

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Comprehensive Review of Licensing and) IB Docket No. 12-267
Operating Rules for Satellite Services)

To the Commission:

REPLY COMMENTS OF SPACEX

Space Exploration Technologies Corp. (“SpaceX”), by its counsel, hereby submits its Reply Comments regarding the Federal Communications Commission’s (“FCC” or “Commission”) *Further Notice of Proposed Rulemaking* (“FNPRM”) in the above-captioned proceeding.¹ SpaceX welcomes the opportunity to provide its views on certain issues raised by initial commenters in this proceeding.

I. INTRODUCTION

SpaceX, the world’s fastest growing launch services company, was founded in 2002 with the goal of revolutionizing space transportation and space technologies, with particular regard to reliability, safety, and affordability. Over the past decade, SpaceX has gained worldwide attention with a series of historic milestones in space transportation and related space technologies, including the successful development, manufacture, and launch of its Falcon 9 rocket and Dragon spacecraft to regularly and repeatedly carry cargo to and from the

¹ See *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, Further Notice of Proposed Rulemaking, IB Docket No. 12-267, FCC 14-142 (Sept. 30, 2014) (“FNPRM”).

International Space Station (“ISS”). SpaceX has grown to more than 4,000 employees and is headquartered in Hawthorne, California where the company manufactures its launch vehicles and Dragon spacecraft, with launch and satellite processing facilities at Cape Canaveral Air Force Station, Florida and Vandenberg Air Force Base, California, and a structural and propulsion development facility in McGregor, Texas.

SpaceX recently announced plans to extend its commitment to innovation in commercial space technologies by implementing a global network of non-geostationary orbit (“NGSO”) communications satellites, which it will manufacture, launch and operate.² SpaceX will be a new entrant in the satellite services market, providing low-cost, high-speed broadband Internet service throughout the United States and around the globe. The development, construction and launch of this network will employ a large number of highly-skilled workers at a new satellite manufacturing center in Seattle, Washington.

The *FNPRM* initiated a proceeding to update and streamline the Commission’s regulations under Part 25, which governs the licensing and operation of space stations and earth stations for the provision of satellite communication services. The Commission seeks to simplify its rules to make the regulatory approval process for satellite licensing easier and more efficient. SpaceX appreciates the opportunity to comment in this proceeding and welcomes changes to the Commission’s rules that will streamline the approval process and enhance competition, particularly as it pertains to NGSO broadband satellite networks and their associated user terminals.

² “SpaceX To Build 4,000 Broadband Satellites in Seattle.” *Space News*. January 19, 2015 (accessible at: <http://spacenews.com/spacex-opening-seattle-plant-to-build-4000-broadband-satellites/#sthash.Xsqm3Vdd.dpuf>).

II. STREAMLINED PART 25 RULES SHOULD ENHANCE COMPETITION AND FACILITATE NEW NGSO BROADBAND SATELLITE ENTRANTS

SpaceX has announced plans to deploy a large NGSO broadband satellite network operating in Ku-band and Ka-band frequencies. This innovative system will support the objectives of the current U.S. Presidential Broadband Initiative by providing broadband Internet access to fixed and mobile users in the United States and at potentially every location on the planet, providing equitable access even to the most rural and remote areas.³

Facilitating broadband innovation and enhancing competition are two fundamental policy goals long-held by the Commission because they result in lower costs and new service applications for U.S. consumers and businesses. The Commission should take every measure possible to increase competition and facilitate innovation in the satellite market by affording potential entrants – regardless of technology, frequency band or incumbency status – the benefits of streamlined Part 25 rules.⁴ Critically, changes to space station and earth station licensing rules should not undermine the ability of *bona fide* NGSO broadband satellite entrants to operate in Ku-band and Ka-band spectrum. Any further expansion of NGSO broadband satellite

³ See Press Release, *Fact Sheet: Broadband That Works: Promoting Competition & Local Choice In Next-Generation Connectivity*, White House Office of the Press Secretary (Jan. 13, 2015), available at <http://www.whitehouse.gov/the-press-office/2015/01/13/fact-sheet-broadband-works-promoting-competition-local-choice-next-gener>.

⁴ In this regard, extensive GSO operations have been conducted in Ku-band and Ka-band frequencies for years, and limited Ka-band NGSO operations have been permitted in the United States pursuant to waivers based on findings that these operations can accommodate future entrants. See Application of O3b Limited for Authority to Operate Earth stations Aboard Maritime Vessels to Communicate with its Non-Geostationary Satellite System, Call Sign E1300198, File No. SES-LIC-20130528-00455; see also Application of O3b Limited for O3b Limited for Authority to Operate a Gateway Earth Station in Haleiwa, Hawaii with its Non-Geostationary Ka-Band Satellite System, Call Sign E100088, File No. SES-LIC-20100723-00952 (granted Sept. 25, 2012) and Application of O3b Limited for O3b Limited for Authority to Operate a Gateway Earth Station in Vernon, Texas with its Non-Geostationary Ka-Band Satellite System, Call Sign E130021, File No. SES-LIC-20130124-00089 (granted June 20, 2013).

operations via waiver should not limit or preclude new entrants. SpaceX urges the Commission to consider proposals by interested parties in the context of enhancing NGSO broadband satellite competition and ensuring that changes to the Part 25 rules, as well as processing of further NGSO broadband satellite market access requests, accommodate *bona fide* satellite service providers.

III. THE COMMISSION SHOULD ADOPT STREAMLINED ITU COORDINATION PROCEDURES FOR GSO AND NGSO NETWORKS

As the *FNPRM* recognizes, “[o]btaining international recognition in accordance with the International Telecommunication’s Union’s (ITU’s) regulations is generally a critical prerequisite for successful satellite network operation.”⁵ The *FNPRM* further acknowledges that the Commission’s existing ITU filing practice disadvantages U.S. filers because the Commission, unlike foreign administrations, will submit an Advanced Publication Information (API) filing or Coordination Request (CR) to the ITU only after a license application and cost-recovery acceptance have been filed with the Commission.⁶ SpaceX agrees with other satellite commenters that the Commission should adopt streamlined ITU coordination procedures for both GSO and NGSO system proponents and make other changes to strengthen its approach to ITU satellite network processing.

⁵ *FNPRM* at ¶ 6.

⁶ *Id.* at ¶ 7. As DIRECTV explains, this effectively requires potential licensees to apply to the Commission for authorization at specific frequency bands and orbital locations “before developments that could affect the availability of those frequencies at those locations have fully unfolded.” Comments of DIRECTV, LLC, *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, MB Docket No. 12-267, at 2-3 (Jan. 29, 2015).

A. The Commission Should Apply Streamlined ITU Coordination Procedure for Both NGSO and GSO Satellite Network Operators

The Satellite Industry Association (SIA) proposes that the Commission expand its proposal to permit advance ITU filings to NGSO space station operations.⁷ SpaceX agrees with SIA that U.S.-based satellite operators may prefer to operate as U.S. licensees but are often forced to seek ITU filing and coordination through foreign administrations given the current FCC regulatory environment, which often places U.S. networks at a disadvantage in the competitive international marketplace.⁸

At the same time, unique aspects of NGSO systems and the existing ITU satellite network processing rules create additional incentives for foreign administrations to pursue NGSO broadband satellite filing strategies that effectively block access to available spectrum and orbital resources.⁹ This, in turn, substantially undermines competition and innovation by significantly delaying or preventing *bona fide* NGSO broadband satellite system proponents from coordinating and ultimately deploying competitive systems.

Although enhancing U.S. participation in ITU satellite network filings on behalf of commercial providers may not have an immediate impact on abuse of the process by foreign administrations, reinvigorating the partnership with U.S. commercial interests would create a

⁷ Comments of The Satellite Industry Association, *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, at 3-4 (Jan. 29, 2015) (“SIA Comments”).

⁸ Comments of Intelsat, *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, IB Docket No. 12-267, at 20 (Jan. 29, 2015).

⁹ One recent, egregious example of this is a series of filings by the French administration that collectively seek access to all Ku-band and Ka-band satellite spectrum for a constellation of more than 500,000 satellites. This collection of “MCSAT” filings effectively preclude coordination and use of the band by subsequent filers, while being impossible to deploy or operate for numerous reasons.

strong advocate for reasonableness and regularity in the ITU satellite network filing process. As a result, SpaceX supports the extension of proposed changes to the Commission's ITU coordination procedures to NGSO systems to encourage such filings through the U.S. administration.

B. Submission of a Letter Request Should be Sufficient for Filing of ITU Materials

SpaceX agrees that the submission of a letter request for filing of ITU materials with a simplified description of the satellite network and a cost-recovery declaration should suffice to secure an international position that would provide a basis for a space station application at the Commission.¹⁰ Some commenters have noted that the UK's Ofcom, for example, has long used a "first-come, first-served" system that "permits confidential submission and assesses applications for basic technical due diligence" before coordinating with ITU.¹¹ And, although Ofcom had considered a shift to the U.S.-style system of requiring a full license application prior to coordination, it declined to do so because "the need to publish details of applications might deter applications to Ofcom."¹² Although this reasoning applies to both GSO and NGSO systems, the Commission currently only employs a first-come, first-served queue for GSO systems.

For NGSO systems, the Commission has retained a modified processing round approach, but has granted waivers where the proposed operations would not restrict the ability of new NGSO entrants to access the spectrum. In the case of such a waiver, filing of the aforementioned

¹⁰ See *FNPRM* at ¶ 15.

¹¹ Ofcom, *Procedures for Authorization of Satellite Networks*, 8, available at http://stakeholders.ofcom.org.uk/binaries/consultations/satellite_networks/summary/con_doc.pdf.

¹² *Id.*

letter request should be sufficient to secure an international position that would provide a basis for an NGSO satellite application at the Commission. Even if a waiver is not appropriate (*i.e.*, where grant of the application would adversely affect future NGSO access to the spectrum), the letter request would still provide a basis for the submission of a formal application in the processing round. In either case, using a letter request to facilitate submission of NGSO satellite network materials to the ITU enhances U.S. participation in the international coordination process by facilitating necessary filings in advance of a public NGSO satellite application or processing round.

C. Milestones and Bonds

SpaceX notes proposals to modify the Commission's milestone and bond requirements,¹³ but urges the Commission to maintain rules that deter speculative NGSO broadband satellite applications and create strong incentives for system implementation. Spectrum warehousing can be extremely detrimental and unprepared, highly speculative, or disingenuous applicants must be prevented from pursuing "paper satellites" (or "paper constellations"), which can unjustly obstruct and delay qualified applicants from deploying their systems. This is more than just a theoretical possibility as indicated by the recent ITU filings noted above. Thus, SpaceX strongly agrees with the Commission's two-pronged approach to deter spectrum warehousing: financial obligations and performance milestones.

SpaceX suggests, however, that the Commission consider adjusting its approach to milestones and bonds for NGSO broadband satellite constellations. In particular, applications for multiple NGSO satellite systems providing two-way broadband connectivity can greatly complicate the potential for sharing and lead to other undesirable results in the context of an

¹³ See SIA Comments at 4-6.

application processing round. Accordingly, SpaceX recommends that the Commission consider whether the following modifications to the NGSO broadband system implementation milestones might better serve the long-held policy goal of facilitating broadband innovation.¹⁴

Initial launch and operation. Instead of launching and operating a single satellite, SpaceX recommends the Commission consider a percentage of satellites proposed in the system. If a licensee is authorized for 10,000 satellites, the launch of a single satellite after three and a half years is not an indicator that the licensee can successfully deploy the other 9,999 satellites, or even a significant fraction thereof. SpaceX recommends that the NGSO system implementation requirements include a limited percentage of satellites (*e.g.*, 5 percent) within the time period specified for initial launch and operation of the system. We note, of course, that there are procedural mechanisms such as waivers for the Commission to address extraordinary circumstances such as launch failure.

Final system implementation. At the same time, for large NGSO broadband satellite systems, the Commission can afford licensees a measure of flexibility in the final system implementation milestone. Given their size and complexity, large NGSO broadband satellite systems can be designed for phased implementation and operational flexibility with variable coverage and capacity based on the deployment status of the network. Thus, large NGSO broadband satellite networks may be able to provide material commercial service even before all proposed satellites in the network are deployed.

Therefore, instead of requiring NGSO broadband satellite licensees to bring all authorized satellites into operation within six years following the license grant, SpaceX

¹⁴ SpaceX notes that its comments are directed at large NGSO broadband satellite systems rather than NGSO systems in other services (*e.g.*, EESS satellites operating primarily on the downlink), where the possibility of co-frequency sharing may be greater.

recommends changing the milestone to launch and operation of 75% of authorized satellites in that time period.¹⁵ Such a percentage-based approach reflects the flexibility that large NGSO systems enjoy in staged implementation and ultimate deployment configuration.

A seventy-five percent implementation benchmark for system implementation provides a useful margin for NGSO system operators while requiring material commercial service and deterring spectrum warehousing. The licensee could also seek to modify its license to reflect a smaller number of satellites if there is certainty that the additional satellite will not be deployed.

The foregoing initial and final system implementation milestones are intended to afford NGSO broadband satellite licensees flexibility similar to that afforded to Commission wireless licensees in the context of building out their licensed areas. For example, AWS-3 licensees must provide reliable signal coverage and offer service within 6 years from the date of the initial license to at least 40 percent of the population in each of its licensed areas (“Interim Buildout Requirement”),¹⁶ and must provide reliable signal coverage and offer service within 12 years from the date of the initial license to at least 75 percent of the population in each of its licensed areas (“Final Buildout Requirement”).¹⁷ As noted above, large NGSO broadband satellite systems will likely have sufficient operational flexibility to ensure material commercial service even before 100% of the proposed satellites are deployed, so flexible system implementation milestones are appropriate to enable NGSO licensees to continue system implementation efforts and, where necessary, modify their licenses to reflect final system architectures.

¹⁵ Thus, if a company is authorized to operate a constellation of 4,000 satellites and brings 3,000 satellites into operation within six years, the system is plainly credible and capable of material service provision.

¹⁶ See 47 C.F.R. § 27.14(s)(1).

¹⁷ See 47 C.F.R. § 27.14(s)(2).

Satellite contracting and construction. SpaceX also believes that the one-year, two-year and thirty-month satellite contract and design milestones for NGSO broadband satellite systems can be accelerated (shortened) by six months each. Such NGSO satellite systems are so large and complex, and the public interest in requiring system implementation are so compelling (*e.g.*, providing access to alternative broadband capacity, avoiding spectrum warehousing, etc.), that it is appropriate for the Commission to adopt expedited implementation milestones to ensure that *bona fide* NGSO broadband satellite systems are brought into operations as expeditiously as possible.

The Commission also requested comment on whether the “satellite construction contracting milestone and satellite construction milestone should be eliminated.” SpaceX believes that they should not be eliminated for NGSO broadband satellite systems, for two reasons. First, the contract milestone occurs early in the process and is a critical initial step to eliminate spectrum warehousing, and the construction milestones require continued progress towards system implementation. Second, these milestones help verify that a licensee continues to be “real” and is constructing its licensed satellites. If these early milestones were eliminated, additional market uncertainty would exist while the Commission and licensees wait years to determine if the initial and final system implementation milestones are satisfied.

Surety bonds. The Commission also asked whether the milestones should be optional and only used if the licensee wants to reduce the surety bond amount. SpaceX disagrees with the notion of “optional milestones” for NGSO broadband satellite systems. The purpose of the milestones, as stated above, is not just to have surety bond amounts available in the event of default, but to require actual technical progress from all Commission licensees. Thus, the bond

and milestone requirements go hand-in-hand to prevent speculative filings and encourage system implementation.

Finally, the Commission requested comment on whether its current surety bond amount is reasonable. For most NGSO systems, SpaceX agrees that \$5 million is a reasonable bond amount. However, for large NGSO broadband satellite systems (*e.g.*, greater than 100 satellites), the construction and launch costs are orders of magnitude greater and the bond value should be increased accordingly. SpaceX suggests that the Commission consider the following scaled bond amounts for large NGSO broadband satellite systems:

- \$5 million (1-99 satellites)
- \$10 million (100-999 satellites)
- An additional \$5 million for each additional 1,000 satellites

Such a scaled bond approach will help deter speculation and ensure that NGSO broadband satellite system proponents with the wherewithal to develop and deploy proposed systems move forward with system implementation. In addition, this approach would encourage more efficient NGSO broadband satellite system designs and deter unreasonably large NGSO system applications.

IV. CONCLUSION

In this proceeding, SpaceX urges the Commission to consider the expansion of both NGSO and GSO operations and to take into account new entrants and their planned operations as it modifies its rules. SpaceX strongly supports the Commission's proposal to adopt common sense changes to its rigorous Part 25 rules that will reduce regulatory burdens for satellite and earth station licensing, while at the same time enhancing the Commission's ability to participate in the international satellite coordination process on behalf of U.S. commercial interests and strengthening implementation requirements for new NGSO broadband satellite systems.

SpaceX is committed to introducing a new NGSO broadband satellite network in the United States, thereby enhancing competition and innovation for satellite services. Any adopted Part 25 streamlining rules should establish a level playing field for all operators, and encourage the expeditious deployment of new systems and services, to expand consumer choice in broadband connectivity.

Respectfully submitted,

**SPACE EXPLORATION TECHNOLOGIES
CORP.**

_____/s/_____

Timothy R. Hughes
Senior Vice President & General Counsel
SPACE EXPLORATION
TECHNOLOGIES CORP.
1030 15th Street, NW #400E
Washington, DC 20005

Monica S. Desai
Carlos M. Nalda
SQUIRE PATTON BOGGS (US) LLP
2550 M Street, NW
Washington, DC 20037

*Counsel for Space Exploration Technologies
Corp.*

March 2, 2015