to "take all reasonable steps," there is no basis to grant this request in its current form. The Commission should deny the application or defer consideration until these issues adequately are addressed.

Respectfully submitted,

/s/

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