



KEPLER COMMUNICATIONS INC.

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VIA ELECTRONIC FILING

October 15, 2019

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Washington D.C. 20554

**Re. Space Exploration Holdings, LLC, IBFS File Nos. SAT-LOA-20161115-00118,
SAT-MOD-20181108-00083, SAT-MOD-20190830-00087 and SAT-STA-20190924-
00098;**

**Kepler Communications Inc., IBFS File No. SAT-PDR-20161115-00114;
WorldVu Satellites Limited, IBFS File No. SAT-LOI-20160428-00041;
Telesat Canada, IBFS File No. SAT-PDR-20161115-00108**

Dear Ms. Dortch:

Kepler Communications Inc. (Kepler) hereby submits this letter in association with several concerns regarding the NGSO system authorized to Space Exploration Holdings LLC (SpaceX). First, Kepler hereby submits a Petition to Reconsider the Order and Authorization (Order)¹ issued by the Federal Communications Commission (Commission) of SpaceX's request to lower the altitude of 1,584 of its satellites to 550 km (First SpaceX Modification).² The Order did not adequately address the concerns of commenters regarding the new orbital debris risk posed by the First SpaceX Modification. Its overall assessment was self-limited due to the application of the 'zero collision risk' assumption, commonly applied to systems capable of propulsive

¹ See Space Exploration Holdings, LLC, DA 19-342 (rel. Apr. 26, 2019) ("Order").

² See Space Exploration Holdings, LLC, *Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, IBFS File No. SAT-MOD-20181108-00083 (Nov. 8, 2019).

maneuvering.³ Recently, several apparent on-orbit failures of SpaceX’s first tranche of satellites call into question the reasonable applicability of this assumption to the SpaceX modification. In fact, concerns regarding the reliability of SpaceX’s rapidly developed Starlink satellites were raised by commenters early on.⁴ Not only did the Commission fail to account for this, but the assessment that it did perform did not account for worst-case scenarios. It also did not address commenters concerns regarding potential service capacity loss (and therefore interference) that would result from the execution of new avoidance maneuvers to avoid the SpaceX constellation. Second, this reconsideration would render moot SpaceX’s more recent modification request to increase the number of orbital planes at the 550 km altitude range from 24 to 72 (Second SpaceX Modification).⁵ Therefore, Kepler consequently Petitions to Defer or Deny this second modification. Third, Kepler Petitions to Defer or Deny SpaceX’s recent request for Special Temporary Authority (STA) to launch its second tranche of satellites into the new orbital configuration specified by its Second Modification before the end of October.⁶ The Commission should address the Petitions to Reconsider of both Kepler and WorldVu Satellites Limited (OneWeb) filed in relation to the First SpaceX Modification before any action is taken on both the Second SpaceX Modification and the request for STA to launch SpaceX’s second tranche of

³ Commission rules require that systems provide an assessment of the probability of a satellite becoming a source of debris as a result of large object collision. *See* 47 CFR § 25.114(d)(14)(iii). Current Commission practice considers systems capable of propulsive maneuvering to have a zero or near-zero risk.

⁴ *See* WorldVu Satellites Limited, *Petition to Deny or Defer of WorldVu Satellites Limited*, IBFS File No. SAT-MOD-20181108-00083 (Feb. 8, 2019) (“OneWeb Petition”) at 13.

⁵ *See* Space Exploration Holdings, LLC, *Application for Modification of Authorization for the SpaceX NGSO Satellite System*, IBFS File No. SAT-MOD-20190830-00087 (Aug. 30, 2019).

⁶ *See* Space Exploration Holdings, LLC, *Request for Special Temporary Authority*, IBFS File No. SAT-STA-20190924-00098 (Sep. 24, 2019).



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satellites. Fourth, Kepler maintains its position that its system was the first to meet the home spectrum selection criteria under 47 C.F.R. §25.261.



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PETITION TO RECONSIDER SPACEX'S FIRST MODIFICATION

The Commission's rules specify that a space station modification will be granted except under certain circumstances,⁷ including if the grant "would not serve the public interest, convenience, and necessity". The Order conceded that "[i]f a modification would worsen the interference environment, that would be a strong indication that grant of the modification would not be in the public interest". Kepler, OneWeb, and SES/O3b all provided substantial criticism of SpaceX's interference analyses.⁸ The Commission later concluded upon review that the modification "does not present significant interference problems and is in the public interest".⁹ This review inadequately addressed commenters' interference concerns, especially with respect to physical debris risk. Therefore, Kepler hereby submits this Petition to Reconsider the Order and asks that the Commission's properly reassess the risks associated with its grant of SpaceX's First Modification.

The Order did not address commenters' interference concerns

Kepler is among a number of operators that petitioned to deny or defer the Modification for concerns related to physical coordination and frequency interference.¹⁰ Kepler and others noted

⁷ See 47 C.F.R §25.117(d)(2).

⁸ See Kepler Communications Inc., *Conditional Petition to Deny* (Jan. 29, 2019); OneWeb Petition; SES/O3b Limited, *Comments of SES/O3b Limited* (Feb. 2, 2019) ("Kepler Petition"); EchoStar Satellite Operating Corp., Hughes Network Systems, LLC, and Intelsat, *Reply of EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC, and Intelsat License LLC* (Mar. 5, 2019); Commercial Smallsat Spectrum Management Association, *Comments and Petition to Defer* (Jan. 29, 2019) ("CSSMA Petition") on loss of service capacity due to greater frequency of avoidance maneuvers. All comments were filed under IBFS File No. SAT-MOD-20181108-0008.

⁹ See Order at ¶ 11.

¹⁰ See IBFS File No. SAT-MOD-20181108-0008. Six operators and one satellite trade association filed petitions of the SpaceX Modification. Three other operators also filed joint comments that were critical of the modification (EchoStar, Hughes, and Intelsat).

that the increased level of conjunctions inevitably caused by the new SpaceX constellation could notably interrupt their delivery of service (due to the fact that their satellites cannot perform an avoidance maneuver and provide service simultaneously).¹¹ Unless SpaceX assumes the responsibility of all avoidance maneuvers, it is evident that this effect would directly “worsen the interference environment” for existing operators. The Commission did not address this concern. If SpaceX’s modification was granted on the premise that its propulsion reduces its collision risk to zero, then the burden of collision avoidance fundamentally lies on shoulders of those propulsive capabilities. Upon reconsideration of the Order, the Commission must therefore impose a requirement on SpaceX to assume the burden of all avoidance maneuvers made as a result of its Modification.

Kepler notes its use of non-propulsive satellites and the design of its constellation as a whole did not need to consider a substantial execution of avoidance maneuvers. Given the change introduced by SpaceX, and absent any further conditions on its authorization, Kepler would need to fundamentally alter its constellation design just to meet the goals stated in its own authorization. To account for the new interference, Kepler would be forced to consider either increasing the size of its constellation or outfitting its satellites with propulsive capabilities. Both modifications would require Kepler to incur significant financial and operational cost simply to accommodate SpaceX’s proposed operations.

The Order did not address commenters’ debris concerns

¹¹ See Kepler Petition at 5; CSSMA Comments at 4 - 5.

In its modification, SpaceX provided a list of factors that would act to benefit its overall orbital debris mitigation profile.¹² However, the points raised did not on their own constitute an ‘analysis’ to the extent necessary to address the reasonable concerns of other operators. The comments of Kepler, Planet, Astro Digital, Spire, OneWeb, and the CSSMA all highlighted SpaceX’s failure to address the effects of its modification on the LEO environment.¹³ As the CSSMA highlighted, SpaceX’s introduction of 1,584 satellites would effectively triple the number of tracked satellites operating in the 400 – 600 km range.¹⁴ The CSSMA also pointed out flaws in several of SpaceX’s listed factors, demonstrating that they were either ineffectual or invalid.¹⁵ Instead of answering these concerns, SpaceX dismissed most of the them outright and wholly ignored other parts altogether.¹⁶ Kepler began physical coordination discussions with SpaceX following the grant of the modification, but SpaceX has since stopped replying to Kepler’s follow-up correspondence.

Under the Commission’s current rules, satellites that are capable of active maneuvering (i.e. are equipped with propulsion) are considered to have a collision risk with large objects of zero, given that these spacecraft also meet a certain failure rate threshold. SpaceX relied on this very assumption to meet the requirement to assess its orbital debris risk.¹⁷ Kepler does not dispute that under nominal circumstances, SpaceX would indeed qualify for this assumption. However, SpaceX’s 2019 Annual Report (filed on July 1, 2019) indicated that its first tranche of satellites

¹² See First SpaceX Modification, *Technical Information to Supplement Schedule S*, at A.11.

¹³ See *supra* at note 10. See also CSSMA Petition, Technical Annex A-D.

¹⁴ See CSSMA Petition at 4.

¹⁵ See *Id.* at Technical Annex A-D.

¹⁶ See SpaceX, *Consolidated Opposition to Petitions and Response to Comments of Space Exploration Holdings, LLC*, IBFS File No. SAT-MOD-20181108-00083 (Feb. 11, 2019).

¹⁷ See 47 CFR § 25.114(d)(14)(iii). See also *supra* at note 12.

launched in May had already experienced a number of critical failures.¹⁸ SpaceX reported that 3 of its 60 satellites had experienced a total loss of communication (5%), and that 10 more had not yet completed their expected orbit raise procedures. SpaceX has since filed *three separate times* to extend its special temporary authority for carrying out these orbit raising procedures.¹⁹ Each of its STA filings state that SpaceX's orbit raising authority must continue because "there are still some satellites that have yet to reach their authorized altitude". Current Starlink TLEs indicate that at least six satellites are presently not in their nominal orbits (excluding two to account for those that SpaceX has stated are being deorbited intentionally). Of these six, four satellites remain at an appreciable distance (>10 km) from their target positions.²⁰ Therefore, at least 7 of 60 satellites (11.6%) appear to have experienced some kind of failure that affects their maneuverability. In order to verify the actual potential for conjunctions, Kepler requests that SpaceX clarify for the record how many satellites have had any issues, propulsive or otherwise. Furthermore, the Commission should require SpaceX to report, prior to launch, the number of satellites whose deployment plans will deviate from those described in SpaceX's authorization, and the nature of those deviations. Considering that the zero-risk assumption is predicated on the capability of satellite system to maneuver, Kepler questions whether SpaceX's use of the zero-risk assumption remains valid at its present failure rate. To put this into perspective, 11.6% of SpaceX's full 1,584 satellite deployment would represent 184 defunct objects – more than Kepler's entire authorized

¹⁸ See Space Exploration Holdings, LLC, *Annual Report*, IBFS File No. SAT-LOA-20161115-00118 (July 1, 2019).

¹⁹ See Space Exploration Holdings, LLC, *Request for Extension of Special Temporary Authority*, IBFS File Nos. SAT-STA-20190717-00063 (Jul. 7, 2019), SAT-STA-20190815-00075 (Aug. 8, 2019), SAT-STA-20190917-00095 (Sep. 17, 2019).

²⁰ See Space-Track satellite catalog at <https://www.space-track.org>.

constellation.²¹ The debris risk is further amplified by the greater cross-sectional area and mass of SpaceX’s satellites. Given that a significant portion of SpaceX’s first tranche of satellites appear to have experienced issues that affect its ability to maneuver, the Commission’s application of the ‘zero’ collision risk assumption may, in this case, have served to harm the public interest.

The recent Orbital Debris NPRM noted that “[a] design or reliability flaw resulting in malfunction of spacecraft during deployment or mission operations could result in a significant number of non-functional spacecraft in an operational orbit, contributing to the orbital debris population”.²² Unfortunately, this appears to be precisely what has happened. Arguably more troubling is that this could have been avoided if the Commission had appropriately heeded commenters pleadings. OneWeb issued an array of such warnings in its Petition, highlighting that SpaceX’s “rapid iteration philosophy” and “test and discard” approach to its engineering is simply too reckless to be employed in the delicate LEO orbit.²³ OneWeb therefore asked the Commission to “ensure [SpaceX’s] first-generation spacecraft satisfy appropriate and verifiable reliability standards”²⁴, stressing the importance to “inquire as to the design heritage and expected reliability of SEH’s first-generation spacecraft to determine the continued validity of its prior concerns about the reliability issues presented by SEH’s constellation”.²⁵ OneWeb concludes its thought by reminding the reader that because SpaceX is “the proposed operator of the largest NGSO constellation by an order of magnitude, [it] cannot be allowed to avoid potentially serious

²¹ If placed in orbit today, such a group would represent the largest constellation by both mass and number (surpassing even Planet, which has the greatest number of satellites presently in orbit at 140). See Planet, *Planet FAQ*, at <https://www.planet.com/faqs/> (accessed Oct. 15, 2019).

²² See *Mitigation of Orbital Debris in the New Space Age*, Notice of Proposed Rulemaking, FCC 18-159 (rel. Nov. 19, 2018) (“Orbital NPRM”) at ¶ 42.

²³ See OneWeb Petition at 15.

²⁴ See *Id.* at 13.

²⁵ See *Id.* at 19.

reliability issues by simply relocating to an altitude that offers greater de-orbit redundancies”.²⁶

Stakeholders predictions have become fact, with SpaceX generating significantly more debris with a single launch than can be considered acceptable. Its continued operations without proving the reliability of its systems is fundamentally inconsistent with U.S. leadership in space and basic principles of orbital stewardship.

The Commission itself did solicit some additional information from SpaceX, requesting that they “provide an estimate of the collision risk [...] for a single satellite, assuming a propulsion or other system failure that renders the satellite incapable of collision avoidance immediately following orbital injection”.²⁷ The Order considered this scenario – one where “failure occurs immediately after launch of the satellite” – to be “worst-case”.²⁸ This statement represents a serious assessment error. Collision risk is in fact proportional to orbital lifetime and local density of Resident Space Objects, both of which are far lower at SpaceX’s injection altitude. Moreover, SpaceX did not even use its actual injection altitude of 440 km, but instead ran its risk assessment at the much lower altitude of 350 km.²⁹ To obtain a correct worst-case scenario, SpaceX should run its risk assessment at its highest expected altitude (550 km in this case). In light of the difficulties of SpaceX’s initial tranche, the Commission should also require SpaceX to evaluate the risk of its constellation using its *observed failure rate*. That is, SpaceX should provide an

²⁶ See *Id.* at 19 – 20.

²⁷ See *Commission Request*, IBFS File No. SAT-LOA-20161115-00118 (Feb. 26, 2019). The Commission concluded that the information provided by SpaceX was sufficient to meet its assessment requirements.

²⁸ See Order at ¶ 22. See also SpaceX Letter, *Response to FCC Information Request*, IBFS File No. SAT-MOD-20181108-00083 (Mar. 13, 2019).

²⁹ The only verifiable technical information available on the presently orbiting Starlink satellites was given in a SpaceX press kit for their launch. URL: https://www.spacex.com/sites/spacex/files/starlink_press_kit.pdf.

estimate of the collision risk using NASA's Debris Assessment Software for a constellation of 184 defunct Starlink satellites at 550 km in their fully deployed configurations.

The presence of SpaceX's constellation significantly impacts the orbital debris environment

Because Kepler's system is not equipped with propulsion, Commission rules required that it submit a comprehensive Orbital Debris Assessment Report (ODAR) as a condition of its application for market access.³⁰ This ODAR assessed the combined orbital debris risk of Kepler's full constellation of 140 CubeSat satellites.³¹ Kepler has undertaken a basic assessment to estimate the impact of the 1,584 Starlink satellites on its own orbital debris risk profile. Using NASA's Orbital Debris Assessment Software and the techniques described in NASA's Orbital Debris Engineering Model 2000, it found that the introduction of these satellites to the 550 km region caused its probability of collision with large objects to increase by a factor of 3.01x, inevitably placing Kepler aggregate risk above the required threshold of 0.001. In fact, Kepler's analysis against the SpaceX constellation alone (excluding all other debris) still exceeded the threshold. This finding at the very least hints at the scale of the impact SpaceX's constellation will have on the LEO environment if permitted to deploy. The current orbital debris rules were never designed to account for modifications that could have a material impact on large-scale orbital debris

³⁰ See Letter from Kepler Communications Inc., *Kepler Orbital Debris Assessment Report (ODAR) For MULTUS Filing*, IBFS File No. SAT-PDR-20161115-00114 (Aug. 1, 2017). Kepler has since filed an update to this ODAR. See *infra* at note 36.

³¹ The original ODAR assumed the use of a 3U CubeSat platform. Kepler later submitted a revised analysis to the Commission to account for its planned expansion to a 6U CubeSat platform. See *infra* at note 36. Despite being submitted on September 21, 2018, the Commission has yet to provide a decision on this matter. Kepler's third satellite is a 6U platform, and will be unable to provide its service in the US until such Commission action is taken. Kepler openly asks why SpaceX's modifications, which are both more extensive and were submitted later, have been processed and granted in the intervening time.

statistics. This is a prime example of how SpaceX's reckless ambition strains the existing regulatory framework, and the fair use of space. The Commission should treat its extraordinary nature appropriately and require that SpaceX provide these analyses in lieu of the zero-collision risk assumption. The Commission should act on this matter before granting any further permission to launch new tranches of satellites to 550 km.

SpaceX has not provided clarification on the change of its bus size/mass

The launch of SpaceX's first tranche of satellites saw a deployment of systems that deviate substantially from the characteristics described in SpaceX's authorizations to date.³² The public record does not reflect the completion of an updated ODAR that incorporates these changes. The Commission should require SpaceX to provide clarification on the change of its bus size/mass, such that the risk of their system can be properly assessed. Further, SpaceX must be transparent in its reporting of all the challenges its satellites have experienced since launch, especially with regards to propulsion systems. This information impacts the collision risk assessments of all systems operating in the subject LEO environment.

³² SpaceX's authorizations for its original constellation and its experimental Microsat system specified satellites with an average area/mass ratio of 0.0400 m²/kg (calculated using a mass of 386 kg and a cross-sectional area that incorporates two solar panels) and an orbital lifetime calculated with respect to their old altitude at 1,150 km. The satellites that SpaceX recently placed into orbit at 550 km were not accompanied with an updated ODAR. The only publicly available information on these satellites is a press kit that was released for the launch of the initial tranche, which stated that the real systems have a significantly different mass (227 kg) and solar panel configuration. See Space Exploration Holdings, LLC, *Application for Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*, IBFS File Nos. SAT-LOA-20161115-00118, SAT-LOA-20170726-00110, 33 FCC Rcd 3391 (2018). See Microsats 2a and 2b, ELS File No. 0298-EX-CN-2016.

Waiver of requirement to file petition for reconsideration within 30 days of final**Commission action: §1.106(f)**

In light of the notable challenges of SpaceX's rushed deployment, the Commission should review their assessment of SpaceX's orbital debris risk and reconsider the grant of its Modification. The Commission must perform a proper review, taking into account the rate of failures observed in SpaceX's system to date. Considering the timeliness of these events, Kepler hereby requests a waiver of 47 CFR § 1.106(f) to allow that this Petition be filed after the 30-day period following the publication of the Order. Considering the performance of SpaceX's satellites, and for all the reasons discussed in this Petition, the greater public interest fundamentally hinges on SpaceX's demonstration that its system will not threaten the health of LEO. The Commission must take this opportunity to both perform a full analysis of the modified SpaceX system and correct the flaws it made in its original assessment.

PETITION TO DEFER OR DENY SPACEX'S SECOND MODIFICATION

No action should be taken on SpaceX's Second Modification until all petitions to reconsider SpaceX's First Modification have been addressed. Furthermore, Kepler is unaware of any ITU filing submitted by SpaceX that reflects the changes requested by its Second Modification. Kepler notes however that SpaceX has recently submitted 20 separate ITU filings that together describe an unprecedented deployment of 30,000 new satellites to the sub-600 km LEO environment.³³ The collision risks of such a constellation would be obviously untenable and such filings in no way support SpaceX's claim of striving for good faith coordination. As OneWeb highlighted in its Petition, the fail-fast fail-often philosophy employed by SpaceX will, at the going rate, destroy the viability of Low Earth Orbit.³⁴ Kepler urges the Commission to consider these facts in this assessment of yet another SpaceX modification.

It seems germane to stress that in addition to the First Modification, the Commission should carefully assess this one as well. SpaceX states that its proposed increase of orbital planes "will have no impact on the orbital debris mitigation characteristics of the Starlink constellation".³⁵ This is not necessarily true, as an increase in total number of orbital planes could also increase the rate SpaceX's intra-constellation conjunctions. Before the Commission rules on this Modification, it should strive to understand these, and any other potential consequences, in sufficient detail to assuage reasonable public concern.

³³ See ITU Space Network List, *Information "as received" (Part-C)* at <https://www.itu.int/ITU-R/space/asreceived/Publication/AsReceived> (accessed Oct. 13, 2019). The filings include USASAT-NGSO-3W-2, -3W-1, -3V-2, -3V-1, -3U-2, -3U-1, -3T-3, -3T-2, -3T-1, -3S-3, -3S-2, -3S-1, -3R-3, -3R-2, -3R-1, -3Q, -3P, -3O, -3M and -3N.

³⁴ See OneWeb Petition at 14 – 15. OneWeb discusses how SpaceX's "rapid innovation" approach "may not be as well suited to the crowded LEO operating environment where spacecraft can linger for years".

³⁵ See Second SpaceX Modification at 5.

Kepler also asks the Commission to address its received requests in appropriate order. For example, Kepler filed several *ex parte* notices with the Commission in 2018 to provide additional clarity on the next phase of its constellation.³⁶ These came complete with an updated ODAR, and Kepler's next satellite to be launched will utilize the architecture described therein. The Commission has yet to update Kepler's authorization with a ruling on this change, despite being relatively simplistic and having been submitted over a year ago.

³⁶ See Letter from Nickolas G. Spina to Marlene H. Dortch, IBFS File No. SAT-PDR-20161115-00114 (Sep. 21, 2018); Kepler Communications Inc., *Constellation Collision Risk*, IBFS File No. SAT-PDR-20161115-00114 (Sep. 21, 2018).

**PETITION TO DEFER OR DENY SPACEX'S REQUEST FOR SPECIAL TEMPORARY
AUTHORITY TO LAUNCH ITS SECOND TRANCHE OF SATELLITES**

Kepler wishes to acknowledge SpaceX's consistent and admirable efforts towards maintaining the timeliness of their missions. However, its recent application for STA appears to be an attempt to skip the same regulatory processing queue through which all other operators must pass through.³⁷ A grant of the requested STA would be inappropriate not only because it would side-step the Commission's review process for SpaceX's Second Modification, but because the core justification for the request does not meet the basic requirements stipulated by the Commission's rules. Section §25.120(b)(1) states that an STA may only be granted "upon a finding that there are extraordinary circumstances requiring temporary operations in the public interest and that delay in the institution of these temporary operations would seriously prejudice the public interest. Convenience to the applicant, such as marketing considerations or meeting scheduled customer in-service dates, will not be deemed sufficient for this purpose". However, SpaceX seeks immediate launch authorization of its second tranche of satellites for no reason other than to meet its own internally chosen launch date at the end of October.

Further, this second STA request is particularly unique because of its demand for a ruling prior to the date that the public commenting period will close on the Second SpaceX Modification. In this way, a grant would enable SpaceX to orbit a set of *new satellites* into a *new configuration* before the public has fully had the chance to comment on any of its proposed changes. Such an

³⁷ See *supra* at note 6.



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action would plainly act against the public interest and allow SpaceX to effectively act as its own *de facto* regulator.

KEPLER RETAINS FIRST CLAIM TO HOME SPECTRUM

Kepler emphasizes that its preferred future is one where effective and practicable coordination agreements can be reached with all its co-frequency peers in the Ku-band. Recent letters by SpaceX and the NRAO have not provided new information that meaningfully challenges Kepler's claim to first selection of home spectrum.³⁸ Further, Kepler notes that dialog with the NSF (in its capacity to represent the NRAO) has concluded that there are no immediate coordination concerns.

³⁸ See NRAO, *Comments of the National Radio Astronomy Observatory*, IBFS File No. SAT-LOI-20160428-00041 (Aug. 2, 2019); Letter from David Goldman, Director of Satellite Policy, Space Exploration Technologies Corp. to Marlene H. Dortch, IBFS File Nos. SAT-LOA-20161115-00118, SAT-MOD-20181108-00083 (Sep. 27, 2019).

CONCLUSION

SpaceX has continued to inundate the regulatory pipeline with its frequent and underdeveloped requests for major modifications. SpaceX's citation of the Commission's practice of treating propulsion-equipped systems as having a large-object collision risk of zero has allowed it to evade the essential work of proving the safety of its system. Although the general validity of this assumption is being re-evaluated within the Commission's ongoing review of its orbital debris rules,³⁹ SpaceX's recent launch of its first tranche of satellites indicates that the health of its propulsive systems has fallen short of reasonable expectations of reliability. The Commission should reconsider its grant of SpaceX's First Modification and ensure that all orbital and interference concerns were properly and adequately accounted for. Further, as many commenters requested, the Commission should require SpaceX to submit a comprehensive collision risk analysis as a condition to the further continuation of their orbital deployments to 550 km. SpaceX's subsequent modifications should not be considered until these concerns have been addressed. It is imperative that the Commission, the processing round entrants, and the public are adequately informed of the precise impact SpaceX's rushed movement to LEO will have on the orbital debris environment. For these reasons, Kepler asks that the Commission take the actions described herein.

Sincerely,

/s/ Nickolas G. Spina

Nickolas G. Spina
Director, Launch and Regulatory Affairs
Kepler Communications Inc.

³⁹ See Orbital NPRM.



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cc: Jose Albuquerque, Chief, Satellite Division
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CERTIFICATE OF SERVICE

I, Nickolas Spina, hereby certify that on October 15, 2019, a true and correct copy of this document was sent via Canada Post, first class postage prepaid, to the following:

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