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

In the Matter of	)	
	)	
Space Exploration Holdings, LLC	)	File No. SAT-MOD-20200417-00037
	)	
Application for Modification of Authorization for the SpaceX NGSO Satellite System	)	Call Sign S2983/S3018
	)	

COMMENTS OF AT&T SERVICES, INC.

I. BACKGROUND AND SUMMARY

AT&T Services, Inc. ("AT&T"), on behalf of DIRECTV Enterprises LLC ("DIRECTV") and its other affiliates, hereby comments on the above-referenced application of Space Exploration Holdings, LLC ("SpaceX") (the "Third Modification").[1] Specifically, AT&T requests that the Federal Communications Commission ("Commission" or "FCC") require SpaceX to (i) demonstrate compliance with internationally-recognized EPFD limits prior to commencing operations pursuant to the Third Modification and (ii) take action to remedy any interference into Direct Broadcast Satellite ("DBS") receivers immediately upon notification. The Commission should also assess the impact of SpaceX's proposed modified operations on the aggregate interference environment that includes recently filed new and expanded non-geostationary satellite orbit ("NGSO") fixed satellite service ("FSS") systems.

DIRECTV is the largest provider of commercial Direct Broadcast Satellite ("DBS") services in the United States.[2] DIRECTV's geostationary satellite orbit ("GSO") satellite fleet

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[1] *Space Exploration Holdings, LLC Application for Modification of Authority*, File No. SAT-MOD-20200417-00037 (filed Apr. 17, 2020) ("*Third Modification*").

[2] *See* Leichtman Research Group, *Research Notes* at 6 (2Q 2020), https://www.leichtmanresearch.com/wp-content/uploads/2020/06/LRG-Research-Notes-2Q-2020.pdf.

plays a significant role in the multichannel video programming distribution ("MVPD") market, serving more than a quarter of U.S. MVPD households[3] and spurring innovation and competition.[4] AT&T has considerable interest in ensuring that SpaceX's further changes to the operating parameters of its co-frequency NGSO FSS system do not cause harmful interference to AT&T's current and future DBS service.[5]

SpaceX is no longer building the constellation that it was originally authorized in 2018 to construct and deploy under the Commission's rules.[6] SpaceX's current application to modify that authorization seeks to lower the operating altitude of an additional 2,824 satellites in its system to between 540-570 km.[7] This is the third significant modification of SpaceX's constellation requested in the two and half years since initial grant,[8] and comes only a year and a half after the first modification application.[9] To date, SpaceX has sought to modify or amend nearly every aspect of its original application—adding Ku- and Ka-band frequencies, lowering

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[3] *Id*.

[4] *See* Comments of AT&T Services, FCC IB Docket No. 06-160, at 3-4 (filed Mar. 25, 2019) (describing DIRECTV's role as a force for innovation and competition in the MVPD market, including with respect to the development of MPEG-4 video compression, advanced DVR and on-demand services, and sports coverage and programming packages). AT&T also has satellites that support backhaul and other capabilities to support wireline and wireless services in remote areas and during emergency situations. *See, e.g.,* AT&T Business, Satellite Connectivity (last visited Jul. 8, 2020) https://www.business.att.com/products/satellite-connectivity.html.

[5] The SpaceX satellites will operate in the same 12.2-12.7 GHz Ku-band and 18.3-18.6 GHz, 19.7-20.2 GHz, 28.35-28.6 and 29.5-30 GHz Ka-band frequencies as DIRECTV's GSO satellites.

[6] *See Space Explorations Holdings, LLC, Application for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*, Memorandum Opinion, Order and Authorization, FCC 18-38 (Mar. 29, 2018) ("*SpaceX Authorization*").

[7] *See Third Modification*.

[8] *See SpaceX Authorization*.

[9] *See Space Exploration Holdings, LLC Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, File No. SAT-MOD-20181108-00083 (filed Nov. 8, 2018) ("*First Modification*").

the altitude of every satellite, reconfiguring orbital spacing, and launching several different satellite designs. This continuous redesign of a large NGSO FSS constellation creates considerable uncertainty for incumbent, co-frequency GSO operators and has the potential to impact service for millions of DBS customers.

As required by Section 25.146(c) of the FCC's rules, the Commission should not permit SpaceX to commence operations under this proposed Third Modification until the ITU-BR issues a finding on SpaceX's compliance with EPFD limits designed to protect co-frequency GSO services.[10] In addition, to ensure continuing protection of DBS operations in real-world scenarios, the Commission should condition any grant of the Third Modification on SpaceX immediately taking action to remedy any interference into DBS receivers upon notification. Finally, the Commission should consider the impact of SpaceX's proposed modified system on the aggregate interference environment that includes recently filed new and expanded NGSO FSS systems.[11]

II. THE COMMISSION SHOULD ENSURE GSO PROTECTIONS BY REQUIRING EPFD VALIDATION PRIOR TO SPACEX COMMENCING NGSO FSS OPERATIONS UNDER THE THIRD MODIFICATION

Both FCC and ITU regulations for spectrum sharing among GSO and NGSO FSS systems require NGSO FSS systems that operate in bands shared with GSO FSS and GSO Broadcast Satellite Service ("BSS") networks to meet a single-entry EPFD limit and to ensure that the aggregate interference into those GSO FSS and BSS systems remain below the aggregate power levels in Resolution 76 (WRC-2000).[12] Section 25.146(c) requires NGSO FSS operators

[10] 47 C.F.R. § 25.146(c); ITU Radio Regulations, Art. 22.

[11] *See infra* section IV.

[12] 47 C.F.R. § 25.146(d); ITU Radio Regulation, Art. 22; *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, First Report and Order and Further Notice

to receive an ITU-BR finding of "favourable" or "qualified favourable" *prior* to commencing operations.[13] As the Commission has previously explained, an NGSO FSS system must "demonstrate prior to licensing that it meets the validation $EPFD_{down}$ limits *to protect GSO BSS operations*."[14] Simply put, it is "imperative that NGSO FSS compliance with the single-entry validation $EPFD_{down}$ limits be verified during the…licensing process."[15]

Each time SpaceX proposes a modification to its constellation affecting bands shared with GSO services, the resulting fluctuations in its EPFD levels directly impact DBS operations. Thus, to demonstrate that its proposed modification will not cause harmful interference into GSO DBS systems, SpaceX must obtain another ITU-BR determination of its constellation redesign validating its single-entry EPFD limits *prior* to commencing any operations associated with this Third Modification.[16]

Requiring SpaceX to comply with Section 25.146(c) before commencing operations as requested in the Third Modification serves the public interest by protecting incumbent services without countervailing harm. The original SpaceX launch authorization was similarly conditioned on SpaceX receiving a "favourable" or "qualified favourable" finding in accordance with Resolution 85 prior to the initiation of service.[17] The waiver granted by the Commission to facilitate SpaceX's rapid deployment schedule was granted in the context of a partial

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of Proposed Rule Making, 16 FCC Rcd 4096, ¶ 172 (2000) ("*First Ku-Band NGSO R&O*") ("We find that the single-entry and aggregate $EPFD_{down}$ limits we are adopting will not unduly hinder the growth of BSS.")

[13] 47 C.F.R. § 25.146(c).

[14] *First Ku-Band NGSO R&O*, at ¶ 191 (emphasis added).

[15] *Id*.

[16] To date, SpaceX has only received a determination on the Ku-band portion of its first two modifications. The Ka-band determination is still pending. *See* ITU-BR, STEAM 1, CR/C/3739 MOD 5 (May 12, 2020).

[17] *SpaceX Authorization*, at Condition n.

modification of its constellation.[18] The Third Modification, by contrast, is a holistic system design change more akin to an initial authorization and should require a demonstration that the changes will not cause an increase in interference to co-frequency GSO systems prior to commencing operations on the completely reconfigured constellation.

In this instance, adherence to Section 25.146(c) will not prevent SpaceX from providing service even if validation at the ITU-BR is slow. [19] SpaceX appears to have a sufficient number of satellites in orbit to begin beta testing.[20] It anticipates soon having enough satellites to begin providing a basic level of service to limited portions of the United States, Canada, and other northern latitudes.[21] Adherence to the rule will not prevent SpaceX from completing the deployment of 1,584 satellites in accordance with its first two modifications.[22] Thus, deferring consideration of SpaceX's Third Modification pending a determination from the ITU-BR will not delay initiation of SpaceX service. In contrast, operation of satellites as proposed in the

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[18] *Space Exploration Holdings, LLC Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization, File No. SAT-MOD-20181108-00083, at ¶ 28 (Apr. 26,2019) ("*First Modification Grant*").

[19] As SES/O3b previously noted, SpaceX has even created its own backlog by filing 20 separate ITU filings on Oct. 7, 2019 to be evaluated in connection with its NGSO system. *See* Petition to Defer of SES Americom, Inc. and O3b Limited, File No. SAT-MOD-20190830-00087 (Oct. 15, 2019). These filings will all need to be processed ahead of any further application to modify the constellation associated with this Third Modification.

[20] Following the successful launch of the seventh tranche of Starlink satellites, CEO Elon Musk tweeted "Private beta begins in ~3 months, public beta in ~6 months, starting with high latitudes." Elon Musk, @elonmusk, Twitter (Apr. 22, 2020) https://twitter.com/elonmusk/status/1253115727965491202.

[21] *See* Comments of Space Exploration Holdings LLC, GN Docket No. 20-60, at 2 (Apr. 27, 2020) (stating that "[a]t its current launch cadence, SpaceX anticipates that before the end of 2020 it will begin offering commercial service in the northern United States and southern Canada, and then will rapidly expand to near global coverage of the populated world in 2021.")

[22] *See generally*, *First Modification Grant*; *Space Exploration Holdings, LLC Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization, File No. SAT-MOD-20190830-00087 (Dec. 19,2019) ("*Second Modification Grant*").

Third Modification prior to a validation of compliance with EPFD limits has the potential to disrupt service to tens of millions of U.S. customers.

III. THE COMMISSION SHOULD IMPOSE A CONDITION REQUIRING SPACEX TO REMEDY ANY INTERFERENCE TO DBS

The Commission should also adopt a condition requiring SpaceX to take immediate action to protect DBS licensees in the event of actual interference. NGSO FSS operators making significant, repetitive modifications creates uncertainty in the interference environment and thus they should be required to protect incumbent DBS operations from *any* increases in interference that result from those changes. Even minimal increases in the single-entry EPFD contributions of an NGSO FSS operator can have detrimental effects on the operations of co-frequency DBS operations and therefore must be proactively avoided, protected, and remedied. Thus, the Commission should require that upon receipt of a notification from a DBS operator of actual interference into DBS receivers, SpaceX will reduce emissions accordingly until the interference is resolved.

IV. THE COMMISSION SHOULD CONSIDER THE IMPACT OF THE SPACEX THIRD MODIFICATION ON AGGREGATE EMISSIONS ALONG SIDE THE CURRENT PROCESSING ROUND APPLICANTS

Finally, SpaceX's proposed modification cannot be considered in a vacuum. On March 24, 2020, the Commission announced that it would accept a second round of NGSO FSS applications in the Ku- and Ka-bands.[23] Before any of these proposed second round systems can commence operations, they will also need to demonstrate compliance with the Commission's EPFD requirements in Section 25.146, factoring in existing NGSO FSS operations in the band,

[23] *See* Satellite Policy Branch Information, Cut-Off Established for Additional NGSO FSS Applications or Petitions for Operations in the 10.7-12.7 GHz, 12.75-13.25 GHz, 13.8-14.5 GHz, 17.7-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz Bands, Report No. SPB-279, DA 20-325 (Mar. 24, 2020).

to protect co-frequency GSO operations.[24] Any determination of SpaceX's "fair share" of aggregate NGSO emissions for its redesigned constellation must be considered alongside the other pending applications. To accurately do so requires that SpaceX's Third Modification be included as part of the discussion surrounding the attribution of interference into the aggregate by the March 2020 processing round participants. Any other result would be inequitable because the ability of second processing round participants to consider aggregate emissions issues requires current NGSO FSS licensees to maintain their constellations, and therefore their emission levels, in a fixed state.

The ITU-BR is currently able to provide a "favourable" or "qualified favourable" finding with respect to an NGSO system's *single-entry* EPFD limits, but not aggregate EPFD limits, to protect GSO operators. Accordingly, there is a real-world interference risk to DBS operators introduced by multiple NGSO systems. This risk is exacerbated when large NGSO systems, such as SpaceX's, undergo significant modifications altering the interference environment. Therefore, the Commission should require SpaceX to assess the impact of its modification on the new aggregate interference environment.[25]

[24] 47 C.F.R. § 25.146(c).

[25] Currently the Commission "require[s] NGSO FSS licensees to comply with existing aggregate EPFD limits as well, and may intervene if operators cannot agree among themselves how to ensure the aggregate limits are met." *See Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, IB Docket No. 16-408, FCC 17-122, at ¶ 35 (Sep. 27, 2017).

V. CONCLUSION

AT&T respectfully requests that the FCC require SpaceX to receive a "favourable" or "qualified favourable" determination from the ITU-BR *prior* to commencing operations requested in the Third Modification, as well as impose a condition requiring SpaceX to take immediate action to protect DBS receivers upon notification of actual interference. The Commission should also consider the impact of the SpaceX Third Modification on aggregate emissions as part of the current NGSO FSS processing round.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that, on this 13th day of July 2020, a copy of the foregoing Comments was served via First Class mail upon:

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