ORAL ARGUMENT SCHEDULED FOR DEC. 3, 2021
No. 21-1123 (and consolidated cases 21-1125, 21-1127, 21-1128)

IN THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

VIASAT, INC.,
Appellant,
v.
FEDERAL COMMUNICATIONS COMMISSION,
Appellee/Respondent,
UNITED STATES OF AMERICA,
Respondent,
SPACE EXPLORATION HOLDINGS, LLC,
Intervenor.

On Notices of Appeal and Petition for Review of an Order of the Federal Communications Commission

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FINAL BRIEF FOR APPELLEE/RESPONDENT FEDERAL COMMUNICATIONS COMMISSION AND RESPONDENT THE UNITED STATES OF AMERICA

Richard A. Powers
Acting Assistant Attorney General, Antitrust Division

Todd Kim
Assistant Attorney General, Environment and Natural Resources Division

Robert B. Nicholson
Robert B. Wiggers
Justin Heminger
Allen Brabender
Attorneys

U.S. DEPARTMENT OF JUSTICE
950 Pennsylvania Ave. NW
Washington, DC 20530

P. Michele Ellison
Acting General Counsel

Jacob M. Lewis
Associate General Counsel

James M. Carr
Rachel Proctor May
Counsel

FEDERAL COMMUNICATIONS COMMISSION
45 L Street NE
Washington, DC 20554
(202) 418-1740
fcclitigation@fcc.gov

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

(A) **Parties and Amici.** All parties, intervenors, and *amici* appearing in this Court are listed in the Brief for Viasat, Inc. and the Balance Group, except for *amicus curiae* Professor Andy Lawrence, who filed a brief in support of Appellants/Petitioners on August 13, 2021.

(B) **Rulings Under Review.** The appeals and petition challenge the following order of the Federal Communications Commission: Order and Authorization and Order on Reconsideration, *Space Exploration Holdings, LLC*, 36 FCC Rcd. 7995 (2021), *reprinted at* JA0014–0070.

(C) **Related Cases.** The Federal Communications Commission and United States of America are aware of no other related cases within the meaning of D.C. Circuit Rule 28(a)(1)(C).

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GLOSSARY

DBS	Direct Broadcast Satellite
FCC	Federal Communications Commission
ITU	International Telecommunications Union
NEPA	National Environmental Policy Act

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INTRODUCTION

Communications satellites play a critical role in delivering Internet service to remote areas, where it is difficult and expensive to build terrestrial communications networks. In 2018, the Federal Communications Commission ("FCC" or "Commission") authorized

Space Exploration Holdings, LLC ("SpaceX") to operate 4,425 such satellites, which SpaceX has begun to deploy as part of a communications network branded "Starlink."

In the *Order* on appeal, the Commission modified Space X's license to permit it to operate 2,824 of its satellites at a lower altitude than originally approved—540 to 570 kilometers above the Earth's surface. *Space Exploration Holdings, LLC*, Order and Authorization and Order on Reconsideration, 36 FCC Rcd. 7995, 2021 WL 1676348 (Apr. 27, 2021) ("*Order*") (JA0014-0070). The Commission concluded that the modification served the public interest because it would improve broadband access in remote and underserved areas, and because lowering the altitude would help mitigate the potential that SpaceX satellites would collide with other objects and create orbital debris.

This case involves two separate challenges to the Commission's order.

DISH Network Corporation ("DISH"), a satellite operator, challenges the Commission's conclusion that SpaceX will not cause harmful interference to DISH's operations. But, as we show, the

Commission properly rejected DISH's claim of harmful interference on the basis of SpaceX's certification that its operations would not cause such interference. SpaceX's certification employed an analysis using software developed and approved by the International Telecommunications Union ("ITU") (and accepted by the Commission under its rules) for assessing harmful interference. DISH maintains that the Commission should have instead relied on interference studies DISH put into the record that did not use the ITU-approved methodology, and therefore did not comply with the Commission's rules.

Viasat, Inc. ("Viasat"), a satellite operator, and the Balance Group, a research and advocacy organization, assert that the National Environmental Policy Act ("NEPA") required the Commission to conduct additional environmental review of the satellites covered by the *Order*. Neither Viasat nor the Balance Group has demonstrated an injury that satisfies Article III's standing requirements and is within NEPA's zone of interests. In any event, their arguments fail on the merits.

Under the Commission's rules implementing NEPA, satellite authorizations fall into a categorical exclusion from further

environmental review. 47 C.F.R. §§ 1.1306(a), 1.1307; *see* 40 C.F.R. § 1501.4(b). Such review is therefore required only if the potential effects of such an authorization may be "significant." 47 C.F.R. § 1.1307(c). In this case, the Commission reasonably concluded that the record did not show potential significant effects from the modification of SpaceX's license that would require additional review.

In disputing this conclusion, Viasat and the Balance Group largely rely on evidence discussing the potential environmental effects of operations by multiple commercial satellite and space transport providers, as well as SpaceX satellites not at issue in this proceeding. But the *Order* under review simply authorizes a change in the orbital altitude of a subset of SpaceX's satellites. The Commission reasonably concluded that the record did not show that the effects of that action had the potential to be significant, particularly given the conditions it had placed on SpaceX's operations and the commitments the company had made.

The *Order* should be affirmed.

JURISDICTIONAL STATEMENT

This Court has jurisdiction over these consolidated appeals pursuant to 47 U.S.C. § 402(b)(6). The Commission issued the *Order* on April 27, 2021. Appellants filed timely notices of appeal within 30 days of the *Order*'s release. *See* 47 U.S.C. § 402(c); 47 C.F.R. § 1.4(b)(2).[1]

STATEMENT OF THE ISSUES

1. Whether the Commission reasonably accepted SpaceX's certification, based on an application of the ITU's validation software, that SpaceX's service complies with the ITU's power limits and will not cause harmful interference to other satellite services.

2. Whether the Commission reasonably waived the requirement that SpaceX receive a favorable finding from the ITU prior to initiating service.

3. Whether either Viasat or the Balance Group has Article III standing and is within NEPA's zone of interests.

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[1] Viasat in No. 21-1125 also filed a protective petition for review of the *Order* pursuant to 47 U.S.C. § 402(a). Because sections 402(a) and 402(b) are "mutually exclusive" jurisdictional provisions, the Court should dismiss No. 21-1125. *See Sprint Nextel Corp. v. FCC*, 524 F.3d 253, 256 n.4 (D.C. Cir. 2008).

4. Whether the Commission reasonably concluded that SpaceX's modification did not present the potential for a significant environmental impact that required further NEPA review.

PERTINENT STATUTES AND REGULATIONS

Pertinent statutes and regulations are set forth in a separately bound statutory addendum.

COUNTERSTATEMENT OF THE CASE

I. STATUTORY AND REGULATORY BACKGROUND

A. Licensing Of Satellite Communication Services

The Communications Act authorizes the FCC to "grant construction permits and station licenses, or modifications or renewals thereof, only upon written application." 47 U.S.C. § 308(a). Pursuant to this authority, the Commission reviews license applications for communications satellites, which are referred to as "space stations" under the Commission's rules. *See Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428 (D.C. Cir. 1991); 47 C.F.R. § 25.114. The Commission "shall grant" any "such application" if it finds that the "public interest, convenience, and necessity would be served by the granting thereof." 47 U.S.C. § 309(a).

The Commission has broad authority to modify licenses for satellite communication services "if in the judgment of the Commission such action will promote the public interest, convenience, and necessity." *See PSSI Global Servs., LLC v. FCC*, 983 F.3d 1, 7-10 (D.C. Cir. 2020) (quoting 47 U.S.C. § 316(a)(1)). "Applications for modifications of space station authorizations will be granted" by the Commission "except under [certain specified] circumstances," including when "[g]ranting the modification request would not serve the public interest, convenience, and necessity." 47 C.F.R. § 25.117(d)(2)(ii).

In assessing whether a license modification will serve the public interest, the Commission considers whether the proposed modification will cause "harmful interference" to other communication services. *See Globalstar, Inc. v. FCC*, 564 F.3d 476, 482-83, 486-88 (D.C. Cir. 2009); *Teledesic LLC v. FCC*, 275 F.3d 75, 79-80 (D.C. Cir. 2001). The Commission and its staff have found that if a "proposed modification does not present any significant interference problems and is otherwise consistent with Commission policies, it is generally granted." *Teledesic, LLC*, 14 FCC Rcd. 2261, 2264 ¶ 5 (Int'l Bur. 1999); *see also Order* ¶ 8 (JA0023).

FCC rules define "harmful interference" as "[i]nterference which endangers the functioning of a radionavigation device or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with" the "Radio Regulations" of the ITU. 47 C.F.R. § 2.1(c). The ITU, a specialized agency of the United Nations, is primarily responsible for implementing the coordination procedures adopted in the Radio Regulations for international satellite operations to guard against harmful interference. *See Spectrum Five LLC v. FCC*, 758 F.3d 254, 255-57 (D.C. Cir. 2014). This includes evaluating all satellite network filings for compliance with the Radio Regulations' equivalent power flux density limits. Those limits were incorporated in the FCC's rules.

The technical requirements for preventing harmful interference vary based on whether the satellite communication service is provided via geostationary satellites or non-geostationary satellites. Geostationary satellites "remain in fixed positions relative to the earth," while non-geostationary satellites "continuously circle the earth." *Northpoint Tech., Ltd. v. FCC*, 412 F.3d 145, 155 (D.C. Cir. 2005). The FCC has categorized some non-geostationary satellite services as "fixed-

satellite" services because they transmit signals to earth stations at fixed locations. Systems providing non-geostationary fixed-satellite services include "space stations in a satellite constellation," such as those in SpaceX's system. *Amend. 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*, 16 FCC Rcd. 4096, 4099 n.4 (2000) (*2000 Order*).

Non-geostationary fixed-satellite services, such as the service SpaceX proposes to offer, are allowed to "share spectrum with incumbent services without causing unacceptable interference to them." *2000 Order*, 16 FCC Rcd. at 4099 ¶ 1. To engage in such spectrum sharing, non-geostationary fixed-satellite services must comply with the "equivalent power flux density" limits established by the ITU. *See id*. at 4100 ¶ 2. Broadly speaking, equivalent power flux density is a measure of the total power being directed by a non-geostationary satellite service toward a geostationary satellite or an earth station receiving geostationary satellite transmissions.[2] The ITU's equivalent power flux

[2] *See* 47 C.F.R. § 25.103 (defining power flux density as "[t]he amount of power flow through a unit area within a unit bandwidth"); *see ibid*. (defining equivalent power flux density as "[t]he sum of the

density limits were designed to prevent non-geostationary satellite services from causing harmful interference to geostationary satellite services such as direct broadcast satellite (DBS) services of the kind provided by DISH.

DBS "uses satellites in geostationary orbits to transmit multiple channels of video programming" over the 12.2-12.7 GHz band to "satellite dishes located at the premises of subscribers." *DIRECTV, Inc. v. FCC*, 110 F.3d 816, 821 (D.C. Cir. 1997). Two decades ago, the FCC concluded that if non-geostationary fixed-satellite services conformed to the ITU's equivalent power flux density limits, they could share the 12.2-12.7 GHz band with DBS services without causing harmful interference to DBS operations. *2000 Order*, 16 FCC Rcd. at 4159-72 ¶¶ 162-198. No party sought judicial review of this determination.[3]

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power flux densities produced at a geostationary-orbit receive earth or space station … by all the transmit stations within a non-geostationary orbit Fixed-Satellite Service system").

[3] In the same order, the FCC also concluded that multichannel video distribution and data services could use the 12.2-12.7 GHz band without causing harmful interference to DBS services. *2000 Order*, 16 FCC Rcd. at 4177-80 ¶¶ 213-218. Some DBS providers—including Echostar, which was then DISH's parent company—argued that this finding was unjustified. *See Northpoint Tech., Ltd. v. FCC*, 414 F.3d 61, 68-71 (D.C. Cir. 2005). This Court disagreed, holding that "the

In 2017, the Commission revised its rules governing non-geostationary fixed-satellite services. *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, 32 FCC Rcd. 7809 (2017) (*2017 Order*). Two of those revisions are relevant here.

First, the Commission incorporated by reference the equivalent power flux density limits set forth in Article 22 of the ITU's Radio Regulations. The Commission found it unnecessary "to restate" the ITU's power limits "in [the FCC's] rules." *2017 Order*, 32 FCC Rcd. at 7822 ¶ 42.

Second, in light of newly developed "validation software" that the ITU uses "to assess compliance with" its power limits, the Commission found that compliance review by FCC staff "would duplicate that performed by the ITU Radiocommunication Bureau" and needlessly add "a few months" to the licensing process. *2017 Order*, 32 FCC Rcd. at 7822 ¶ 41. To eliminate any such delay, the amended rules "simply

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Commission had a rational basis for concluding that [multichannel video distribution and data service] providers could share the 12 GHz bandwidth without causing 'harmful interference' to DBS service providers." *Id.* at 68; *see also id.* at 71 ("the Commission took adequate steps to prevent harmful interference from occurring").

require [non-geostationary fixed-satellite service] applicants to certify that they will meet" the ITU's equivalent power flux density limits. *Ibid.*; *see* 47 C.F.R. § 25.146(a). The rules also require that before a licensed operator initiates non-geostationary fixed-satellite service, it "must receive a 'favorable' or 'qualified favorable' finding by the ITU Radiocommunication Bureau." 47 C.F.R. § 25.146(c). The operator must submit the ITU's finding to the FCC, along with the input data files used for the ITU validation software. *Id.* § 25.146(c)(1)-(2).

No party sought judicial review of the *2017 Order*.

B. The National Environmental Policy Act (NEPA)

NEPA is a procedural statute that requires agencies to consider the environmental impact of proposed major federal actions. *DOT v. Pub. Citizen*, 541 U.S. 752, 756-57 (2004). NEPA "does not dictate particular decisional outcomes, but merely prohibits uninformed—rather than unwise—agency action." *United Keetoowah Band of Cherokee Indians in Oklahoma v. FCC*, 933 F.3d 728, 734 (D.C. Cir. 2019).

NEPA is implemented through regulations promulgated by the Council on Environmental Quality.[4] The regulations require agencies to determine an "appropriate level of NEPA review" based on the potential significance of environmental effects. 40 C.F.R. § 1501.3(a). Agencies are to prepare an "environmental impact statement" for actions that are likely to have a significant effect, or an "environmental assessment" for actions that may have a significant effect. *Id.* § 1501.3(a)(2)-(3). "For efficiency," the regulations also provide that agencies "shall identify in their agency NEPA procedures . . . categories of actions that normally do not have a significant effect on the human environment and therefore do not require preparation of an environmental assessment or environmental impact statement." *Id.* § 1501.4(a). Such "[c]ategorical exclusions are not exemptions or

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[4] The Council on Environmental Quality has updated the NEPA regulations at 40 C.F.R. Parts 1500–1508. *See* 85 Fed. Reg. 43,304 (July 16, 2020). This brief cites the new regulations, as well as the FCC's complementary internal NEPA regulations that predate the updates. Both were in effect when the *Order* was adopted. More recently, the Council has announced its plans to change the updated regulations. Spring 2021 Unified Agenda, RIN 0331-AA05, https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202104&RIN=0331-AA05; Spring 2021 Unified Agenda, RIN 0331-AA07, https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202104&RIN=0331-AA07.

waivers of NEPA review; they are simply one type of NEPA review." *United Keetoowah*, 933 F.3d at 735.

When a categorical exclusion applies, further review may still be necessary if there exist "extraordinary circumstances" in which "a normally excluded action may have a significant effect." 40 C.F.R. § 1501.4(b). In determining whether the effects of the proposed action are "significant," "agencies shall analyze the potentially affected environment and degree of the effects of the action." *Id.* § 1501.3(b). Further review is not required if "there are circumstances that lessen the impacts or other conditions sufficient to avoid significant effects." *Id.* § 1501.4(b)(1).

The Commission's rules implementing NEPA categorically exclude all proposed actions unless they fall into specific categories that require additional environmental review. 47 C.F.R. §§ 1.1306, 1.1307. In adopting the rules, the Commission "coordinated with [the Council on Environmental Quality] to assure compliance with [NEPA] requirements." Report and Order, *Amend. of Env't Rules in Response to New Reguls. Issued by the Council on Envtl. Quality*, 60 Rad. Reg. 2d (P & F) 13 ¶ 3, 1986 WL 292182 (Mar. 26, 1986); *see also* 40 C.F.R.

§ 1507.3(a) ("the categorical exclusions contained in agency NEPA procedures as of September 14, 2020 are consistent with" Council on Environmental Quality NEPA regulations). "[S]pace stations" such as the SpaceX satellites covered by the *Order* "generally have not triggered these categories and therefore have been categorically excluded from [further] review" under the Commission's NEPA regulations.[5] *Order* ¶ 72 (JA0055).

The Commission's rules allow an "interested person" to allege that an otherwise excluded action may have a significant environmental effect that justifies further review by submitting a petition "setting forth in detail the reasons justifying or circumstances necessitating environmental consideration in the decision-making process." 47 C.F.R. § 1.1307(c). The responsible bureau shall "review the petition and consider the environmental concerns that have been raised," but will require additional review only if it "determines that the action may have a significant environmental impact." *Ibid.*

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[5] As the *Order* explains, this proceeding raised "novel questions" regarding whether the environmental "issues raised by the[] parties are within the scope of NEPA," although the Commission "assume[d] that NEPA may apply" for purposes of its analysis. *Order* ¶ 77 (JA0056); *see infra* at 26.

C. The Commission's Orbital Debris Rules

Satellites can generate "orbital debris" by colliding with other objects in space (including debris from previous collisions), and must be disposed of safely at the end of their useful lives. In 2004, the Commission adopted "comprehensive rules on orbital debris" "[p]ursuant to its authority to determine whether the public interest would be served by the authorization of satellite communications systems" under 47 U.S.C. § 307(a). *Mitigation of Orbital Debris in the New Space Age*, 33 FCC Rcd. 11352 ¶ 4 (2018). "The core of these rules consists of disclosure requirements that yield information critical to the Commission's overall determination of whether the public interest will be served by approving the proposed operations." *Ibid.*

That information includes operators' strategies to mitigate the risk of orbital debris, 47 C.F.R. § 25.114(d)(14)(iii), including the potential risk of collision with large debris or other satellites, *ibid.*, and their plans to dispose of the satellites at the end of their useful lives, *id.* § 25.114(d)(14)(iv). Because disposal is often achieved through reentry into the Earth's atmosphere, the rules also address the human

"casualty risk" that may be presented if satellites do not fully "demise" during reentry and reach the Earth's surface. *Ibid.*[6]

D. Authorization of SpaceX's Satellite Service

1. The *Authorization Order*

In 2016, SpaceX filed an application with the FCC for authorization to provide non-geostationary fixed-satellite service over a system "comprising 4,425 satellites in 83 orbital planes, at an approximate altitude of 1,110 to 1,325 kilometers." *Space Exploration Holdings, LLC*, 33 FCC Rcd. 3391, 3392 ¶ 2 (2018) ("*Authorization Order*"). The proposed service would "bring high-speed, reliable, and affordable broadband service to consumers in the United States and around the world, including areas underserved or currently unserved by existing networks." *Id.* at 3391-92 ¶ 1. SpaceX proposed to operate "in the 10.7-12.7 GHz, 13.85-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-

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[6] In 2018, the Commission initiated a "comprehensive update" of its orbital debris rules, and adopted revised rules in 2020. Report and Order and Further Notice of Proposed Rulemaking, *Mitigation of Orbital Debris in the New Space Age*, 35 FCC Rcd. 4156 ¶¶ 5, 12 (2020). The updated rules still require disclosure of orbital debris mitigation plans and casualty risk. *See id.* ¶¶ 34, 96, 119-20. They are subject to review under the Paperwork Reduction Act and have not yet taken effect.

29.1 GHz, and 29.5-30 GHz bands." *Id.* at 3392 ¶ 2. After SpaceX's application was accepted for filing, SpaceX filed a supplemental application requesting "the addition of the 12.75-13.25 GHz, 19.7-20.2 GHz and 29.3-29.5 GHz bands." *Ibid.* ¶ 3.

Competing satellite operator Viasat filed a petition to deny SpaceX's application, citing interference concerns. *Id.* at 3393 ¶ 4 & n.13. Other satellite operators filed comments expressing concerns about SpaceX's plans for mitigating orbital debris. *Ibid.* ¶ 4 & n.15. DISH did not participate in the proceeding.

After reviewing the record, the Commission concluded that "grant" of SpaceX's application, "as supplemented, will serve the public interest, subject to [certain] requirements and conditions." *Id.* at 3395 ¶ 7. Among other things, the Commission conditioned grant of the application "on SpaceX receiving a favorable or 'qualified favorable' rating of its [equivalent power flux density] demonstration by the ITU prior to initiation of service." *Id.* at 3395-96 ¶ 9. The Commission also noted that the large number of satellites proposed by SpaceX and "other" satellite operators that were seeking approval "will necessitate a further assessment of the appropriate reliability standards of these

spacecraft, as well as the reliability of these systems' methods for deorbiting the spacecraft." *Id.* at 3398 ¶ 15. It therefore conditioned grant of the application "on the Commission's approval of an updated description of the orbital debris mitigation plans for [SpaceX's] system," *ibid.*, and required SpaceX to "comply with any new orbital debris requirements" adopted in the future, *id.* at 3399 ¶ 17.

2. The *First Modification Order*

In November 2018, SpaceX filed an application asking the Commission to modify its authorization to allow SpaceX to relocate 1,584 satellites authorized to operate at an altitude of 1,150 km to operate at an altitude of 550 km. *Space Exploration Holdings, LLC*, 34 FCC Rcd. 2526, 2526 ¶ 2, 2019 WL 1915582 (Int'l Bur. 2019) ("*First Modification Order*").

After reviewing comments on the proposed modification and petitions to deny the application, the FCC's International Bureau ("Bureau") granted the application. It found that "the modification proposed by SpaceX" did "not present significant interference problems" and was "in the public interest." *Id.* ¶ 11. The Bureau concluded that granting the modification would "allow SpaceX to make efficient use of

valuable spectrum resources more safely, quickly, and cost-effectively as it initiates a new generation of broadband services available to customers worldwide, including those in areas previously underserved or even totally unserved by other broadband solutions." *Id.* ¶ 1.

In the order, the Bureau granted "SpaceX's request for waiver of the requirement" under the FCC's rules that SpaceX "receive a favorable or 'qualified favorable' finding" from the ITU "prior to commencing operations." *Id.* ¶ 28; *see* 47 C.F.R. § 25.146(c). The Bureau agreed with SpaceX that compliance with this requirement would disrupt SpaceX's "expedited deployment schedule" and substantially delay the start of service. *First Modification Order* ¶ 28. While the waiver permitted SpaceX to commence operations before obtaining a favorable finding from the ITU, SpaceX was still required to request such a finding from the ITU after the initiation of service. In the event of a subsequent "unfavorable finding" by the ITU, SpaceX must "adjust its operation to satisfy the ITU requirements." *Ibid.* The Bureau emphasized that "operations of SpaceX's system, as modified prior to the ITU's finding, are at SpaceX's own risk." *Ibid.*

The Bureau also found that SpaceX's "orbital debris mitigation plan" was "sufficient with regard to the space stations that SpaceX proposes to operate under its modification … at an altitude of 550 km." *Id.* ¶ 27. SpaceX had provided a "detailed discussion of how it will avoid potential collisions" by explaining that "its satellites have propulsion and SpaceX will maintain the ability to maneuver the satellites to avoid collisions," which means that the collision risk is considered to be "zero, or near zero, during the time in which the satellite is maneuverable," and "[n]o contrary information was provided by any party." *Id.* ¶ 22. The Bureau further concluded that the "estimate of the collision risk in the event of a system failure that renders a satellite incapable of maneuvering . . . is well within accepted boundaries for collision risk, even with worst-case assumptions that go well beyond any realistic scenario." *Ibid.*

The *First Modification Order* also addressed the potential casualty risk resulting from portions of satellites surviving reentry. The Bureau explained that SpaceX had "developed a system architecture such that satellite components will be completely demisable in all versions except for the initial deployment of no more than 75 satellites." *Id.* ¶ 25.

Because "no components of . . . the satellite will survive atmospheric re-entry" under the revised architecture, the Bureau concluded that "casualty risk" had been reduced to "zero." *Ibid.* The Bureau conditioned the modification "on the requirement that SpaceX comply with any rules or policies that result from the orbital debris proceeding and any other applicable proceeding, now or in the future." *Id.* ¶ 22. Because the plan addressed only satellites at 550 km, the Bureau also required SpaceX to "submit, and have approved by the Commission, an updated orbital debris plan" for satellites at other altitudes "prior to the initiation of service." *Id.* ¶ 27.

E. The *Order* on Review

In April 2020, SpaceX applied to modify the altitude of the remaining 2,824 satellites to 540-570 km and to make other operational changes.[7] *Order* ¶ 4 (JA0016). The Commission analyzed the application in light of Bureau-level precedent for determining whether the application is in the "public interest," which considers whether the proposed modification "present[s] any significant interference problems

[7] The Commission authorized SpaceX to launch ten of these satellites in January 2021. *See Order* ¶ 6 & n.38 (JA0022).

and is otherwise consistent with Commission policies." *Id.* ¶ 8 (JA0023). The Commission found that the modification will "serve the public interest" in several ways. *Id.* ¶ 13 (JA0024), s*ee also id.* ¶¶ 8-12 (citing 47 C.F.R. § 25.117(d)(2)(ii)) (JA0023-JA0024). It will "improve service to remote and underserved areas," such as Alaska, which suffers from a "scarcity of reliable internet service" that, even when available, is "extreme[ly] expens[ive]." *Id.* ¶¶ 7, 9 (JA0023). It will "have beneficial effects with respect to orbital debris mitigation," because "deployment to a lower altitude guarantees removal of satellites from orbit within a relatively short period of time." *Id.* ¶¶ 9, 12, 13 (JA0023, JA0024). The Commission also concluded that modification "will not present significant interference problems." *Id.* ¶ 13 (JA0024). It granted SpaceX's requested modification, subject to conditions.

1. Interference Issues

The *Order* rejected arguments by several providers that the modification will cause interference with their systems. As relevant here, it rejected DISH's argument that the modified system will cause interference for customers of direct broadcast satellite services on the 12.2-12.7 GHz band. *Order* ¶ 35 (JA0037). DISH based its contention

on a "technical study" that purportedly demonstrated that "SpaceX's proposed modification would exceed applicable [equivalent power flux density] limits in the 12.2-12.7 GHz band." *Id.* ¶ 37 (JA0038). This is so, DISH argued, because SpaceX's analysis used an "incorrect assumption" that its system has an "Nco factor of one," meaning that "only one satellite beam will transmit to a given spot on the Earth's surface at a time."[8] *Ibid.* DISH also argued that its analysis showed that even with an "Nco value of one, SpaceX's system will exceed the [equivalent power flux density] limits in the 12.2-12.7 GHz band." *Id.* ¶ 38 (JA0038-0039). In response, SpaceX explained that "an Nco value of one . . . reflects the way SpaceX in fact has operated its system and the method by which it will continue to operate its system in the future," and that "the methodology DISH uses in this analysis to show SpaceX will exceed the [equivalent power flux density] limits with an Nco value of one is not ITU-approved." *Id.* ¶¶ 37-38 (JA0038-0039).

[8] Nco is "a factor used in ITU [equivalent power flux density] analysis to represent the number of co-frequency, co-polarization satellite beams transmitting to a given point on the Earth's surface simultaneously." *Order* ¶ 37 (JA0038).

The Commission concluded that "[a] certification of compliance with [equivalent power flux density] limits is what is required by our rules, and we are satisfied with SpaceX's certification that it will not violate ITU [equivalent power flux density] limits relevant to the 12.2-12.7 GHz band." *Id.* ¶ 39 (JA0039). The Commission rejected DISH's argument that SpaceX could not meet the equivalent power flux density limits, explaining that the argument was "based on [DISH's] own analysis," but that "the relevant analysis under the Commission's rules is analysis using ITU-approved software." *Id.* ¶ 40 (JA0040).

The Commission declined to revoke the waiver of Section 25.146(c) that it had granted in the *First Modification Order*, and accordingly "[continued] to condition this grant consistent with the prior modifications to require SpaceX to provide the underlying data for its [equivalent power flux density] analysis to any interested party." *Id.* ¶ 41 (JA0040). It granted DISH's request to make the approval subject to the condition that SpaceX "not use more than one satellite beam from any of its satellites in the same frequency in the same or overlapping areas at a time." *Id.* ¶ 39 (JA0039).

The Commission also rejected an argument that SpaceX's modification application should be treated as a "newly filed application" and considered part of the 2020 processing round. *Id.* ¶¶ 16-18 (JA0025-0028).[9] Because the proposed modification "will not present significant interference problems," the Commission decided that it would "continue to consider" SpaceX's system, "as modified, part of the 2016/2017 Processing Rounds." *Id.* ¶ 18 (JA0028).

2. Environmental Issues

The Commission also addressed requests by Viasat and the Balance Group to conduct an environmental analysis under NEPA before acting on the application. *Id.* ¶ 74 (JA0055). The Commission noted that "it is not clear that all of the issues raised by these parties are within the scope of NEPA or related to [the Commission's] action in approving SpaceX's Third Modification application," and that the petitions raised "novel questions about the scope of NEPA." *Id.* ¶ 77

[9] This issue "is relevant to SpaceX's status vis-à-vis other [non-geostationary fixed-satellite] systems in the same frequency bands." *Id.* ¶ 17 (JA0026). Under the FCC's processing round procedures, a non-geostationary system licensed in a later processing round "is required to coordinate to prevent harmful interference" to non-geostationary systems authorized in previous processing rounds. *Ibid.* (JA0027).

(JA0056). It explained that SpaceX had argued that NEPA, which applies to the "human environment," does not apply in space. *Id.* n.306 (JA0056). But "out of an abundance of caution," the Commission assumed that "NEPA may apply" and "consider[ed] the concerns raised in the record before [it]." *Id.* ¶ 77 (JA0056).

Because the modification was subject to a categorical exclusion under the Commission's NEPA rules, the Commission considered whether the appellants had demonstrated "reasons justifying or circumstances necessitating environmental consideration," and "whether the action may have a significant environmental impact and require preparation of an [environmental assessment]." *Id.* ¶ 75 (JA0055) (quoting 47 C.F.R. § 1.1307(c)). Viasat argued that in so doing, the Commission should consider the effects of "every satellite" covered by a past or pending SpaceX application. *Id.* ¶ 78 (JA0056). The Commission rejected this argument, explaining that "consistent with section 1.1307(c)," it would consider the potential effects of the "particular action" at issue—the proposed authorization of the satellites

covered by the "instant modification request." *Ibid.* (citing 47 C.F.R. § 1.1307(c)).[10]

Reentry Emissions. The Commission rejected Viasat's request to "conduct further research on the effects of alumina," the name commonly given to aluminum oxide, "along with other complex chemical compounds possibly emitted into the atmosphere upon satellite reentry." *Id.* ¶ 80 (JA0058). The Commission noted that SpaceX had submitted evidence disputing Viasat's assertions of significant potential effects. *Id.* ¶ 80 & nn. 327-328 (JA0058). SpaceX's submissions included evidence that Viasat's allegations were incorrect by an "order of magnitude," and that even under a "totally unrealistic worst-case scenario," where all of SpaceX's satellites re-entered the atmosphere at once, "SpaceX would still create about 0.5% the amount of alumina as the metals generated by meteorites entering the Earth's atmosphere in a given year." SpaceX April 2 Ex Parte at 5 (JA1277) (cited at *Order* ¶ 80 (JA0058)). The Commission found the record "insufficient" "for [it] to determine that . . . granting the SpaceX modification application may

[10] Viasat and the Balance Group do not challenge this conclusion. *See* Viasat Br. at 2 (challenging authorization to deploy 2,824 satellites plus replacements).

have a significant environmental impact on the atmosphere or ozone layer." *Id.* ¶ 82 (JA0059).

Reentry Casualty Risk. The Commission also rejected Viasat's call to reassess the risk that some satellites may incompletely "burn up on reentry and could reach the Earth's surface." *Id.* ¶ 84 (JA0060). It explained that the Bureau had "previously assessed the casualty risk associated with the SpaceX satellites and there is no material difference between those satellites and the ones under consideration here." *Id.* ¶ 85 (JA0060). The Commission concluded that the record supported SpaceX's assertion that its satellites "are designed to demise upon reentry into Earth's atmosphere," presenting a casualty risk of "roughly zero," and that the record therefore did "not provide a justification for further environmental review of this issue." *Id.* ¶¶ 84, 85 (JA0060).

Launch Emissions. The Commission rejected Viasat's request to analyze emissions from SpaceX launches because "the [Federal Aviation Administration] has prepared its own [environmental assessment] on the SpaceX launches." *Id.* ¶ 82 (JA0059). The assessment concluded with a finding of no significant impact. *Id.* ¶ 81 (JA0058). The Commission explained that because the Federal

Aviation Administration had "assumed responsibility" for the environmental effects of launches, "no additional consideration of potential impacts associated with those launches is required" under the Commission's rules. *Id.* ¶ 82 & n.331 (JA0059) (citing 47 C.F.R. § 1.1311(e)).

Astronomy and the Night Sky. The Commission next addressed concerns that the "number of satellites in [SpaceX's] constellation, coupled with their operating altitude, will cause those satellites to have a serious impact on astronomy and stargazing." *Id.* ¶ 86 (JA0060). It explained that modifying SpaceX's license to allow a lower orbital altitude would "significantly reduce the amount of time those satellites reflect sunlight during the night, thereby lessening their impact on astronomy"—a conclusion supported by the American Astronomical Society. *Id.* ¶ 86 (JA0060). The Commission also noted that SpaceX had been "working in close collaboration with the astronomy community" to develop technologies to reduce the visibility and impact of SpaceX satellites. *Ibid.* It stated that it would monitor those activities to ensure SpaceX "continue[s] its efforts to fulfill its commitments to the astronomy community." *Id.* ¶ 87 (JA0062). In light

of the "robust record" on this issue and SpaceX's ongoing mitigation efforts, the Commission concluded that "the issues raised do not justify the need for an [environmental assessment]." *Ibid.*

Orbital Debris. The Commission rejected Viasat's request for additional review of the potential for SpaceX's satellites to cause collisions and increase orbital debris. *Id.* ¶ 89 (JA0063). The Commission explained that it reviewed these issues as part of SpaceX's orbital debris mitigation plan, and concluded that plan was "consistent with the public interest." *Ibid.* The Commission therefore found no "reasons justifying or circumstances necessitating" further consideration under NEPA. *Ibid.* (citing 47 C.F.R. § 1.1307(c)).

Radiofrequency Emissions. The Balance Group argued that SpaceX's application is "missing information on peer-reviewed studies assessing radiofrequency exposure caused by the SpaceX constellation." *Id.* ¶ 90 (JA0064). The Commission explained that its rules require an environmental assessment of radiofrequency emissions only if the proposed action would "cause human exposure to levels of radiofrequency radiation in excess of the limits in the Commission's radiofrequency rules." *Id.* ¶ 91 (JA0064). Because SpaceX "confirm[ed]

its compliance with our radiofrequency exposure rules," the Commission concluded that "no additional environmental consideration of radiofrequency exposure issues is required." *Ibid.* (JA0064).

None of the appellants filed a motion to reconsider any aspect of the *Order*.[11] On June 2, 2021, Viasat filed a motion in this Court to stay the *Order*. The Court denied the motion on July 20, 2021.

STANDARD OF REVIEW

Under the Administrative Procedure Act, the Court must uphold an agency's decision unless it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). Under this "deferential" standard, "[a] court simply ensures that the agency has acted within a zone of reasonableness and, in particular, has reasonably considered the relevant issues and reasonably explained the decision." *FCC v. Prometheus Radio Project*, 141 S. Ct. 1150, 1158 (2021). The Court "is not to ask whether [the challenged] regulatory decision is the best one possible or even whether it is better than the alternatives." *FERC v. Elec. Power Supply Ass'n*,

[11] Two motions for reconsideration were filed by other parties addressing interference issues, which remain pending.

577 U.S. 260, 292 (2016). "The Commission need only articulate a 'rational connection between the facts found and the choice made.'" *Rural Cellular Ass'n v. FCC*, 588 F.3d 1095, 1105 (D.C. Cir. 2009) (quoting *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Ins. Co.*, 463 U.S. 29, 43 (1983)).

This Court reviews an agency's compliance with NEPA under the Administrative Procedure Act's "deferential standard of review." *Mayo v. Reynolds*, 875 F.3d 11, 19 (D.C. Cir. 2017). In so doing, the Court's role is "limited," and is not to "flyspeck an agency's environmental analysis, looking for any deficiency no matter how minor." *Sierra Club v. FERC*, 867 F.3d 1357, 1367-68 (D.C. Cir. 2017). The review recognizes that "inherent in NEPA and its implementing regulations is a rule of reason," which requires the Court to take into account "the usefulness of any new potential information to the decisionmaking process." *Mayo*, 875 F.3d at 20. This "deferential rule of reason" applies to the decision "not to prepare a NEPA analysis," *id.*, and to "the extent to which [the agency] must discuss" its analysis, *WildEarth Guardians v. Jewell*, 738 F.3d 298, 310 (D.C. Cir. 2013).

SUMMARY OF THE ARGUMENT

The Commission reasonably granted SpaceX's request to modify the orbital altitude of 2,824 of its Starlink satellites, which the Commission concluded would serve the public interest by improving broadband access in underserved areas and reducing the potential to generate orbital debris. Neither DISH's arguments regarding the potential for interference nor the criticisms by Viasat and the Balance Group of the Commission's review of environmental issues have merit.

I. The Commission's determination that SpaceX's satellites will not cause unacceptable interference to other operators was reasonable. SpaceX certified that it satisfies limits set by the ITU, which is the standard the Commission uses to assess potential for interference. *See* 47 C.F.R. § 25.289. DISH's argument that the Commission should have evaluated SpaceX's application based on studies that did *not* use ITU-approved software, or that the Commission should have conducted its own assessment of SpaceX's compliance, would have the Commission ignore its own rules. And although DISH asserts that as a practical matter SpaceX cannot meet the ITU standard, the Commission reasonably relied on SpaceX's certification that it would satisfy that

standard, and imposed enforceable operational requirements on SpaceX designed to address DISH's concerns.

The Commission reasonably granted SpaceX's request to retain a previously granted waiver of compliance with the requirement that SpaceX receive a "favorable" or "qualified favorable" finding from the ITU prior to initiation of service. The Commission's rules allow the Commission to waive any rule for "good cause shown." 47 C.F.R. § 1.3. Here, the ITU was not expected to review SpaceX's modification for some time, and immediate deployment of SpaceX's system would serve the public interest by expanding access to broadband in underserved regions. And under the *Order*, SpaceX must adjust its operation to any concerns that the ITU later expresses.

Because the Commission determined that SpaceX will not present significant interference problems, it reasonably declined to treat SpaceX's modification application as a newly-filed application for purposes of applying its "processing round" procedures. DISH lacks standing to challenge that decision because it was not injured by the decision. In any event, the Commission's straightforward application of its precedent is reasonable, and DISH's argument that the Commission

failed to consider interference with geostationary systems misunderstands the *Order*, which did consider interference with such systems.

II. DISH's claim that the Commission improperly subdelegated its authority to the ITU and SpaceX is not properly before the Court because it was never raised with the Commission. In any event, the claim is baseless. The FCC did not subdelegate its decision-making authority to the ITU. The requirement that licensees obtain a "favorable" finding from the ITU is a reasonable condition for granting FCC approval; and the ITU simply provides factual information on which the Commission may properly rely. Nor did the Commission subdelegate its authority by relying on SpaceX's certification of compliance with the ITU standard. The Commission regularly and properly relies on representations by regulated entities.

III. DISH's remaining due process and judicial review arguments are procedurally barred and in all events, without merit: DISH's asserted interest is not a protected property right, and it is obtaining judicial review through this appeal.

IV. The environmental challenges mounted by Viasat and the Balance Group likewise fail. At the outset, Viasat and the Balance Group lack standing because neither has asserted an injury that satisfies the requirements of Article III and is within NEPA's zone of interests. Viasat alleges increased costs and competition, injuries that do not satisfy Article III because Viasat has not substantiated that its claimed costs are caused by SpaceX, and which are outside NEPA's zone of interests because they are not tied to any environmental concerns. To the extent that Viasat has an interest in avoiding collisions with its own satellites, it has not shown that the SpaceX satellites at issue present a demonstrably increased risk to those satellites. And the Balance Group has not established that it has any members on whose behalf it brings this appeal for purposes of associational standing, nor that any of its activities have been perceptibly impaired by the *Order* for purposes of organizational standing.

V. Viasat and the Balance Group's environmental challenges also fail on the merits. Because space station authorizations fall within the Commission's categorical exclusion, further review is required only where the Commission concludes that their potential effects on the

environment may be significant. The Commission reasonably concluded that this standard was not met.

First, the Commission reasonably concluded that the record did not show that effects from the deposit of alumina and other particulates as a result of the re-entry of the SpaceX satellites authorized by the *Order* might be "significant." Contrary to Viasat and the Balance Group's contention, an environmental assessment is not required simply because there may be some potential for environmental impact, no matter its size.

Second, the Commission previously assessed the risk of SpaceX debris falling to Earth as part of the review of SpaceX's orbital debris plan, and it was not required to re-assess the same issue in addressing Viasat and the Balance Group's environmental claims. Their attacks on the Bureau's previous assessment of the facts are without merit and do not undermine the Commission's conclusion that the record did not show a significant potential risk of debris reaching Earth upon re-entry.

Third, the Commission reasonably declined to review the environmental effects of emissions resulting from satellite launches because the Federal Aviation Administration—the agency that licenses

such launches—had already conducted an environmental assessment of SpaceX launches. Viasat and the Balance Group assert that the Federal Aviation Administration's review was deficient, but the Commission reasonably relied, under its rules, on the analysis conducted by the agency with primary federal regulatory authority over launch operations.

Fourth, the Commission reasonably concluded that no further review of SpaceX's effects on astronomy and the night sky was necessary. The record showed that SpaceX had engaged in efforts to mitigate those effects and was working with the astronomy community to make additional progress. The studies on which Viasat and the Balance Group rely discuss effects on the night sky from a host of sources; they do not undermine the Commission's conclusion that the record did not show that the SpaceX satellites at issue may have significant effects.

Fifth, the Commission reasonably concluded that it need not re-assess the risk that SpaceX satellites will generate debris in orbit, a risk it examined in detail in its review of SpaceX's debris mitigation

plan. The Commission explained that its analysis was necessarily based on estimates of risk, and no further detail was required.

ARGUMENT

I. THE COMMISSION PROPERLY APPLIED ITS RULES IN ASSESSING WHETHER SPACEX COULD PROVIDE ITS NEW SERVICE WITHOUT CAUSING HARMFUL INTERFERENCE TO DBS SERVICES

The operator of a non-geostationary satellite system "must not cause unacceptable interference to" geostationary satellite services such as DBS. 47 C.F.R. § 25.289. Under the FCC's rules, a non-geostationary satellite system operator "will be considered as having fulfilled [its] obligation" not to cause harmful interference to DBS services if it "operat[es] in compliance with the applicable equivalent power flux density limits in Article 22, Section II of the ITU Radio Regulations." *Ibid.* To demonstrate compliance with these limits, the operator must follow a two-step procedure prescribed by section 25.146 of the FCC's rules, 47 C.F.R. § 25.146. First, when applying to the FCC for a license, the operator must certify that it will comply with the ITU's power limits. *Id.* § 25.146(a)(2). Second, after obtaining a license, the operator "must receive a 'favorable' or 'qualified favorable' finding by the ITU Radiocommunication Bureau" confirming the operator's compliance. *Id.* § 25.146(c).

When it adopted this regulatory framework in 2017, the Commission made clear that the ITU—not the FCC or its staff—would make findings regarding an operator's compliance with the ITU's power limits. The Commission explained that since it was "adopting the [equivalent power flux density] limits contained in Article 22 of the ITU Radio Regulations, and applicants must use the ITU-approved validation software to assess compliance with these limits," any review by the Commission's staff "would duplicate that performed by the ITU Radiocommunication Bureau," needlessly adding "a few months" to the review process. *2017 Order*, 32 FCC Rcd. at 7822 ¶ 41. "Given the newly available ITU validation software and the separate analysis conducted by the ITU," the Commission reasonably concluded that additional review by its own staff was unnecessary. *Ibid.* Once an operator obtains a "favorable" or "qualified favorable" finding from the ITU, it need only notify the FCC of the ITU's finding and provide the Commission with the input data files used for the ITU validation software. 47 C.F.R. § 25.146(c)(1)-(2).

The FCC properly applied section 25.146 of its rules when evaluating SpaceX's proposed service. The Commission was "satisfied

with SpaceX's certification that it will not violate ITU [equivalent power flux density] limits relevant to the 12.2-12.7 GHz band" (the spectrum used by DBS services). *Order* ¶ 39 (JA0039). SpaceX supported its certification with a detailed analysis using "approved ITU software and methodologies." *Id.* ¶ 36 (JA0038).

Having determined that SpaceX's service complies with the ITU's power limits, the Commission satisfied its obligation under the Communications Act to prevent harmful interference and consider the public interest when evaluating SpaceX's application. DISH's claim to the contrary (Br. 47-49) is unfounded.

Pursuant to 47 C.F.R. § 25.146(c), SpaceX must now verify its compliance with the ITU's limits by obtaining a "favorable" or "qualified favorable" finding from the ITU Radiocommunication Bureau. Although a partial waiver of section 25.146(c) by Commission staff allowed SpaceX to initiate service in October 2020 (before the completion of ITU review), SpaceX's decision to launch its service before receiving a finding from the ITU is "at SpaceX's own risk." *First Modification Order*, 34 FCC Rcd. at 2536 ¶ 28. In the event of "an

unfavorable finding" by the ITU, SpaceX will have to "adjust its operations to satisfy the ITU requirements." *Order* ¶ 34 (JA0037).

A. Analysis Of SpaceX's Proposed Service Using The ITU's Software Shows That The Service Will Not Cause Harmful Interference

DISH does not dispute that if SpaceX complies with the ITU's equivalent power flux density limits, its service will not cause harmful interference to DBS services. DISH also does not dispute that if the ITU's validation software is used to analyze the service SpaceX proposes to offer (with operations confined to one satellite beam in an area at a time), SpaceX complies with the ITU's power limits. Indeed, DISH's first interference study, which used the ITU software, reached that very conclusion.[12]

DISH contends, however, that if SpaceX transmits more than one beam in an area at a time, its service will exceed the ITU's power limits. DISH Br. 16. But SpaceX has consistently maintained that "the way

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[12] *See* DISH Br. 16-17 (citing First DISH Study at 22 (JA0141)). In the table reporting the results of DISH's first interference study, the "Baseline" column lists the results when testing SpaceX's service at an Nco value of one (*i.e.*, with operations restricted to one beam in an area at a time). Under those conditions, the study found that SpaceX's service complies with the ITU's power limits under every scenario examined by the ITU software.

[it] in fact has operated its system and the method by which it will continue to operate its system in the future" is to transmit no more than one beam in an area at a time. *Order* ¶ 37 (JA0038). To remove any doubt, SpaceX "agreed to [a] condition proposed by DISH" that SpaceX must operate at "an Nco value of one"—*i.e.*, "SpaceX [may] not use more than one satellite beam from any of its satellites in the same frequency in the same or overlapping areas at a time." *Id.* ¶ 39 (JA0039).

DISH nonetheless speculates that SpaceX may have to violate this condition so that it can "meet its service-level obligations in connection with its Rural Digital Opportunity Fund subsidies."[13] DISH Br. 33; *see Order* ¶ 38 (JA0039). But as a condition of its grant of SpaceX's request for modification, the Commission required that "Space X not use more than one satellite beam from any of its satellites in the same frequency in the same or overlapping areas at a time." *Order* ¶ 97e (JA0066). If SpaceX were to violate this condition, it could face substantial

[13] As a recipient of such subsidies, SpaceX must meet certain service milestones and deployment obligations. *See Rural Digital Opportunity Fund*, 35 FCC Rcd. 686, 709-12 ¶¶ 45-55 (2020); 47 C.F.R. § 54.802(c).

penalties, including monetary forfeitures, *see* 47 U.S.C. § 503(b)(1), and even revocation of its license, *see id.* § 312(a).

B. The Commission Rightly Refused To Conduct A Compliance Review That Was Inconsistent With FCC Rules And The ITU's Methodology For Determining Compliance With The Radio Regulations

DISH contends that even if SpaceX's operations are limited to one satellite beam in an area at a time, SpaceX's service will exceed the ITU's equivalent power flux density limits. DISH bases this claim on the second and third interference studies it placed in the record. It argues that the FCC arbitrarily declined to consider those studies. DISH Br. 33-38. But those studies did *not* use the ITU's software. Therefore, the FCC properly treated them as irrelevant. If the Commission had relied on those studies as a basis for denying SpaceX's modification application, the agency would have violated its own rules.

Section 25.146 of the FCC's rules "incorporates findings by the ITU Radiocommunication Bureau regarding compliance with ITU [equivalent power flux density] limits." *Order* ¶ 40 (JA0040). In adopting this rule, the Commission concluded that "it could rely on ITU Radiocommunication Bureau review as a technical matter, including requiring applicants to use the ITU-approved software to assess

compliance with [equivalent power flux density] limits." *Ibid*. The ITU Radiocommunication Bureau uses the software to determine whether a system complies with the limits. *See* ITU Circular CR/414, Dec. 6, 2016 (JA0249-0251) (available at https://www.itu.int/dms_pub/itu-r/md/00/cr/cir/R00-CR-CIR-0414!!PDF-E.pdf).[14]

Section 25.146 establishes a straightforward two-step process for establishing compliance with the ITU's power limits: (1) a satellite operator certifies its compliance, *see* 47 C.F.R. § 25.146(a)(2); and (2) the operator subsequently confirms its compliance by obtaining a "favorable" or "qualified favorable" finding from the ITU Radiocommunication Bureau, *see id*. § 25.146(c). The Commission made clear that this process would *not* include any separate compliance review by the FCC or its staff. *See 2017 Order*, 32 FCC Rcd. at 7822 ¶ 41.

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[14] The FCC also uses the ITU software to determine when coordination between non-geostationary and geostationary systems is required. Coordination is required if, *inter alia*, the equivalent power flux density radiated by a non-geostationary system into a geostationary receive earth station exceeds a certain level "as calculated using the ITU software." 47 C.F.R. § 25.146(d)(2).

DISH argues that in this proceeding, the FCC should have refused to follow the procedures established by section 25.146. According to DISH, the Commission should have conducted its own independent analysis of SpaceX's compliance with the ITU's power limits. DISH further asserts that its second and third interference studies warranted a finding by the FCC that SpaceX exceeds those limits. But "the methodology" used by those studies to evaluate SpaceX's compliance with the ITU's power limits was "not ITU-approved." *Order* ¶ 38 (JA0039). "[T]he relevant [interference] analysis under the Commission's rules is analysis using ITU-approved software." *Id.* ¶ 40 (JA0040). DISH acknowledges that its second and third studies did not use the ITU's validation software. *See id.* n.178 (JA0039); DISH Br. 17-19. The Commission therefore reasonably declined to consider those studies because any review of SpaceX's compliance based on those studies would have been inconsistent with FCC rules.

As this Court has long recognized, "it is elementary that an agency must adhere to its own rules and regulations." *AT&T Corp. v. FCC*, 448 F.3d 426, 434 (D.C. Cir. 2006) (quoting *Reuters Ltd. v. FCC*, 781 F.2d 946, 950 (D.C. Cir. 1986)). Rather than depart from its

established rules and procedures in this proceeding to consider interference studies that did not use ITU-approved software, the FCC properly accepted SpaceX's certification of compliance with the ITU's equivalent power flux density limits. Consistent with FCC rules, SpaceX based its certification on a technical analysis that (unlike DISH's second and third studies) "used approved ITU software and methodologies" to demonstrate compliance. *Order* ¶ 36 (JA0038).

In refusing to conduct an independent compliance review based on DISH's second and third interference studies, the Commission properly recognized that it "is bound by its own regulations." *Erie Boulevard Hydropower, LP v. FERC*, 878 F.3d 258, 269 (D.C. Cir. 2017). If (contrary to its rules) the Commission had rejected SpaceX's certification based on interference studies that did not use an ITU-approved methodology, SpaceX would have a strong case that the agency's action was unlawful. "The Commission abuses its discretion when it arbitrarily violates its own rules, not when it follows them." *BDPCS, Inc. v. FCC*, 351 F.3d 1177, 1184 (D.C. Cir. 2003). Here, the Commission properly followed its rules.

C. The Commission's Partial Waiver Of Section 25.146(c) Was Reasonable

Section 25.146(c) requires a licensed operator of a non-geostationary fixed-satellite system to receive a "favorable" or "qualified favorable" finding from the ITU "[p]rior to the initiation of service." 47 C.F.R. § 25.146(c). In 2019, the Bureau granted SpaceX's request for a partial waiver of this rule to allow SpaceX to begin providing service before the ITU issues such a finding. The Bureau, however, still required SpaceX to receive a "favorable" or "qualified favorable" finding from the ITU. And if SpaceX began providing service before the ITU made a finding, SpaceX would have to "adjust its operation to satisfy the ITU requirements" in the event the ITU later made an unfavorable finding. *First Modification Order*, 34 FCC Rcd. at 2536 ¶ 28.

No party asked the Commission to review the Bureau's ruling, and SpaceX began offering service as part of a beta test of its Starlink service in October 2020.[15]

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[15] *See* Kate Duffy, *SpaceX's Starlink: Everything you need to know about Elon Musk's internet service,* March 21, 2021, available at https://www.businessinsider.com/spacex-starlink-internet-service-elon-musk-all-you-need-know-2021-2.

After SpaceX applied for a third modification of its license, AT&T argued that the Commission "should not permit SpaceX to commence operations under [the] proposed third modification until it has obtained the 'favorable' or 'qualified favorable' finding from the ITU." *Order* ¶ 35 (JA0037). The Commission, however, found "no reason to revoke" the Bureau's "previously-granted waiver of section 25.146(c)." *Id.* ¶ 41 (JA0040).

DISH now contends (Br. 38-43) that the partial waiver was improper. That claim fails.

Generally, the FCC may waive any of its rules "for good cause shown." 47 C.F.R. § 1.3; *see First Modification Order*, 34 FCC Rcd. at 2527 ¶ 5. Under this standard, waiver is "appropriate when particular facts would make strict compliance inconsistent with the public interest." *AT&T Wireless Servs., Inc. v. FCC*, 270 F.3d 959, 965 (D.C. Cir. 2001) (internal quotation marks omitted). The Commission thus may waive a rule "if special circumstances warrant a deviation from the general rule and such deviation will serve the public interest." *Ne. Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

Applying that standard, the Bureau reasonably found that the partial waiver of section 25.146(c) requested by SpaceX would serve the public interest. As the Bureau explained, "the ITU will not examine" SpaceX's modified service proposal "anytime soon." *First Modification Order*, 34 FCC Rcd. at 2536 ¶ 28. Therefore, strict compliance with section 25.146(c) would significantly delay the introduction of SpaceX's service. The Bureau understood that the public interest would best be served if SpaceX adhered to "its expedited deployment schedule." *Ibid.* SpaceX planned to make "broadband services available … in areas previously underserved or even totally unserved by other broadband solutions." *Id.* at 2526 ¶ 1. The Bureau saw no good reason to delay the offering of this service to consumers living in areas with little or no access to broadband. The Bureau accordingly waived the requirement that SpaceX obtain a favorable finding from the ITU before initiating its service.

The same public interest considerations underlying the Bureau's grant of the waiver justified the Commission's conclusion that there was "no reason to revoke" the waiver when SpaceX requested a third modification of its license. *Order* ¶ 41 (JA0040). The Commission

found that this modification would "improve [broadband] service to remote and underserved areas, including polar regions." *Id.* ¶ 13 (JA0024). The record reflected that "a number of the satellites being deployed pursuant to this modification" would be "uniquely able to provide improved service to higher latitude [*i.e.*, polar] regions." *Id.* ¶ 12 (JA0024). In the Commission's reasonable judgment, the rapid deployment of SpaceX's service to "often-underserved polar regions," *ibid.*—including remote Alaskan communities with a "scarcity of reliable internet service," *id.* ¶ 9 (JA0023)—will advance the public interest. The partial waiver of section 25.146(c) helps ensure that these underserved areas will gain access to SpaceX's service without undue delay. In the absence of evidence that the waiver was no longer in the public interest, it would "flip[] reasoned decisionmaking on its head," in DISH's phrase (at 40), to treat the FCC's rejection of AT&T's request to revoke this previously granted waiver, on which SpaceX has relied, as a de novo grant.

DISH asserts that the waiver was improper because the FCC did not grant similar waivers to "other non-geostationary satellite operators." DISH Br. 41-42. DISH cites only one instance of such

"differential" treatment: The Commission required OneWeb to obtain a favorable finding from the ITU prior to initiation of service. DISH Br. 41-42; *see WorldVu Satellites Ltd.*, 32 FCC Rcd. 5366, 5375 ¶ 19 (2017). But OneWeb never requested a waiver of that requirement. Instead, it sought—and received—a waiver of the requirement that OneWeb provide the "source code" for the software it used to certify compliance with the ITU's power limits. That requirement was part of an earlier version of section 25.146. *See* 47 C.F.R. § 25.146(a)(1)(iii) (2017).

The "source code" requirement applied at a time when "software approved by the ITU" was "not available." *WorldVu*, 32 FCC Rcd. at 5375 ¶ 19. Because the ITU had not yet approved the final version of its validation software, "OneWeb utilized a beta version" of the software "in development with the ITU" to certify its compliance with the ITU's power limits. *Ibid.* When the ITU "subsequently approved" a "final version" of the software, the FCC decided to obtain "additional assurances" of OneWeb's compliance by requiring OneWeb to obtain a favorable finding from the ITU "prior to initiation of service." *Ibid.* The Commission reasonably took a different approach here because SpaceX (unlike OneWeb) used the approved final version of the ITU software to

demonstrate its compliance—the same software that the ITU will employ to evaluate SpaceX's compliance.[16]

DISH argues that as a result of the waiver, SpaceX's service could cause harmful interference to DBS operations before the ITU makes a finding regarding the service. DISH Br. 43. This prospect is unlikely for two reasons.

First, SpaceX based its certification of compliance on "[equivalent power flux density] calculations using the ITU software." *First Modification Order*, 34 FCC Rcd. at 2536 ¶ 28; *see also Order* ¶ 36 (JA0038) (SpaceX "used approved ITU software and methodologies" to certify compliance). The ITU will use the same software to assess SpaceX's compliance with the ITU's power limits. DISH's first interference study indicated that if the ITU software is applied to the

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[16] Under ITU Resolution 85 (WRC-03) (JA0247-0248), the evaluation process predating the ITU software will be applied in "cases where the software cannot adequately model certain non-geostationary satellite … systems" until the software can be updated to improve the modeling of such systems. ITU Circular CR/414 at 2 (JA0250). That exception does not apply here. The FCC has not asked the ITU for Resolution 85 treatment of SpaceX's system; and the input files submitted to the ITU by SpaceX are designed to be used with the ITU software. Accordingly, the ITU will use its software to evaluate SpaceX's system.

service that SpaceX proposes to offer, SpaceX will be found to comply with the limits. *See* First DISH Study at 22 (JA0141). And the Commission has determined that a non-geostationary system that complies with the ITU's power limits will not cause harmful interference to geostationary networks such as DBS systems. *See* 47 C.F.R. § 25.289.

Second, SpaceX knows that if it receives "an unfavorable finding" from the ITU, it will have to "adjust its operation to satisfy the ITU requirements." *Order* ¶ 34 (JA0037). Consequently, "SpaceX has every incentive to ensure" that its service complies with the ITU's limits even before the ITU makes a finding regarding compliance. *Ibid.*

D. The Commission Reasonably Declined To Treat SpaceX's Third Modification Application As Part Of The 2020 Processing Round

The Commission and its staff treat an application for modification of a non-geostationary system "as a newly filed application" and consider the application "in a subsequent satellite processing round" if the modification would "present significant interference problems." *Teledesic LLC*, 14 FCC Rcd. at 2264 ¶ 5; *see Order* ¶ 16 (JA0026).

SpaceX's system was originally authorized during the 2016 and 2017 processing rounds. *See Order* ¶ 15 (JA0025). When SpaceX applied for a third modification of its system, several parties (including DISH) argued that the FCC should consider SpaceX's application as part of the 2020 processing round because (in their view) the proposed modification was "a complete redesign of SpaceX's authorized system" and would "substantially increase interference into other systems." *Ibid*.

The Commission reasonably rejected that argument. It said that it would "continue to consider" SpaceX's modified system "part of the 2016/2017 Processing Rounds" because it found that the proposed modification would "not present significant interference problems." *Order* ¶ 18 (JA0028). DISH challenges that decision on appeal. DISH Br. 43-46. But DISH fails to explain how it is harmed by the decision, which concerns only "SpaceX's status vis-à-vis other [non-geostationary satellite] systems in the same frequency bands." *Order* ¶ 17 (JA0026). The FCC's application of its processing round procedures does not affect DISH's rights as a geostationary satellite system operator. Nor has DISH explained how the processing round decision would increase the

risk of harmful interference to DISH (the alleged injury on which DISH bases its claim of Article III standing). *See* DISH Br. 29. Because DISH "alleges no particularized injury" stemming from the FCC's processing round decision, it lacks standing to challenge that decision. *See KERM, Inc. v. FCC*, 353 F.3d 57, 58 (D.C. Cir. 2004).

In any event, DISH's challenge to the FCC's application of its processing round procedures lacks merit. In applying those procedures to SpaceX, the Commission employed "the same standard" for determining the potential for interference that the International Bureau used in *Teledesic*. *Order* ¶ 16 (JA0026) (citing *Teledesic*, 14 FCC Rcd. at 2264 ¶ 5). DISH asserts that the Commission deviated from the *Teledesic* standard by considering "*only* interference to other non-geostationary systems." DISH Br. 45. Not so. The Commission analyzed the effect of the proposed modification "on *both* geostationary and non-geostationary systems." *See ibid.* (citing *Teledesic*, 14 FCC Rcd. at 2270 ¶ 20); *see Order* ¶¶ 32-47 (JA0035-0043). It found that "the modification will not create any significant interference problems to other [non-geostationary] systems," *Order* ¶ 21 (JA0030); *see id.* ¶¶ 19-31 (JA0028-0035), and "will not increase interference into

[geostationary] satellite systems," *id.* ¶ 47 (JA0043); *see id.* ¶¶ 32-47 (JA0035-0043). Given these findings, the Commission rightly refused to treat SpaceX's modification application as part of the 2020 processing round.

II. THE COMMISSION DID NOT IMPROPERLY SUBDELEGATE ITS DECISION-MAKING AUTHORITY

DISH maintains that the Commission in this proceeding unlawfully subdelegated its decision-making authority to the ITU and SpaceX. DISH Br. 49-58. This argument "has been forfeited" because it "was never raised with the Commission." *Nat'l Lifeline Ass'n v. FCC*, 983 F.3d 498, 509 (D.C. Cir. 2020); *see* 47 U.S.C. § 405(a). The Court "lack[s] jurisdiction to review arguments that have not first been presented to the Commission." *BDPCS*, 351 F.3d at 1182.

In any event, even if DISH's subdelegation claim were preserved for appeal, it is unavailing. The FCC did not subdelegate its decision-making authority to either the ITU or SpaceX.

A. The FCC Did Not Subdelegate Its Decision-Making Authority To The ITU

The FCC's rules—which were adopted through notice and comment rulemaking, and which were not appealed, *2017 Order*, 32 FCC Rcd. at 7820, 7822 ¶¶ 35, 42—require that a licensed provider of

non-geostationary fixed-satellite service receive a "favorable" or "qualified favorable" finding from the ITU. 47 C.F.R. § 25.146(c). That requirement does not impermissibly subdelegate decision-making authority to the ITU, as DISH claims (Br. 51-56). Rather, the requirement is "a reasonable condition for granting federal approval" to operate a satellite system. *United States Telecom Ass'n v. FCC*, 359 F.3d 554, 566 (D.C. Cir. 2004).

As this Court has recognized, "a federal agency entrusted with broad discretion to permit or forbid certain activities may condition its grant of permission on the decision of another entity, … so long as there is a reasonable connection between the outside entity's decision and the federal agency's determination." *United States Telecom*, 359 F.3d at 567. Such a connection exists here. A "favorable" finding by the ITU provides verification that the operator of a non-geostationary satellite system complies with the ITU's equivalent power flux density limits. If the operator complies with those limits, it satisfies its "obligation" under the FCC's rules not to "cause unacceptable interference to" geostationary satellite networks. *See* 47 C.F.R. § 25.289. Consequently, a "favorable" finding by the ITU is clearly linked to the FCC's

determination that a licensee can provide non-geostationary fixed-satellite service without causing harmful interference.

There also was no improper subdelegation here because the FCC merely asked the ITU "to provide the agency with factual information"—*i.e.*, whether SpaceX complies with the ITU's power limits. *United States Telecom*, 359 F.3d at 567. The ITU's "nondiscretionary information gathering" is a "legitimate outside party input into [the Commission's] decision-making processes," not a subdelegation of the Commission's decision-making authority. *Id.* at 566-67.[17]

[17] DISH is simply wrong when it asserts (Br. 53) that ITU approval is "a floor, not a ceiling, on the Commission's independent obligation to prevent interference." Consistent with its duties, the FCC adopted a rule requiring non-geostationary satellite systems to comply with the ITU's equivalent power flux density limits to prevent interference between stations. Under that rule, a system that complies with those limits "will be considered as having fulfilled [its] obligation" not to "cause unacceptable interference to" geostationary networks. 47 C.F.R. § 25.289. Accordingly, if the ITU finds that a system complies with the ITU's power limits, the FCC will find (pursuant to section 25.289 of its rules) that the system will not cause harmful interference.

B. The FCC Did Not Subdelegate Its Decision-Making Authority To SpaceX

There is also no basis for DISH's assertion (Br. 56-58) that the FCC unlawfully subdelegated its authority to SpaceX by accepting SpaceX's certification of compliance. It is common—and entirely permissible—for the Commission to rely on certifications by regulated entities. "Certification is the mechanism the FCC employs for a broad range of its … functions." *Global Crossing Telecomms., Inc. v. FCC*, 259 F.3d 740, 745 (D.C. Cir. 2001).[18] Indeed, "the Commission has adopted certification requirements for other satellite power limits, even in the absence of any technical review." *2017 Order*, 32 FCC Rcd. at 7822 n.92; *see* 47 C.F.R. § 25.140(a)(3) (applicants for geostationary space station licenses (like those DISH operates) must certify that they comply with specified power limits).

This Court has held that the Commission may reasonably rely on a party's certification where (as here) "certification is merely the initial

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[18] *See, e.g., Cellular Phone Taskforce v. FCC*, 205 F.3d 82, 92-93 (2d Cir. 2000) (the Commission permissibly relied on applicants' "undocumented self-certification of compliance" with the FCC's limits on radiofrequency emissions); *CHM Broad. Ltd. P'ship v. FCC*, 24 F.3d 1453, 1455-56 (D.C. Cir. 1994) (applicants for radio station licenses demonstrate their financial qualifications via self-certification).

step" in the regulatory process. *Global Crossing*, 259 F.3d at 745. Although SpaceX has certified that it complies with the ITU's power limits, it is still required to obtain a "favorable" or "qualified favorable" finding from the ITU. If the ITU makes "an unfavorable finding" regarding SpaceX's service, SpaceX will have to "adjust its operations to satisfy the ITU requirements." *Order* ¶ 34 (JA0037). And if SpaceX has made a false certification, it could face "additional penalties, including fines and forfeitures, in an enforcement action brought by the Commission." *Global Crossing*, 259 F.3d at 745 (citing 47 U.S.C. §§ 501-504). In view of these post-certification procedures for verifying and enforcing compliance, there is no merit to DISH's claim that the Commission subdelegated its decision-making authority to SpaceX.

III. DISH'S CLAIMS CONCERNING JUDICIAL REVIEW AND DUE PROCESS ARE PROCEDURALLY BARRED; IN ANY EVENT, THEY LACK MERIT

Finally, DISH asserts that the *Order* "frustrates" DISH's "statutory right to judicial review" (Br. 58) and infringes "DISH's right to due process" (Br. 60). These claims are not properly before the Court because they were never raised before the Commission. *See* 47 U.S.C. § 405(a); *Nat'l Lifeline*, 983 F.3d at 509; *BDPCS*, 351 F.3d at 1182.

"[E]ven when a petitioner has no reason to raise an argument until the FCC issues an order that makes the issue relevant, the petitioner must file a petition for reconsideration with the Commission before it may seek judicial review." *Nat'l Lifeline*, 983 F.3d at 509 (quoting *Globalstar,* 564 F.3d at 484). DISH failed to satisfy this exhaustion requirement. Because the Commission received no "opportunity to pass" on DISH's judicial review and due process claims, 47 U.S.C. § 405(a), DISH is precluded from raising those issues on appeal. And even if those arguments had not been forfeited, they fail on the merits.

Judicial Review. DISH has no basis for claiming that the *Order* "frustrates" its "statutory right to judicial review of Commission orders." DISH Br. 59. It is undisputed that DISH can obtain judicial review of the *Order* under 47 U.S.C. § 402(b)(6).

DISH complains that it will be unable to obtain judicial review of any finding the ITU makes regarding SpaceX's service. DISH Br. 59-60. That is beside the point in this case, which involves the Commission's decision to waive the need for any such finding before SpaceX commences operations. Nothing in the *Order* impairs DISH's

right to judicial review of the Commission's decision, or any future Commission decision that relies on an ITU determination.

Due Process. DISH argues that the FCC violated its Fifth Amendment right to procedural due process. According to DISH, the Commission deprived it of an opportunity to be heard "before significantly limiting DISH's right to use its satellites by permitting interference into them." DISH Br. 61. This allegation cannot form the basis for a due process claim unless DISH has a constitutionally protected "property right" to use its satellites to provide FCC-licensed service. *See Cleveland Bd. of Educ. v. Loudermill*, 470 U.S. 532, 538 (1985). But the Communications Act is clear that FCC licenses "provide for the use" of spectrum, "but not the ownership thereof." 47 U.S.C. § 301.

Thus, the Supreme Court long ago ruled that an FCC licensee does not obtain "a property right as a result of the granting of a license." *FCC v. Sanders Bros. Radio Station*, 309 U.S. 470, 475 (1940). Likewise, this Court has held that the right to use spectrum under an FCC license "does not constitute a property interest protected by the Fifth Amendment." *Mobile Relay Assocs. v. FCC*, 457 F.3d 1, 12 (D.C.

Cir. 2006).[19] In short, DISH cannot assert a due process claim because its right to provide FCC-licensed DBS service is not a constitutionally protected property right.

In any event, even if property rights were implicated here, no due process violation occurred. The relevant decision is the Commission's *Order*, and DISH received an opportunity to be heard when it participated in the administrative proceeding that culminated in the *Order*. Moreover, contrary to DISH's assertion (Br. 60), the Commission did not impair "DISH's right to use its satellites by permitting interference into them." Rather, as we explained in Sections I.A and B above, the Commission reasonably determined that SpaceX's modified system would not cause harmful interference to DISH's DBS service.

IV. THE COMMISSION REASONABLY REJECTED VIASAT'S AND THE BALANCE GROUP'S ENVIRONMENTAL CHALLENGES

In addition to DISH's interference-based challenges, Viasat and the Balance Group contend that the FCC's modification of SpaceX's

[19] *See also Prometheus Radio Project v. FCC*, 373 F.3d 372, 428 (3d Cir. 2004) ("broadcast licenses . . . are not protected property interests under the Fifth Amendment").

license to permit some of its satellites to operate at a lower orbital altitude may have a significant environmental impact. At the outset, we show that neither has standing to raise these claims. In any event, the Commission reasonably determined that the record did not demonstrate that the modification may have significant effects that would require additional review in an environmental assessment.

A. Viasat and the Balance Group Lack Article III Standing And Are Outside NEPA's Zone Of Interests

In order to show standing to assert their claims, Viasat and the Balance Group must "demonstrate that they can satisfy all constitutional standing requirements and that their particularized injury is to interests of the sort protected by NEPA." *Fla. Audubon Soc. v. Bentsen*, 94 F.3d 658, 665 (D.C. Cir. 1996) (en banc).

To establish Article III standing, Viasat and the Balance Group "must make the requisite showing of injury, causation, and redressability." *Arapahoe Cty. Pub. Airport Auth. v. Fed. Aviation Admin.*, 850 F. App'x 9, 10 (D.C. Cir. 2021). Where a claim to standing is based on procedural injury, courts "relax—while not wholly eliminating—the issues of imminence and redressability." *Ctr. for Law & Educ. v. Dep't of Educ.*, 396 F.3d 1152, 1157 (D.C. Cir. 2005). The

burden is therefore to establish that it is "substantially probable that the substantive agency action that disregarded a procedural requirement created a demonstrable risk, or caused a demonstrable increase in an existing risk, of injury to the particularized interests of the plaintiff." *Sierra Club v. FERC*, 827 F.3d 59, 65 (D.C. Cir. 2016).

Viasat and the Balance Group must also show they are within NEPA's "zone of interests." *Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians v. Patchak*, 567 U.S. 209, 224 (2012). This test forecloses suit when a plaintiff's "interests are so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed that Congress intended to permit the suit." *Id.* at 225. It is "well-settled in this circuit that the injury that supplies constitutional standing must be the same as the injury within the requisite zone of interests for purposes of [statutory] standing." *Am. Inst. of Certified Pub. Accts. v. Internal Revenue Serv.*, 746 F. App'x 1, n.1 (D.C. Cir. 2018).

Neither Viasat nor the Balance Group satisfies these standards.

1. Viasat's Alleged Injuries Do Not Satisfy Article III and Are Outside NEPA's Zone of Interests

Viasat asserts three categories of injuries. None is sufficient under Article III and within NEPA's zone of interests.

First, Viasat claims it is harmed because the *Order* "forc[es] Viasat to compete with a rival that skirted legally required environmental review." Viasat Br. 22. But Viasat has "made no concrete showing" that the *Order* "is likely to cause [it] a financial injury." *PSSI Glob. Servs.,* 983 F.3d at 11-12. At best, it claims a "skewed playing field, which [this Court has] rejected as insufficient" to support Article III injury. *Id.*

In any event, Viasat's purely "economic interests" in reduced competition "simply do not fall within that zone" of environmental interests that NEPA protects. *Gunpowder Riverkeeper v. FERC*, 807 F.3d 267, 274 (D.C. Cir. 2015); *see also ANR Pipeline Co. v. FERC*, 205 F.3d 403, 408 (D.C. Cir. 2000) (NEPA does not protect interest in "suppressing competition"). Although economic harms can fall into NEPA's zone of interests where the "injury has an environmental as well as an economic component," *Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 155 (2010), there is no environmental component to

Viasat's assertion that SpaceX's operations will "compete with Viasat." Viasat Br. 21. The issue is therefore not that Viasat's "economic interests . . . blight [its] qualifying ones," as Viasat suggests, Viasat Br. 52, but rather, Viasat has "failed to demonstrate . . . any qualifying ones." *Nat'l Ass'n of Home Builders v. U.S. Army Corps of Eng'rs*, 417 F.3d 1272, 1288 (D.C. Cir. 2005).

Viasat contends that NEPA's "broad declarations of 'purpose' and 'policy'" bring Viasat's economic interests into NEPA's zone of interests. Viasat Br. 49-50 (citing 42 U.S.C. §§ 4321, 4331(a)). But a statute's zone of interests is not determined "by reference to the overall purpose of the Act in question" but by the "substantive provisions" at issue. *Grand Council of Crees (of Quebec) v. FERC*, 198 F.3d 950, 956 (D.C. Cir. 2000) (quoting *Bennett v. Spear*, 520 U.S. 154, 175-76 (1997)). In any event, Congress's interest in preserving "productive and enjoyable harmony between man and his environment," 42 U.S.C. § 4321, and fulfilling the needs of "future generations," 42 U.S.C. § 4331(a) (both cited at Viasat Br. 50), does not sweep competitive costs *without* an environmental component into the zone. *See Rosebud Sioux Tribe v. McDivitt*, 286 F.3d 1031, 1039 (8th Cir. 2002) (explaining that 42 U.S.C.

§ 4331(a) is "merely a broad policy statement, and d[oes] not provide a basis for . . . standing").

Viasat and the Balance Group contend that the *Order* "may have a significant environmental impact" requiring an environmental assessment despite the categorical exclusion applicable to space station operations. Viasat Br. 8 (citing 47 C.F.R. § 1.1307(c); *see also id.* at 7 (citing 40 C.F.R. §§ 1507.3(e)(2)(ii), 1501.4(b)). But nothing in the regulatory definition of "effects," 40 C.F.R. § 1508.1(g) (cited at Viasat Br. 50), suggests that an agency must consider potential competitive effects in deciding whether to require further review of a categorically excluded action. Rather, the regulations provide that "[e]conomic . . . effects by themselves do not require preparation of an environmental impact statement." 40 C.F.R. § 1502.16(b).

Second, Viasat claims it is injured because SpaceX's satellites will "creat[e] a more crowded orbital environment" and that it will "expend time and resources" avoiding collisions with SpaceX satellites. Viasat Br. 21. This vague assertion does not satisfy Article III. *See Nat'l Ass'n of Home Builders,* 417 F.3d at 1288-89 ("speculation" did not establish standing where record included "nothing concrete"); *Util. Workers*

Union of Am. Loc. 464 v. FERC, 896 F.3d 573, 578 (D.C. Cir. 2018) (rejecting "conclusory" claims of financial injury). Viasat has not identified any increased costs attributable to the SpaceX satellites that go beyond the general costs of operating in a space that is shared among satellite operators and already contains extensive debris. *See* JA0773-0774 (satellite operators already incur "protective and mitigation costs" to address potential for collisions with at least 20,000 existing satellites and pieces of tracked debris in low-Earth orbit, which are estimated to constitute 0.02% of debris larger than 1 millimeter in orbit). The Court cannot "presume the missing fact[]" that the SpaceX satellites at issue will (allegedly) impose *additional* costs on Viasat. *Swanson Grp. Mfg. LLC v. Jewell*, 790 F.3d 235, 240 (D.C. Cir. 2015); *see also id.* at 243 (allegations that failed to rule out "independent source" of costs held insufficient as to causation).

Even if sufficient to satisfy Article III, costs imposed by the presence of a competitor's equipment in the location where Viasat seeks to operate is an economic cost without an environmental component, and is similarly outside NEPA's zone of interests. *Monsanto*, 561 U.S. at 155.

Third, the remote possibility that Viasat may be harmed by "failed SpaceX satellites [or] debris from a collision involving a SpaceX satellite," Viasat Br. 20, is insufficient for Article III. Viasat's theory seems to be that *any* collision involving a SpaceX satellite—should it occur—will injure Viasat by increasing the risk of additional collisions that eventually "could damage, disable or destroy Viasat's own satellites." *Ibid.* But Viasat, which currently operates a single satellite "at 575km (within the 510-580 km orbital altitude range of SpaceX's satellites)" and asserts only that it "plans" to add another "within the next six to twelve months," Add28, makes no effort to substantiate its assertion that the "increased risk of harm" *to Viasat* is "substantial." Viasat Br. 20. It has therefore not shown a "demonstrably increased risk of serious environmental harm" that "actually threatens the plaintiff's particular interests," rather than threatens "the environment in general." *Bentsen*, 94 F.3d at 667. The possibility that Viasat may receive regulatory approval for additional satellites, *see* Add10, Add28, is irrelevant to its present standing. *See Turlock Irr. Dist. v. FERC*, 786 F.3d 18, 24 (D.C. Cir. 2015) (no standing based on injury that "hypothesizes as to the outcome of future legal proceedings").

American Rivers v. FERC, 895 F.3d 32, 41 (D.C. Cir. 2018) (cited at Viasat Br. 21), does not stand for the proposition that any increased risk, no matter how speculative, satisfies Article III—which it does not. *Cf. Food & Water Watch, Inc. v. Vilsack*, 808 F.3d 905, 914 (D.C. Cir. 2015) ("purely speculative increased risks" are not necessarily "deemed injurious"). Rather, the Court in that case considered whether environmental groups asserting harm to their aesthetic and recreational interests lacked standing because the project would "benefit the [river], not harm it." *Am. Rivers*, 895 F.3d at 41. The Court rejected this argument because the dispute over whether the project was beneficial or harmful went "to the merits, not standing" and because plaintiffs sufficiently alleged that "even the[] allegedly improved conditions will continue to harm their use and enjoyment of the [river]." *Ibid.*

2. The Balance Group Lacks Associational and Organizational Standing

The Balance Group likewise lacks Article III standing as either an organization or as an association on behalf of its members.

The Balance Group is not eligible for associational standing on behalf of its purported "members." The Balance Group asserts it is a

"forum for balanced research and advocacy," with "members" from various professions. Add37. But it has failed to provide facts sufficient to conclude that it is a "traditional membership association" or the "functional equivalent" of such organization. *Am. Legal Found. v. FCC*, 808 F.2d 84, 90 (D.C. Cir. 1987). For example, the Balance Group does not assert that its purported members "played any role in selecting its leadership, guiding its activities, or financing those activities." *Fund Democracy, LLC v. SEC*, 278 F.3d 21, 26 (D.C. Cir. 2002). Rather, according to the Balance Group's website, one becomes a member by joining the group's distribution list, and membership is free.[20]

Courts have repeatedly held that organizations like the Balance Group cannot claim associational standing. Thus, for example, this Court has held that an "unincorporated association that creates 'an information forum'" had no associational standing when its "members" consisted of "passive subscribers to [the group's] e-mail list and individuals who 'follow' the group's Facebook page." *Sorenson*

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[20] *See* Gov't Add. at 7-8 ("To join the Balance Group[] . . . please fill out the form below."); *id.* at 20 ("Not yet a member of the Balance Group? It is free."); *id.* at 13 (similar). The group also did not describe itself as a membership organization in its filings with the Commission. *See id.* at 27 n.3.

Commc'ns, LLC v. FCC, 897 F.3d 214, 223, 225 (D.C. Cir. 2018); *see Gettman v. DEA*, 290 F.3d 430, 435 (D.C. Cir. 2002) (no standing for magazine that claimed to represent the interests of its readers); *Fund Democracy, LLC*, 278 F.3d at 25 ("one-person business" that claimed it "'represents' an 'informal consortium' of various groups"); *Am. Legal Found.*, 808 F.2d at 90 ("media watchdog" organization without "a definable membership body"). The Balance Group cannot "premise standing on the fact that it has located certain individuals who agree with its [appeal]." *Am. Legal Found.*, 808 F.2d at 91. Even if the Balance Group has "members," the declarations submitted by the group do not state that the declarants were members at the time the Balance Group filed its appeal. *See Am. Petroleum Inst. v. EPA*, 216 F.3d 50, 64 (D.C. Cir. 2000), as amended (Aug. 18, 2000); *see* Gov't Add. 13 (announcing the Balance Group's "membership kickoff meeting" on August 23, 2021).

The Balance Group also lacks organizational standing. It does not allege that the Commission's decision to not prepare an environmental assessment "perceptibly impaired [its] ability to provide services," as necessary to show an injury to its interests for purposes of

organizational standing. *Food & Water Watch*, 808 F.3d at 919. The group describes its activities as "provid[ing] counsel and technical systems and solutions to individuals, non-profits, corporations and governments," Add37, but makes no attempt to explain how the purported deficiencies in the Commission's environmental analysis impaired those activities.[21]

The Balance Group alleges it has incurred costs "measur[ing] the impacts of the SpaceX system." Add39. If by this the Balance Group means to suggest that it is "stepping into the breach and doing what the agency should have done," such allegations are insufficient to show "the kind of harm to [its] services, daily operations, or activities that [this Court has] recognized as injury in fact." *Ctr. for Responsible Sci. v. Hahn*, 809 F. App'x 10, 12 (D.C. Cir. 2020) (internal quotation marks and citations omitted); *cf. Elec. Priv. Info. Ctr. v. Presidential Advisory Comm'n on Election Integrity*, 878 F.3d 371, 379 (D.C. Cir. 2017) ("a self-inflicted budgetary choice . . . cannot qualify as an injury in fact").

[21] The Balance Group does not even clearly allege that its injuries were caused by the purported NEPA deficiency, rather than "[t]he FCC's modification of SpaceX's license." Add38; *see also* Add41 ("Starlink as now modified is imposing costs on The Balance Group").

The Balance Group also fails to explain how its expenditures studying non-environmental issues such as "spectrum interference," "cyber-security" and unspecified "other matters," Add39, were caused by the Commission's decision to not prepare an environmental assessment. *See Elec. Priv. Info. Ctr.*, 878 F.3d at 379 (organization's expenditures on FOIA requests were not injury where agency would not have disclosed the information anyway).

B. The Commission Reasonably Found That The Record Did Not Show A Need For An Environmental Assessment

Even if Viasat and the Balance Group had standing to challenge the Order, their claims fail on the merits. After an extensive evaluation of their contentions, *Order* ¶¶ 72-92 (JA0054-0064), the Commission reasonably determined and explained that, assuming NEPA applies, the record did not show that the grant of SpaceX's modification application may have a significant environmental impact that would take the action outside the applicable categorical exclusion. *Order* ¶ 75 (JA0055). Viasat and the Balance Group contend that the Commission's evaluation ignores the potentially significant impacts that will result from (1) the deposit of alumina and other particulates in

the atmosphere (Viasat Br. 29-34) (2) the casualty risk from debris that does not fully burn up on re-entry (Viasat Br. 34-36), (3) emissions resulting from satellite launches (Viasat Br. 36-38), (4) light pollution caused by satellite operations (Viasat Br. 38-44), and (5) orbital debris (Viasat Br. 45-48). The Commission properly rejected each of these contentions.

1. The Record Does Not Show That The Potential Effects Of Alumina May Be Significant

The Commission reasonably concluded that the record was "insufficient" to determine that particulates, including alumina, resulting from reentry of SpaceX satellites "may have a significant environmental impact." *Order* ¶ 82 (JA0059). Viasat and the Balance Group contend that this determination was arbitrary in light of evidence showing that combustion of "SpaceX's satellites will produce millions of pounds of alumina" and "alumina harms the atmosphere." Viasat Br. 32. Viasat and the Balance Group contend that the question of "just how big the impact will be . . . must be answered through an environmental assessment." Viasat Br. 28. That is incorrect.

Where an activity falls within a categorical exclusion, the threshold question for determining whether to perform an

environmental assessment is whether the action may have a "significant" environmental effect. 47 C.F.R. § 1.1307(c); *see* 40 C.F.R. § 1501.4(b). If that threshold is not met, then an environmental assessment is not required. *See Utah Envtl. Cong. v. Bosworth*, 443 F.3d 732, 742 (10th Cir. 2006) (the categorical exclusion framework "plainly requires that an action first may produce a significant effect before a federal agency engage in further analysis"). Moreover, the mere "presence of some negative effects does not necessarily rise to the level of demonstrating a significant effect on the environment."[22] *Am. Wild Horse Campaign v. Bernhardt*, 963 F.3d 1001, 1009 (9th Cir. 2020) (cleaned up). In the same way that a $500 car repair may have a significant effect on one person's monthly budget but not another's, significance depends on context. *See* 40 C.F.R. § 1501.3(b).

Viasat and the Balance Group contend that alumina "absorbs more radiation from Earth than it reflects from the sun, contributing to climate change through a warming of the stratosphere and upper

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[22] The suggestion by Viasat and the Balance Group (at Viasat Br. 29 n.6) that the Commission's categorical exclusion framework is not "viable," along with similar arguments by *Amicus* Andy Lawrence, *see Lawrence Amicus Br.* 15-22, constitute an improper and untimely collateral attack on the Commission's rules.

troposphere." Viasat Br. 30. They also claim that alumina "damages the ozone layer by providing a surface for chemical reactions that contribute to ozone depletion." *Id.* at 30. But their evidence discusses the effects of satellites and rockets launched by a host of companies, which does not require a conclusion that the "effects of the proposed action"—the modification of 2,824 SpaceX satellites (and replacements)—will be significant in context of the "potentially affected environment." 40 C.F.R. § 1501.3(b); *see* 47 C.F.R. § 1.1307(c) (analysis of potential significant effects looks to the "particular action"); *City of New York v. ICC,* 4 F.3d 181, 185 (2d Cir. 1993) (in deciding whether to conduct environmental assessment of excluded activity, agency properly evaluated the effects of only the "four licenses it was considering").

For example, Viasat and the Balance Group point to generalized evidence regarding alumina released by rocket launches. *See* Viasat Br. 30 (citing JA0469, JA0475, and JA0499). They also point to evidence in the form of a poster predicting that "the reentry of satellite constellations like SpaceX's could lead to more than 22 million pounds

of alumina being dispersed." Viasat Br. 30 (citing JA0520).[23] But SpaceX disputed that the amount of alumina that could be dispersed by *its* satellites would be nearly that large. *Order* ¶ 80 & n. 328 (JA0058) (citing SpaceX April 2 Ex Parte at 5) (JA1277)) (even under a "totally unrealistic worst-case scenario," its satellites could only release "an order of magnitude less alumina than the overwrought estimates provided by Viasat"). SpaceX also explained that this would constitute an amount of alumina that would be 0.5% of the metals naturally deposited in the atmosphere by meteorites each year.[24] *See* SpaceX April 2 Ex Parte at 5 (JA1277).

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[23] Viasat and the Balance Group also cite materials generated after the adoption of the *Order*. *See* Viasat Br. 33-36. These should be given no weight. It is well settled that courts review "the reasonableness of the agency's decision on the basis of the record then before it." *Fresno Mobile Radio, Inc. v. FCC*, 165 F.3d 965, 971 (D.C. Cir. 1999).

[24] Viasat and the Balance Group maintain that the latter piece of evidence is "irrelevant" because it is not limited to alumina. Viasat Br. 33. But by providing context for the scale of metals already being deposited in the atmosphere, this submission supports a conclusion that the amount of alumina emitted by SpaceX satellites would not be significant in relation to its "setting." 40 C.F.R. § 1501.3(b)(1).

Where the evidence showed no more than that SpaceX is one of many contributors to alumina in the environment, the Commission reasonably concluded that the record did not establish the potential effects of the subset of SpaceX satellites covered by the *Order* may be significant. At best, the evidence Viasat and the Balance Group cite supports a conclusion that the potential effects of those satellites may be nonzero. But this Court has recognized that "nonzero" harms "could still be insignificant." *New York v. Nuclear Regul. Comm'n*, 681 F.3d 471, 482 (D.C. Cir. 2012).

Because the Commission found "insufficient" basis to conclude that alumina resulting from the re-entry of the SpaceX satellites at issue "may have a significant environmental impact," *Order* ¶ 82 (JA0059), this case is not like *American Bird Conservancy v. FCC*, 516 F.3d 1027 (D.C. Cir. 2008) (cited at Viasat Br. 31). In that case, the Commission rejected a petition to prepare an environmental impact statement "analyzing the effects of all past, present, and reasonably foreseeable tower registrations on migratory birds in the Gulf Coast region." *Id.* at 1029-30. Unlike here, there was "no real dispute" that

the effects of the action—in that case, the effects of all communications towers in the region—might be significant. *Id.* at 1033.

2. The Commission Reasonably Declined To Conduct Further Analysis Of Casualty Risk

The Commission reasonably concluded that it need not re-analyze the risk that SpaceX satellites may partially survive re-entry. It had "already evaluate[d]" that risk "as part of its analysis of [SpaceX's] orbital debris mitigation plans," and found that the record supported a conclusion that the "calculated risk of human casualty from materials reaching the Earth's surface" was "roughly zero." *Order* ¶ 84 & n.341 (JA0060). Where, as here, the Commission addressed the risk that SpaceX satellites might reach the ground upon re-entry as part of its public interest evaluation, it was reasonable to decline to repeat that analysis in response to Viasat and the Balance Group's environmental claims. *See Cellular Phone Taskforce,* 205 F.3d at 94 (citing *Envtl. Def. Fund v. EPA*, 489 F.2d 1247, 1257 (D.C.Cir.1973)) ("full and adequate consideration of environmental issues" can satisfy NEPA obligations without a "formal" NEPA assessment); *see also* 40 C.F.R. § 1507.3(d)(6) (recognizing that agencies' compliance with other statutes can "serve the function of agency compliance with the Act").

Viasat and the Balance Group attack the factual basis for the Commission's assessment of casualty risk. Viasat Br. 34-36. Their contentions are unavailing.

In 2019, as part of the *First Modification* proceeding, SpaceX submitted information assessing the casualty risk of its satellites. The information showed "the risk of human casualty from the re-entry of any one of its satellites meets, or exceeds, the NASA standard of 1 in 10,000." *First Modification Order* ¶¶ 23, 25 & n.71. In the course of that proceeding, SpaceX updated that information by informing the Commission that it had "developed a system architecture such that satellite components will be completely demisable"—that is, they would entirely burn up upon re-entry—"in all versions except for the initial deployment of no more than 75 satellites." *Id.* ¶ 25. The Commission found that SpaceX had satisfied its orbital debris obligations. *Id.* ¶¶ 26-27.

In the proceeding below, SpaceX assured the Commission that, consistent with its prior statements, "its satellites will be fully demisable." *See Order* ¶ 84 (JA0060). The Commission reasonably concluded that SpaceX's representations were "sufficiently supported by

the record." *Id.* ¶ 85 (JA0060). It explained that "the Bureau previously assessed the casualty risk associated with the SpaceX satellites" in the *First Modification* proceeding, and there is "no material difference between those satellites"—i.e., the modified satellites—"and the ones under consideration here."[25] *Ibid.*

Viasat and the Balance Group assert that it was arbitrary for the Commission to rely on SpaceX's representation that it had modified its satellites. Viasat Br. 28, 36. But the Commission's rules impose an enforceable duty of truthfulness on licensees, *see* 47 C.F.R. § 1.17(a)(1), (b)(1), 47 U.S.C. § 312(a), and the Commission properly relies on representations made in licensing proceedings. *See Contemp. Media, Inc. v. FCC*, 214 F.3d 187, 193 (D.C. Cir. 2000) ("[E]ffective regulation is premised upon the agency's ability to depend upon the representations made to it by its licensees").[26] In light of the record, it was reasonable

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[25] Viasat and the Balance Group mistakenly claim that the *Order* indicated that the satellites it addressed are materially the same as the "prior design." Viasat Br. 35. As the *First Modification Order* explained, the revised system architecture applied to all satellites but the first 75, *id.* ¶ 25, and nothing in the *Order* suggests that SpaceX now plans to deploy the "prior design."

[26] For the same reason, there is no merit to the contention (Viasat Br. 27) that that the Commission erred in relying on SpaceX's

for the Commission to conclude that there remained no significant unexamined risk that required additional review in response to the casualty risk concerns raised by Viasat and the Balance Group here.

3. The Commission Reasonably Declined To Conduct Further Analysis Of Launch Emissions

The record also belies the assertion by Viasat and the Balance Group that the Commission "entirely failed to consider the environmental effects of launching thousands of satellites." Viasat Br. 36. On the contrary, the Commission considered the issue and concluded it need not conduct an environmental assessment of launch emissions because the Federal Aviation Administration had already prepared an environmental assessment that evaluated SpaceX launches. *Order* ¶ 82 (JA0059) (citing 47 C.F.R. § 1.1311(e)).

The Commission's reliance on the Federal Aviation Administration's environmental assessment was reasonable. Under the Commission's rules, an environmental assessment "need not be submitted to the Commission if another agency of the Federal [g]overnment has assumed responsibility for determining whether . . .

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representation that it complies with the Commission's radiofrequency rules. *Order* ¶ 91 (JA0064) (citing 47 C.F.R. § 1.1307(b)).

the facilities in question will have a significant effect on the quality of the human environment." 47 C.F.R. § 1.1311(e). That is the case here. The Federal Aviation Administration is the agency that "licenses and regulates U.S. commercial space launch and reentry activity."[27] Final Environmental Assessment and Finding of No Significant Impact for SpaceX Falcon Launches at Kennedy Space Center and Cape Canaveral Air Force Station at 1, 6 (July 2020) (FAA Environmental Assessment) (JA0308, JA0313).[28] The environmental assessment explains that the Federal Aviation Administration is "responsible for analyzing the potential environmental impacts" of SpaceX's launches, and did so in the environmental assessment on which the Commission relied. *Id.* at 6 (JA0313); *see* 40 C.F.R. § 1501.7 (authorizing lead agencies).

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[27] The Secretary of Transportation has the authority to license commercial space launches. *See* 51 U.S.C. § 50901(b)(3). That authority has been delegated to the FAA by regulation. *See* 14 C.F.R. Part 400. The Commission explained that although it "authorizes deployment and operation of space stations, the [Federal Aviation Administration] is the agency authorized to issue launch licenses." *Order* n.309 (JA0056).

[28] https://www.faa.gov/space/environmental/nepa_docs/media/SpaceX_Falcon_Program_Final_EA_and_FONSI.pdf

Viasat and the Balance Group contend the Federal Aviation Administration's analysis was deficient because it did not consider the impact of SpaceX's launch emissions on the ozone layer. Viasat Br. 37. But where the Federal Aviation Administration had "assumed responsibility," 47 C.F.R. § 1.1311(e), for evaluating the environmental effects of SpaceX's launches and had found no significant impact, the Commission reasonably concluded that it was not required under its rules to conduct its own assessment of launch emissions. *Order* ¶ 82 (JA0059); *cf. Sierra Club*, 827 F.3d at 68 (agency was not required to analyze the environmental effects of the gas exports that a different agency had the "legal authority to authorize").

4. The Commission's Conclusion Regarding Effects On the Night Sky Was Reasonable

The Commission recognized that SpaceX's satellites may affect astronomy and the night sky, but also that SpaceX had "diminished the average brightness of its satellites" and "made commitments to the astronomy community regarding further reduction in the visibility of its satellites." *Order* ¶ 87 (JA0062). The record before the Commission contained evidence from the American Astronomical Society that SpaceX was "in fact mitigating the effects of its constellation." *Order*

¶ 86 & n.353 (JA0062). The Commission therefore concluded that the record on the issue "d[id] not justify the need for an [environmental assessment]." *Order* ¶ 87 (JA0062).

This conclusion was reasonable. NEPA's implementing regulations explain that further review of a categorically excluded action is not required where, as here, the "agency determines that there are circumstances that lessen the impacts or other conditions sufficient to avoid significant effects." 40 C.F.R. § 1501.4(b)(1); *see also Sierra Club v. Van Antwerp*, 661 F.3d 1147, 1154, 1156 (D.C. Cir. 2011), as amended (Jan. 30, 2012) (applying the "general principle of taking mitigation into account" in assessing potential environmental effects). Given SpaceX's efforts to address the impacts of its satellites on the night sky and astronomy, it was reasonable to conclude that the issues did not justify further review through an environmental assessment. *See City of New York*, 4 F.3d at 186 (in declining to require an environmental assessment for bus operating licenses that otherwise would be covered by a categorical exclusion, agency reasonably relied on potential for mitigation).

Viasat and the Balance Group recognize that mitigation can "obviate[] the need for additional review," but assert the Commission "never made a finding" that effects would not be significant. Viasat Br. 41. This is incorrect: the Commission's conclusion that the "robust record" did not show a need for an environmental assessment means it found no basis to conclude "that the action may have a significant environmental impact." 47 C.F.R. § 1.1307(c). That record included evidence that "lowering the altitude of the SpaceX satellites to below 600km will significantly reduce the amount of time those satellites reflect sunlight during the night, thereby lessening their impact on astronomy"; that SpaceX was providing tracking information to astronomers to help them avoid its satellites; that SpaceX was implementing measures to make its satellites "all but invisible to the naked eye," and that SpaceX was "working in close collaboration with the astronomy community." *Order* ¶ 86 (JA0060).

Viasat and the Balance Group also assert that, contrary to the Commission's conclusion, the "evidence shows" that the effects may be significant. Viasat Br. 41. But the evidence they cite does not evaluate the potential effects of the approximately 3,000 satellites at issue.

Rather, it addresses the effects of a much larger number of satellites on astronomy, *see* Viasat Br. 38-40 (citing, e.g., JA0747 (discussing potential effects of 50,000 satellites), JA0544 (similar), JA1009 (discussing impact of satellites deployed by "a variety of companies")), and the effects of "light pollution" from a range of sources, such as streetlights, *see* Viasat Br. 39-40 (citing, e.g., JA0997) This evidence does not undermine the Commission's conclusion that the operations of the SpaceX satellites at issue, as mitigated, will not have significant effects.[29]

Nor is the Commission's commitment to monitor SpaceX's efforts to minimize its impacts a "tacit acknowledgement of the potential for significant risk," as Viasat and the Balance Group contend. Viasat Br. 44. Although the Commission concluded that the effects on the night

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[29] The Commission did cite record support for the reduction in brightness of SpaceX's satellites, contrary to Viasat and the Balance Group's claims (at Viasat Br. 42). *See Order* n.351 (JA0061) (citing SpaceX April 2, 2021 Ex Parte Attach at 3) (JA1285) (chart comparing brightness of "original 2019" satellites having a median magnitude of 4.99, with "more recent" satellites with a median magnitude of 6.48)). (Higher apparent magnitude values represent objects appearing dimmer. *Order* n. 351 (JA0061)). Viasat and the Balance Group do not explain how this evidence is "contradict[ed]," Viasat Br. 42, by an article (published approximately a year before SpaceX's submission) that discusses the average brightness of SpaceX's satellites at that time.

sky would not be significant based on SpaceX's ongoing efforts and "commitments to the astronomy community," *Order* ¶ 87 (JA0062), it was reasonable for it to conclude that it should monitor the situation to ensure that the steps designed to avoid any significant effects were fulfilled. *See Am. Wild Horse Campaign*, 963 F.3d at 1010 (agency's decision to study potential effects of an action is "not evidence that the effects . . . might be significant").

5. The Commission Reasonably Declined to Conduct Further Analysis of the Risks of Debris in Orbit

The *Order* examined issues related to "the orbital debris environment" as part of its review of SpaceX's updated orbital debris mitigation plan. *Order* ¶ 53 (JA0045); *see also id.* ¶¶ 53-71 (JA0045-0054). The Commission concluded that SpaceX had sufficiently minimized the risk of collision and resulting debris in orbit, for three reasons: (1) SpaceX satellites "would have propulsion and would be maneuverable," (2) satellites "that reach the end of their mission" would be moved to a lower altitude "in order to hasten atmospheric re-entry," and (3) even if some satellites lost maneuverability, "atmospheric drag" would ensure that SpaceX satellites at the modified, lower altitude

would be removed from orbit within short time frames. *Id.* ¶ 53 (JA0045).

The Commission reasonably concluded that where it had "reviewed SpaceX's orbital debris mitigation plan," and concluded that the plan was in the "public interest," *id.* ¶ 89 (JA0063), it need not repeat that review in responding to Viasat and the Balance Group's environmental concerns. The Commission's approach was reasonable in light of its "full and adequate consideration" of the issue. *See Cellular Phone Taskforce*, 205 F.3d at 94; *Mayo*, 875 F.3d at 20 (agencies may properly consider "the usefulness of any new potential information to the decisionmaking process").

Viasat and the Balance Group assert that the Commission's analysis was "incomplete" because the Commission never determined the "precise level of risk" presented by SpaceX. Viasat Br. 47 (citing *Order* ¶¶ 58, 61, 63-64) (JA0047, JA0049, JA0050-0051). But as the *Order* paragraphs they cite explain, collision risk assessment "necessarily involves estimates" because it turns on the number of SpaceX satellites that are launched and the number of those launched satellites that fail, which cannot be predicted with precision in advance.

Order ¶¶ 63-64 (JA0050-0051). It was not arbitrary for the Commission to estimate the risk of orbital debris from SpaceX satellites based on evolving data, and it does not demonstrate a gap that an environmental assessment must fill.[30] *See Sierra Club v. U.S. Dep't of Energy*, 867 F.3d 189, 196-197, 200 (D.C. Cir. 2017) (in assessing the environmental impacts of natural gas exports whose volume was difficult to predict, agency was not required to "tailor its review . . . to any particular volume of exports"). Viasat and the Balance Group also assert that the Commission's orbital debris rules "need to be updated," Viasat Br. 48, but this does not undermine the Commission's reliance on its current rules, particularly because SpaceX's authorization is subject to modification to ensure compliance with any updated rules. *Order* ¶ 97w (JA0068).

In sum, the Commission reasonably concluded that the categorical exclusion properly applied to the proposed action. It carefully considered the environmental issues raised and concluded that the

[30] Neither is a decision based on informed estimates one based on uncertainty, as Viasat and the Balance Group contend (Viasat Br. 24-25).

record did not demonstrate that the satellites covered by the *Order* may have significant effects that required additional review.[31]

[31] If this Court nonetheless were to find that the Commission's analysis was insufficient, the proper remedy would be to remand without vacating the *Order*. *See Vecinos para el Bienestar de la Comunidad Costera v. FERC,* 6 F.4th 1321, 1332 (D.C. Cir. 2021). There is every reason to think that the Commission could redress any infirmities in its explanation on remand. *See id.* On the other hand, vacatur would be highly disruptive to SpaceX as well as the "remote and underserved" communities that would benefit from its service. *See Order* ¶ 13 (JA0024).

CONCLUSION

The appeals and petition for review should be denied.

Dated: October 26, 2021

Respectfully submitted,

/s/ Rachel Proctor May

Richard A. Powers
Acting Assistant Attorney General, Antitrust Division

Todd Kim
Assistant Attorney General, Environment and Natural Resources Division

Robert B. Nicholson
Robert B. Wiggers
Justin Heminger
Allen Brabender
Attorneys

U.S. DEPARTMENT OF JUSTICE
950 Pennsylvania Ave. NW
Washington, DC 20530

*Counsel for Respondent United States of America**

P. Michele Ellison
Acting General Counsel

Jacob M. Lewis
Associate General Counsel

James M. Carr
Rachel Proctor May
Counsel

FEDERAL COMMUNICATIONS COMMISSION
45 L Street NE
Washington, DC 20554
(202) 418-1740
fcclitigation@fcc.gov

Counsel for Appellee/Respondent Federal Communications Commission

* Filed with consent pursuant to D.C. Circuit Rule 32(a)(2).

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/s/ Rachel Proctor May
Rachel Proctor May
Counsel for Appellee/Respondent

ADDENDUM TO THE BRIEF OF THE FEDERAL COMMUNICATIONS COMMISSION AND THE UNITED STATES OF AMERICA

Contents

Declaration of Rachel Proctor May

Nos. 21-1123 (and consolidated cases 21-1125, 21-1127, 21-1128)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

VIASAT, INC.,
Appellant,

v.

FEDERAL COMMUNICATIONS COMMISSION,
Appellee/Respondent,

THE UNITED STATES OF AMERICA,
Respondent,

SPACE EXPLORATION HOLDINGS, LLC,
Intervenor.

On Notices of Appeal and Petition for Review of an Order of the Federal Communications Commission

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DECLARATION OF RACHEL PROCTOR MAY

I, Rachel Proctor May, hereby declare as follows:

1. I am an attorney at the Federal Communications Commission and a member in good standing of the bar of the District of Columbia. I submit this declaration in support of the brief of the

Federal Communications Commission and the United States of America in the above-captioned matter.

2. Attached as Exhibit 1 is a true and correct copy of the Balance Group website page https://www.thebalancegroup.net/index.html#membership, printed to PDF format on August 26, 2021.

3. Attached at Exhibit 2 is a true and correct copy of the Balance Group website page https://www.thebalancegroup.net/news, printed to PDF format on August 26, 2021.

4. Attached as Exhibit 3 is a true and correct excerpt of Opposition to SpaceX Application for Major Modification, filed by the Balance Group in the FCC proceeding IBFS File No. SAT-MOD-20200417-00037 on May 26, 2020.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 21, 2021

/s/ *Rachel Proctor May*
Rachel Proctor May

EXHIBIT 1

Are you concerned that massive satellite and wireless networks need further study? The Balance Group exists to provide a balanced approach to solving large, systemic issues concerning existing and proposed man-made systems and their impact on the human condition and the environment at large. Technology and large-scale networks provide certain benefits that we all rely upon, yet the same existing or proposed networks and systems can degrade the human condition and surrounding environment. This is the forum for balanced research and advocacy for respecting the need for technology while also improving the human and environmental condition.

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OUR MISSION

The Balance Group is designed to provide counsel and technical systems and solutions to individuals, non-profits, corporations, and governments. The technical solutions use professional-grade spectrum management techniques and are designed to protect industry, humans, flora, and fauna. It is in the interest of network providers, customers, regulators, environmentalists, and healthcare providers to persistently seek balanced solutions that benefit all parties.

OUR PROCESS

Networks are analyzed both prior to being approved for deployment and also during their operational and post-operational phases.

Our technology and advocacy ensures that satellite and terrestrial broadband and other radio-frequency transmission networks are subjected to proven, peer-reviewed science, and the elimination of systemic risks to industry, human beings and the environment.

OUR MEMBERS

Because the Balance Group exists to provide a balanced approach to proposed manmade systems and their impact on the human condition and the environment at large, we require

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members from a wide variety of professions and interests. Our members include astronomers, physicists, scientists, environmentalists, technologists, telecommunications experts and medical professionals, among others. Our members are also people interested in balancing the needs for technology with those of healthy ecosystems and a clean environment.

The Balance Group's work is designed to protect industry, humans, flora, fauna, and the environment from preventable environmental harms. The Balance Group's advocacy seeks to ensure that satellite and terrestrial broadband and other radio-frequency transmission networks are subjected to proven, peer-reviewed science, to reduce systemic risks to industry, human beings, and the environment.

JOIN US!
BECOME A MEMBER

Members receive reports and an inside track on the latest legal and technical concerns. Members also receive privileged information on suggested solutions for identifying, addressing and reversing the harms and potential harms stemming from large-scale, man-

made networks (including and not limited to, satellite-mega constellations, systems that create systemic light-pollution, systems that contribute to deforestation and habitat destruction, systems that harm human health, systems that harm flora and fauna).

To join the Balance Group's growing roster of participants seeking a balanced approach to solving large, systemic issues concerning existing and proposed man-made systems and their impact on the human condition and the environment at large, please fill out the form below.

** INDICATES REQUIRED FIELD*

NAME *

First

Last

EMAIL *

SUBMIT

OPTIONAL - Share Your Skills or Advice

Do you have skills or advice you would like to share? The Balance Group is always interested in its members' skill sets. Do you have an educational, work or volunteering background in astronomy, computer science, cyber-security, education, engineering, environmental protection, healthcare, graphic arts, law, regulatory compliance, science, technical writing, or telecommunications? If so, please let us know!

** INDICATES REQUIRED FIELD*

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NAME *

First

Last

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SUBMIT

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LEARN ABOUT MEMBERSHIP

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EXHIBIT 2

NEWS

Webinar: Membership Kick-off Meeting August 23, 1PM

8/18/2021

NEW WEBINAR

MEMBERSHIP KICKOFF MEETING

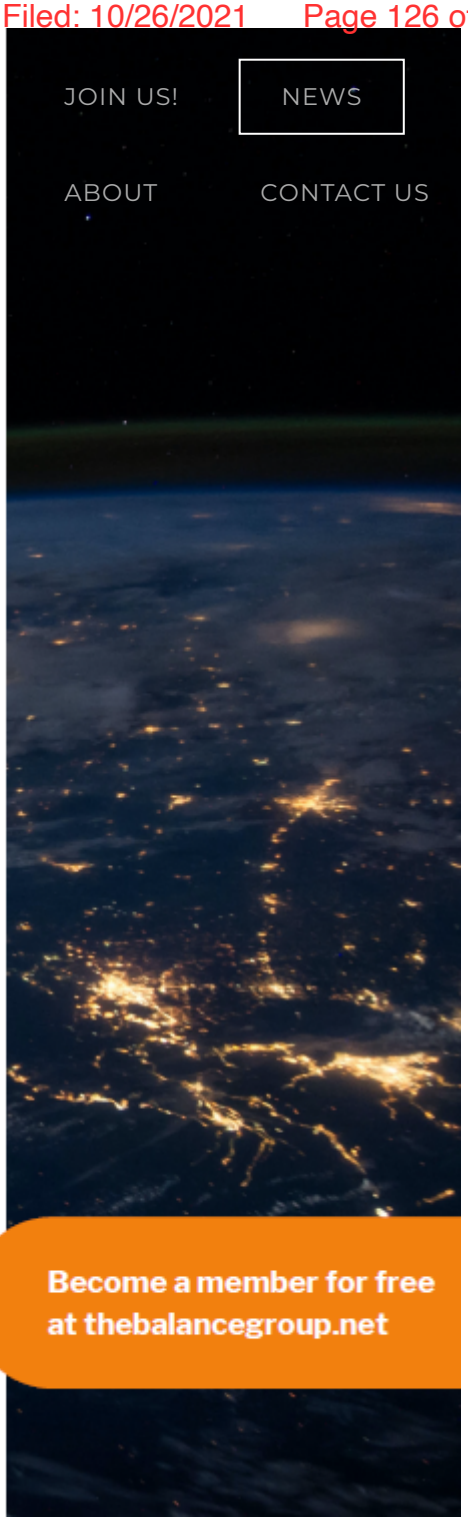
August 23rd, 2021
1:00PM - 2:00PM ET

BETTER, CLEANER, NETWORKS FOR US ALL

Join The Balance Group for a members-only kickoff webinar with an exclusive report on:

- key existing and planned satellite and wireless networks,
- early results on Balance Group research & development and advocacy initiatives,
- as well as introductions to the leadership team, and a
- mission statement recap.

How to attend: Members are being sent (via email) calendar notice invitations with a participation weblink. Non-members can still register to become members.



Link to Webinar Flyer

Court in 5G Radiofrequency Radiation Case: FCC failed to properly study harms

8/13/2021

Human and Environmental Radiofrequency Protection Ruling: The DC Circuit court ruled today that the FCC "failed to provide a reasoned explanation for its determination that its guidelines adequately protected" humans from negative health effects unrelated to cancer.. In *Environmental Health Trust/Childrens Health Defense v. FCC,* the court also stated the FCC showed "a complete failure to respond to comments concerning environmental harm caused by RF radiation." Two amicus briefs were filed in the case by Balance Group co-founders. Jim Turner and Julian Gresser filed on behalf of the *Building Biology Institute*. Stephen L. Goodman filed on behalf of *Joseph Sandri*.

LINK to Ruling

The Balance Group's legal brief (jointly with ViaSat) challenging the FCC's approving the launch of the largest satellite mega-constellation in human history because its impacts remain largely unstudied

8/6/2021

BRIEF OF APPELLANTS VIASAT, INC. AND THE BALANCE GROUP

Nos. 21-1123, -1125, -1128

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

VIASAT, INC.,

Appellant,

v.

FEDERAL COMMUNICATIONS COMMISSION,

Appellee,

SPACE EXPLORATION HOLDINGS, LLC,

Intervenor for Respondent.

THE BALANCE GROUP,

Appellant,

v.

FEDERAL COMMUNICATIONS COMMISSION,

Appellee,

SPACE EXPLORATION HOLDINGS, LLC,

Intervenor for Respondent.

On Appeal from the Federal Communications Commission
IBFS File No. SAT-MOD-20200417-00037

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viasat.bg_--_opening_brief.pdf
Download File

Declarations:

1. Dr. Christopher Baddiley. Dr. Baddiley earned a Ph.D. in astrophysics from University College London (UCL) in 1973, and a B.S. with Honors in Physics from Newcastle University in 1969. Currently I teach a U3A course in astrophysics and am a Fellow with the Royal Astronomical Society (RAS) and a member of the International Astronomical Union (IAU).

2. Dr. Roger Malina. Dr. Malina earned a Bachelor of Science in physics from Massachusetts Institute of Technology in 1972, and a Ph.D. in Astronomy from the

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University of California, Berkeley, in 1979. Formerly the Principal Investigator for the NASA Extreme Ultraviolet Explorer Satellite at the University of California, Berkeley, and the former director of the Observatoire Astronomique de Marseille Provence (OAMP) and of the Laboratoire d'Astrophysique de Marseille in Marseille, France, and member of its observational cosmology group, which investigates the nature of dark matter and dark energy. He is currently distinguished professor of arts and technology, and professor of physics at the University of Texas at Dallas, and a Directeur de Recherche in the CNRS at the University of Aix Mareseille.

3. Mark Dankberg. Mr Dankberg is the Chairman of the Board and Executive Chairman of Viasat, Inc.. He co-founded the company in 1986, and served as its CEO from 1986 until assuming his current role in November 2020. Mr. Dahlberg earned a Bachelor of Science in Electrical Engineering and a Master of Electrical Engineering from Rice University, and is a member of the Rice University Electrical and Computer Engineering Hall of Fame. In 2017, he was elected to the National Academy of Engineering for my contributions to broadband internet communications via satellite.

4. Joseph Sandri. Mr. Sandri is a co-founder of Appellant, The Balance Group, and currently its operating officer. He is also Chief Executive Officer of Thought Delivery Systems, Inc., a privately held technology conglomerate based in Silver Spring, Md.; president of the National Spectrum Management Association (NSMA) (www.nsma.org); and a board member of the Archangel Ancient Tree Archive (www.AncientTreeArchive.org).

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Nos. 21-1123, -1125, -1128

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

VIASAT, INC.,

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FEDERAL COMMUNICATIONS COMMISSION,

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Intervenor for Respondent.

On Appeal from the Federal Communications Commission
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August 3, 2021

8/3/2021

$65 Billion for Telecommunications Infrastructure: Is this an opportunity to make sure that broadband infrastructure is built in a manner which protects flora and fauna?

THE WALL STREET JOURNAL.

BUSINESS

Cable, Internet Companies Stand to Gain From Broadband Funding in Infrastructure Bill

The $1 trillion infrastructure bill includes $65 billion to improve internet access for poor and isolated communities

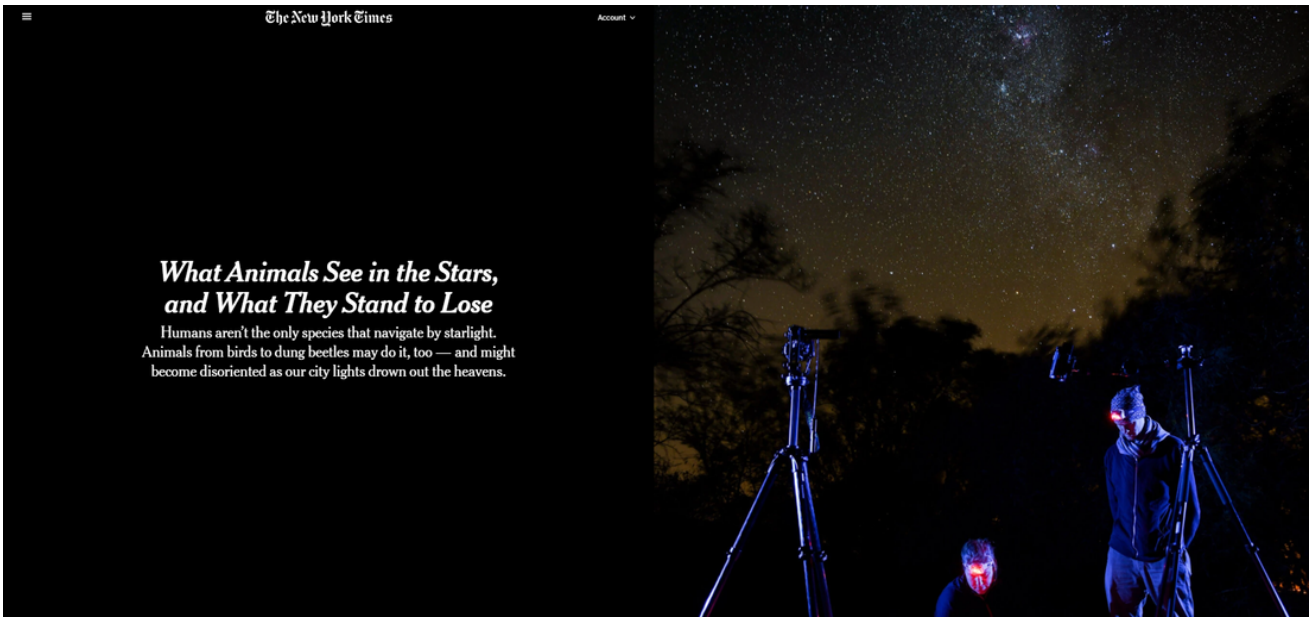
The $1 trillion infrastructure bill moving through the Senate this week stands to be a windfall for cable and fiber-optic internet companies, with $65 billion allocated to improve internet access for poor and isolated communities. The plan would help home internet providers by providing $40 billion in grants that states can dole out to operators that expand their networks to households that lack high-speed service. AT&T plans to self-fund its fiber-optic network expansion to cover millions of new locations in the coming years. Its chief executive, John Stankey, has said government support in other areas would be "icing on the cake." Charter Chief Executive Tom Rutledge has said the cable company can expand its network efficiently with help from government subsidies. There are still some provisions that broadband providers will likely chafe at, including proposed rules that force them to plainly disclose the service levels and prices they offer. Another provision withholds funding from carriers that suffer long network outages. But reporting and reliability requirements aren't likely to dent the bottom lines of broadband companies that already deal with armies of regulators.

LINK: Cable, Internet Companies Stand to Gain From Broadband Funding in Infrastructure Bill | Benton Institute for Broadband & Society

Gov't Add. 18

New York Times: What Animals See in the Stars and What They Stand to Lose

8/2/2021



LINK: What Animals See in the Stars, and What They Stand to Lose - The New York Times (nytimes.com)

Set Your Calendars:

7/30/2021

WHO: Members Only
WHAT: The Balance Group Webinar

-Exclusive report: Risk profiles on key existing and planned satellite and wireless networks
-Balance Group Mission Statement recap
-Early Results (prior to public release) on Balance Group Research & Development and Advocacy Initiatives

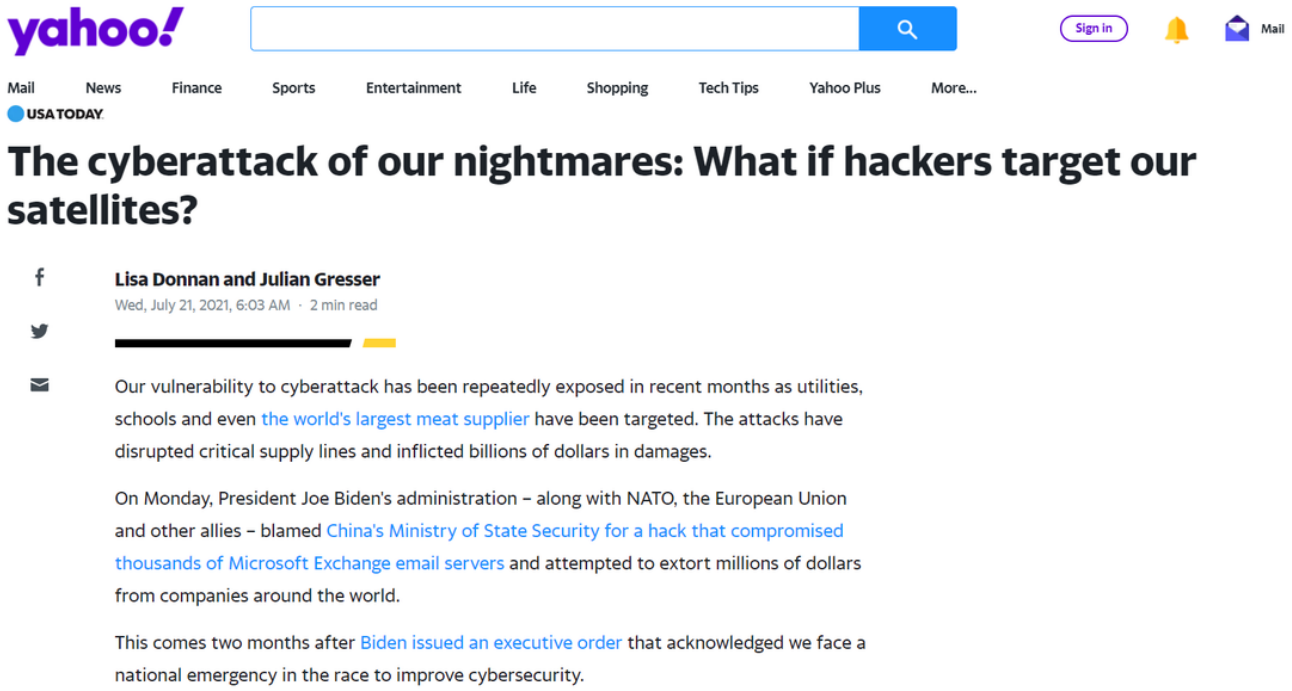
WHEN: Monday, August 23, 2021, 1:30pm Eastern (10:30am Pacific)
HOW: All Balance Group Members will be emailed a calendar invitation and participation

link. Not yet a member of the Balance Group?

It is free. Click: https://www.thebalancegroup.net/index.html#membership

The cyberattack of our nightmares: What if hackers target our satellites?

7/21/2021



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USA TODAY

The cyberattack of our nightmares: What if hackers target our satellites?

Lisa Donnan and Julian Gresser

Wed, July 21, 2021, 6:03 AM · 2 min read

Our vulnerability to cyberattack has been repeatedly exposed in recent months as utilities, schools and even the world's largest meat supplier have been targeted. The attacks have disrupted critical supply lines and inflicted billions of dollars in damages.

On Monday, President Joe Biden's administration – along with NATO, the European Union and other allies – blamed China's Ministry of State Security for a hack that compromised thousands of Microsoft Exchange email servers and attempted to extort millions of dollars from companies around the world.

This comes two months after Biden issued an executive order that acknowledged we face a national emergency in the race to improve cybersecurity.

Read the entire article: The cyberattack of our nightmares: What if hackers target our satellites?

Upcoming Balance Group Webinar: August 23rd, 2021

7/6/2021

Join The Balance Group for an informational webinar that will provide news about its research & development initiatives, and also progress regarding its various legal filings. Becom a member (click the "Join Us!" or "Membership" buttons on the home page) to stay tuned on how to register for this event and join the conversation with industry leaders.

BALANCE GROUP ACTIVITIES RECAP

6/14/2021

Status Report: As of December 31, 2020, the Balance Group has met the following goals:

1. Established a process for conducting professional-grade radio-frequency (RF) emissions studies using calibrated instrumentation. This provides us with the ability to measure compliance with the FCC's mandated requirements (Human RF exposure and also in preventing interference into other networks).
2. Built tools available to the public, governments, industry, and the environmental, healthcare, and business communities for assessing radio-frequency (RF) liability protection.
3. These tools and processes were made available to the Balance Group through a working relationship with Cardinal Communications, and Division of Thought Delivery Systems, Inc.
4. Produced a system for expanding its ongoing outreach to the wireless experts in the scientific, engineering, regulatory, governmental and public interest communities.

The Balance Group Files a Notice of Appeal

5/27/2021

The Balance Group files a Notice of Appeal in the Federal Court of Appeals for the Washington DC Circuit concerning the FCC's ruling to approve a major modification to the world's largest planned satellite network without an environmental impact assessment as required by NEPA, let alone any apparently reasonably sufficient safeguards concerning cybersecurity, insurance and other protections.

Click here to view the full document.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

THE BALANCE GROUP Appellant, v. FEDERAL COMMUNICATIONS COMMISSION, Appellee.	Case No. 21-1128

NOTICE OF APPEAL

Pursuant to 47 U.S.C. § 402(b) and (c) and Rule 15(a) of the Federal Rules of Appellate Procedure, The Balance Group ("BALANCE GROUP") hereby files a

<<Previous

EXHIBIT 3

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

In the matter of SpaceX Services Corporation,	)	
	)	**(SAT-MOD-20200417-00037)**
	)	**(CALL SIGNS: S2983/3018)**
Application for Major Modification	)	

OPPOSITION TO SPACEX APPLICATION FOR MAJOR MODIFICATION; AND MOTION FOR CONSULTATION WITH AFFECTED AGENCIES; MOTION FOR DISCLOSURE; MOTION FOR CERTIFICATION OF SUITABLY COMPREHENSIVE INSURANCE COVERAGE; MOTION FOR CERTIFICATION OF INDEMNITY AND MOTION TO SUSPEND OR REVOKE LICENSES

by the BALANCE GROUP

James S. Turner
Swankin & Turner
1601 18th St NW #4
Washington, DC 20009
jim@swankin-turner.com
Mobile: 202-462-8800

Julian Gresser, Of Counsel
Swankin & Turner
P.O. Box 30397
Santa Barbara, CA 93130
juliangresser77@gmail.com
Office: 805-708-1864

Raymond Broomhall
Michael Kirby Chambers
49 Davey St.
Hobart, Tasmania, Australia
rjbroomhall@hotmail.com
Mobile: +61 44 772 5254

Joseph Sandri
James McPherson
Thought Delivery Systems, Inc.
8070 Georgia Avenue, Suite 301
Silver Spring, MD 20910
joe@thoughtdelivery.com
Office: 202-223-1028

May 26, 2020

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SUMMARY

In the instant proceeding Space Exploration Holdings, LLC (SpaceX) seeks to modify its Ku/Ka-band Non-Geostationary Orbiting (NGSO) license to relocate 100 percent of its NGSO satellites currently authorized to "operate at altitudes from 1,110 km to 1,325 km down to altitudes ranging from 540 km to 570 km, and to make related changes."[1]

Under 47 CFR, especially but not limited to Parts 1 and 25, and the powers delegated to the International Bureau, it is now apparent that the SpaceX Major Modification application evidences a *prima facie* case requiring that the major modification not be granted, and calling into question the project's core propositional integrity and planning. SpaceX and the International Bureau need to divulge critical and material information missing from the record. Proof that the SpaceX system carries adequate insurance against numerous reasonably foreseeable systemic and catastrophic failures needs to be provided. Proof that the citizens and the government of the United States are indemnified against any material systemic or catastrophic failures caused by the SpaceX system as proposed for modification is necessary. Over a dozen impacted federal agencies must be forthwith contacted and effectively consulted with in their impacted areas of expertise and jurisdiction. The SpaceX launches must be immediately suspended along with a suspension or revocation of Call Signs S2983 and S3109, until and if baseline, material licensure and operational requirements are certified as satisfied by the appropriate authorities of jurisdiction in a manner keeping with U.S. Law and Treaty Obligations.

[1] See: APPLICATION FOR MODIFICATION OF AUTHORIZATION FOR THE SPACEX NGSO SATELLITE SYSTEM, SAT-MOD-20200417-000037, Call Signs S2983/3018, (SpaceX Major Modification Application) (dated April 17, 2020), Space Exploration Holdings, LLC.

The SpaceX network, as approved and as planned, is designed as the largest satellite system in the Earth's history, as measured by publicly available records. In fact, if the current authorizations are fully deployed, SpaceX's systems will consist of five times the number of satellites than all the world's currently operational networks (domestic and international) combined.[2] As such, the regulatory agencies overseeing the potential impacts of approving or assessing the deployment, hold a heightened duty of care and vigilance, pursuant to domestically and internationally recognized precautionary principles. The BALANCE GROUP[3] Opposition and motions listed herein are meant to be useful to the Federal Communications Commission, SpaceX, the public, and the public's additional representatives in assessing material issues of security, health, safety and welfare, related to approving, funding, insuring, constructing, and operating the proposed network, or similar networks.

Critical information is missing. The missing information includes and is not limited to matters of: national security; environmental impacts; proof that suitable insurance and indemnification exists against a number of material and readily-identifiable systemic and catastrophic harms; evidence that minimally acceptable confirmed coordination, written assessments, and permissions were secured with other federal agencies that have subject matter jurisdiction — not to mention a variety of other requirements on the face of the license.

[2] In 2004, all the world's satellite systems combined totaled 800 satellites in operations, and by April 2020, there were approximately 2,200 satellites in orbit, according to the April 23, 2020, Statement of FCC Commissioner Rosenworcel, (*Mitigation of Orbital Debris in the New Space Age*, Report & Order and Further Notice of Proposed Rulemaking, IB Docket No. 18-313).The combined SpaceX satellite authorizations permit deployment of 11,927 satellites during the course of their license terms (4,409 satellites through Call Sign S2983/S3018 and 7,518 satellites through Call Sign S2992).

[3] The BALANCE GROUP is designed to provide counsel and technical systems and solutions to individuals, non-profits, corporations, and governments. Its mission is to ensure that satellite and terrestrial broadband and other radio-frequency transmission networks and technologies are proven, through peer-reviewed science, to not pose a material risk of systemic harm to human beings or the environment both prior to being approved for deployment and also during their operational and post-operational ("space debris") phases.