REQUEST FOR EXTENSION OF SPECIAL TEMPORARY AUTHORITY

Space Exploration Holdings, LLC ("SpaceX"), pursuant to Section 25.120 of the Commission's rules, hereby requests extension of its existing Special Temporary Authority ("STA") for 180 days so that satellites launched and to be launched into its non-geostationary orbit ("NGSO") Starlink constellation can continue to communicate with earth stations operated by its sister company, SpaceX Services, Inc. ("SpaceX Services") during the orbit-raising and de-orbit phases and early operations of its satellites.[1] SpaceX has been authorized to launch and operate a constellation of 4,409 NGSO satellites (call sign S2983/S3018) using Ku- and Ka-band spectrum, and to date has launched 480 spacecraft. Pursuant to a series of STAs, these spacecraft have been communicating with earth stations operated by SpaceX Services for over a year, and SpaceX has received no complaints from any other authorized spectrum user. SpaceX anticipates a regular cadence of further launches throughout 2020 and 2021, which will require additional authorization for communications with these earth stations.

SpaceX's current STA will expire on or about July 4, 2020. Accordingly, SpaceX requests a 180-day extension of the STA to continue to operate in the same frequency bands to support three categories of operations for newly-launched satellites – communications with earth stations to conduct telemetry, tracking, and control ("TT&C") functions during orbit-raising (and, if necessary, de-orbit) and on-orbit operations; communications with six Ku-band earth stations to test the communications payload on each of its satellites; and communications with five Ka-band gateway earth stations to test the communications payload on each of its satellites.[2]

In addition, to further enhance the many levels of safety built into its operational procedures, SpaceX has recently begun inserting its satellites at a very low orbital altitude – approximately 280 km. At that altitude, even in the unlikely event of an immediate satellite failure, spacecraft can be expected to demise in the atmosphere within a matter of weeks and thereby quickly remove any danger they could pose as orbital debris. However, SpaceX has found that acquiring all 60 satellites in a launch package upon initial insertion is very challenging, and failure to establish contact quickly can mean that a healthy satellite will reenter the atmosphere and be lost.

Accordingly, SpaceX requests that the STA extension authorize its satellites to transmit TT&C signals in the 12.15-12.25 GHz band at a slightly higher power level so that they are easier to acquire after insertion. At present, SpaceX satellites transmit TT&C signals at 14 dBm upon orbital insertion at 280 km altitude. SpaceX proposes to boost the power to 23 dBm under the following circumstances. In this regard, it is important to note that all SpaceX satellites are programmed not to transmit until they have been contacted by an earth station. For the first 24 hours after insertion, the satellites would be programmed to respond at the current nominal power level. If they have not established a link within that timeframe, they will then respond at the higher power level if contacted within the next 48 hours. At the end of this 72-hour cycle, the satellites

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1 *See* Stamp Grant, IBFS File No. SAT-STA-20191230-00156 (Mar. 19, 2020).

2 The call signs for these earth stations are E190129, E190130, E190131, E190161, E190162, E190163, E190164, E190648, E190649, E190676, E190724, and E190725.

will reboot and repeat the 24/48 hour power cycle. At any point in this process after the satellites establish contact with SpaceX's TT&C earth station, they will quickly revert to their authorized (lower) power levels.

SpaceX estimates that in the large majority of cases its satellites will need to transmit for approximately five seconds at the higher power level before reducing back to the currently authorized level. That should be sufficient to downlink trajectory information so that SpaceX's TT&C ground station can track the spacecraft and maintain contact. In a small number of cases, it is possible that the satellite may be unable to close the link for the full five second period, and thus will continue to transmit bursts of trajectory information until it is either successful or passes out of the TT&C earth station's view.

The Commission has good cause to grant the requested extension. As with the STAs granted over the last year, granting this extension request would enhance the safety of space by authorizing TT&C functions that are essential to commanding the spacecraft and ensuring the health and safety of SpaceX's nascent constellation, while also allowing SpaceX to confirm the operational status of its satellites immediately upon insertion. By continuing testing even after the satellites have reached their intended orbits, SpaceX will ensure ongoing capabilities and be better able to prepare for accelerated launch of service. Accordingly, extending the STA will serve the public interest.

As with its current STA, SpaceX will continue to operate on a non-interference basis. Consistent with its authorization, SpaceX will during almost all operations observe the applicable equivalent power flux-density ("EPFD") limits set forth in Article 22 and Resolution 76 of the ITU Radio Regulations and the applicable power flux-density ("PFD") limits set forth in the Commission's rules and Article 21 of the ITU Radio Regulations, which the Commission has found sufficient to protect GSO systems and terrestrial systems, respectively, against harmful interference. SpaceX recognizes that the higher power TT&C transmissions will likely exceed the applicable PFD limits; however, given the short duration, small bandwidth, and highly intermittent nature of these transmissions, it is unlikely that they would cause any interference to other licensed users of the band, and the Commission should waive those limits to the extent necessary. Moreover, in the extremely unlikely event that harmful interference should occur due to transmissions to or from its spacecraft, SpaceX will take all reasonable steps to eliminate the interference. Should an issue arise, SpaceX can be reached at satellite-operators-pager@spacex.com, which links to the pagers of appropriate technical personnel 24/7.

Accordingly, SpaceX requests that the Commission extend the STA for its Starlink space stations for an additional 180 days.