

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

Application of	)	
	)	
<b>VIASAT, INC.</b>	)	Call Sign: S2985
	)	
For Modification of the Viasat	)	File No. SAT-MPL-20200526-00056
Non-Geostationary Orbit Satellite System	)	
Using Ka- and V-Band Frequencies	)	
	)	

**REPLY OF SPACE EXPLORATION HOLDINGS, LLC**

**SUMMARY**

In its Petition to Deny or Defer Viasat’s modification request, SpaceX observed Viasat’s strategy of distracting from flaws in its application by lashing out at its competitors. SpaceX recommended that the Commission “apply extra scrutiny to issues where Viasat resorts to *ad hominem* attacks or finger-pointing.”<sup>1</sup> This heuristic offers a reliable roadmap for analyzing Viasat’s filing and cutting through its bluster. On each point where Viasat uses the most heated rhetoric, it does so to distract from a critical Viasat flaw or concession.

With regard to the significant increase in interference its modification will cause, Viasat resorts to irrelevant and inaccurate criticism of other non-geostationary orbit (“NGSO”) satellite systems and other distractions as opposed to presenting a responsive technical analysis. Viasat repeatedly criticizes aspects of SpaceX’s modification requests<sup>2</sup> and condemns as “simplistic”

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<sup>1</sup> Petition to Deny or Defer of Space Exploration Holdings, LLC, IBFS File No. SAT-MPL-20200526-00056 at iv (filed Aug. 30, 2020) (“SpaceX Petition”).

<sup>2</sup> *See, e.g.*, Consolidated Opposition to Petitions and Response to Comments of Viasat, Inc., IBFS File No. SAT-MPL-20200526-00056 at 14 (filed Sep. 15, 2020) (“Viasat Opposition”).

SpaceX's and O3b's obviously correct assertions that Viasat's proposal to dramatically increase the number of satellites in its NGSO system will cause more potential in-line events with other NGSO operators.<sup>3</sup> Yet, despite Viasat's vehement rhetoric, its only substantive response to such concerns is to concede that its own interference analyses rely on Viasat's vaguely articulated capabilities to "manage" its system and "ensure" that somehow it will not create significant increases in in-line interference events.<sup>4</sup>

As Viasat is surely aware, its promises to avoid increases in the number of cases where band-splitting is the default remedy are of no use to other operators considering Viasat refuses to give other operators the necessary information to predict which band-splitting events Viasat will use its various "tools" to avoid, and which it will allow to occur.<sup>5</sup> Thus, Viasat's response merely confirms that the Commission should defer Viasat's application to a subsequent processing round. The Commission's rules demand it, in fact.

Rather than reliance on vague promises, deferral is the mechanism that the Commission's precedent contemplates to ensure that an applicant whose proposal would otherwise degrade the interference environment will be required to do what is necessary to promote certainty for other operators by taking responsibility for interference protection. Failing that, the Commission should condition Viasat's license on achieving one of three options prior to commencing operations: (1) reaching coordination agreements with other first-round NGSO licensees, (2) seeking and obtaining a further modification with more detail on how it will protect those licensees against increased interference, or (3) agreeing to assume the obligation to avoid all band-splitting events

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<sup>3</sup> Viasat Opposition at 28-29

<sup>4</sup> See, e.g., *id.* at 29 ("Viasat has a number of tools available to *manage the operation* of its modified NGSO FSS system *and ensure* that it does not exceed the interference profile of its pre-modified system with respect to other same-round NGSO FSS systems." (emphasis in original)).

<sup>5</sup> *Id.* at 57.

with other first-round operators. Such a condition would ensure that the interference environment remains stable and predictable for existing licensees even in the absence of actionable information from Viasat about its interference mitigation plans.

Just as troubling is Viasat's attempt to point fingers at others as a way to distract from the massive risk its modified system would pose to the orbital environment. Viasat makes the absurd claim that, even though SpaceX is a launch provider transporting high-value satellites, cargo, and, most critically, America's astronauts into space, SpaceX "lacks credibility" on orbital debris issues. Ironically, it bases these allegations about credibility on its own documented misrepresentations of available data.<sup>6</sup> Yet, once again, once Viasat's attempts at irrelevant distractions are stripped away, it becomes clear that Viasat actually concedes the core of SpaceX's orbital debris argument: Viasat's collision-risk analysis simply *assumes* that its satellites will reliably reach their passive disposal orbits, rather than including the risk of satellite failure at operational altitudes in its collision analysis.<sup>7</sup>

This omission conceals the risk that a number of Viasat satellites will likely be stranded at their operational altitudes, and therefore remain potential sources of hazardous debris for hundreds or thousands of years. Once these stranded satellites are correctly accounted for, the total collision risk presented by Viasat's modified system is far greater than Viasat has claimed, and well above the collision-risk limit Viasat proposes to impose on others. Viasat's own filing is therefore decisive evidence that the per-constellation collision-risk metric Viasat has advanced for application to U.S.-licensed systems is unworkable. The only way Viasat itself is able to claim

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<sup>6</sup> See Letter from Jonathan McDowell to FCC, IBFS File No. SAT-MPL-20200526-00056 (Sep. 21, 2020) (explaining that Viasat's presentation of data is "a misreading of my results") ("McDowell Letter").

<sup>7</sup> Viasat Opposition at 4.

compliance with this metric—even for satellites that Viasat concedes are purely notional<sup>8</sup>—is by omitting information, assuming away major risks, and then attacking anyone with the temerity to bring these issues to the Commission’s attention.

Despite these clear harms arising from the modification, Viasat denies any obligation to make a public interest showing in support of its application.<sup>9</sup> As a result, Viasat provides at best a token explanation of how the proposed system offers any benefits to the public superior to the system it is currently authorized to deploy.<sup>10</sup> This omission in the docket may be explained by the statements made by Viasat’s CEO in Viasat’s earnings call announcing the modification. He did not claim that the proposed modification will create any new benefits to the public. Instead, he admitted that the “biggest factor in wanting to go over the altitude is really the amount of funding that the FCC is aiming at low specifications.”<sup>11</sup> Yet Viasat has recently called into question whether a satellite system operating at less than half the orbital altitude of Viasat’s proposed modified satellites would be able to meet the “low specifications” established for the upcoming Rural Development Opportunity Fund auction, calling into question even its own self-

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<sup>8</sup> *See, e.g., id.* at 45 (“Viasat supports the Commission’s providing clear guidance on the importance of satellite reliability and space safety and *will design* its LEO system accordingly.” (emphasis added)), 52 (“Viasat *will design* its satellite with sufficient shielding and redundancy to meet that requirement and will provide the appropriate analysis to the Commission *when the design matures.*” (emphasis added)).

<sup>9</sup> *See, e.g.,* Application, IBFS File No. SAT-MPL-20200526-00056, at 4 (May 26, 2020) (“Viasat Modification”) (describing a public interest showing as “not necessary to demonstrate under a Section 25.117(d) analysis because of the presumption described above”).

<sup>10</sup> For example, in support of the application for its existing system, Viasat claimed that it would “combine the high throughput available through Viasat’s existing and planned GSO satellites with the ubiquitous coverage and low latency available through a NGSO platform,” enabling Viasat “to serve all areas of the country—including those that have been ‘left behind’ by terrestrial broadband providers” and therefore to “advance the Commission’s universal service objectives.” Petition for Declaratory Ruling, IBFS File No. SAT-PDR-20161115-00120, at 3 (Nov. 15, 2016). In support of its current modification, Viasat similarly claims that its proposed system will provide low-latency, high-capacity broadband service to underserved areas of the country. *See, e.g.,* Viasat Opposition at 55.

<sup>11</sup> “Viasat, Inc. (VSAT) Q4 2020 Earnings Call Transcript,” THE MOTLEY FOOL (May 26, 2020) (response by Mark Dankberg, Chairman of the Board and Chief Executive Officer of Viasat), <https://www.fool.com/earnings/call-transcripts/2020/05/26/viasat-inc-vsate-q4-2020-earnings-call-transcript.aspx>.

proclaimed primary factor driving this modification.<sup>12</sup> In any event, improving Viasat’s chances in future Commission subsidy programs is not a public benefit that can outweigh the obvious harms this modification will cause to other operators and to the space environment for centuries to come.

## DISCUSSION

### I. VIASAT’S MODIFICATION WILL SIGNIFICANTLY INCREASE INTERFERENCE.

In response to Viasat’s application, several commenters (including SpaceX) submitted analyses demonstrating that the proposed modification would likely result in significant increases in interference.<sup>13</sup> When confronted with this evidence, Viasat primarily lashes out at those who point out the flaws in Viasat’s application. Viasat also criticizes commenters for making incorrect assumptions about how Viasat intends to operate its system. However, those assumptions were drawn from Viasat’s own submissions to the International Telecommunication Union (“ITU”), including the databases proffered to substantiate its compliance with applicable equivalent power flux-density (“EPFD”) limits – the very source that Viasat said it was using for purposes of its own interference analysis.<sup>14</sup> Ironically, SpaceX asked that Viasat provide additional information on the assumptions used in its interference analysis,<sup>15</sup> but Viasat steadfastly refused to do so – and now criticizes others for taking Viasat at its word and relying on the technical parameters it has submitted to the ITU.

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<sup>12</sup> See Letter from Amy R. Mehlman to Marlene H. Dortch, IBFS File No. SAT-MOD-20200417-00037, at 2-4 (Sep. 17, 2020).

<sup>13</sup> See, e.g., SpaceX Petition at 3-15; Petition to Deny or Condition of O3b Limited, IBFS File No. SAT-MPL-20200526-00056, at 6-11 (Aug. 31, 2020); Petition to Deny or Defer Consideration, IBFS File No. SAT-MPL-20200526-00056, at Technical Appendix (Aug. 31, 2020).

<sup>14</sup> See Viasat Modification, Technical Annex at 13 (“Operational EPFD spectral densities have been used to model the VIASAT-NGSO transmitters based on the current grant and on the proposed modification.”).

<sup>15</sup> See, e.g., Letter from William M. Wiltshire to Marlene H. Dortch, IBFS File No. SAT-MPL-20200526-00056 (June 18, 2020); Letter from David Goldman to Marlene H. Dortch, IBFS File No. SAT-MPL-20200526-00056 (July 16, 2020).

But despite Viasat’s heated rhetoric, the core of Viasat’s response to these showings has nothing to do with their technical merits. Instead, Viasat’s complaint is merely that these analyses do not assume the outcome Viasat asserts; Viasat’s non-interference showing simply reduces to its promise that, interference analyses notwithstanding, it will somehow use a variety of generic strategies to operate its system without causing increased interference.<sup>16</sup> Thus, in the face of technical analyses demonstrating increased interference to other NGSO systems, Viasat simply falls back on its “commitment to ensuring that the actual operation of its modified system maintains the same expected operating environment with respect to other systems authorized in the 2016 Round that are implemented.”<sup>17</sup> While these sorts of self-serving “commitments” would be insufficient for any operator, they are particularly lacking for Viasat given its track record.

Viasat accuses others of “fail[ing] to account for” this claimed capability.<sup>18</sup> But here Viasat identifies the fundamental flaw of its *own* position, not that of others. The reality is that other operators *cannot* account for Viasat’s claimed capabilities because Viasat has not said specifically what they are, or how they will be used, beyond generic reference to power reduction, avoidance angles, and satellite diversity. This obfuscation makes it impossible for other operators to account for these claimed capabilities in their own interference analyses, much less in their actual operations.

Viasat proudly admits that its proposed modification will significantly increase the number of satellites in view from any site in the continental United States.<sup>19</sup> That also has the effect of

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<sup>16</sup> See, e.g., Viasat Opposition at 30-31 (asserting that a technical showing “fails to account for Viasat’s ability to ensure that its operations will stay within those I/N limits by using operational tools such as dynamic power limits, avoidance angles, and the number of co-frequency satellites serving a given location on the Earth at a given time”).

<sup>17</sup> *Id.* at 12 n.45.

<sup>18</sup> See, e.g., *id.* at 33.

<sup>19</sup> See *id.* 27-28. Viasat also asserts that lowering a system’s minimum elevation angle can also have the effect of increasing the number of satellites in view from a given location and criticizes SpaceX for ignoring that fact in

increasing the number of potential in-line interference events. The Commission specifically recognized that increasing the number of satellites in an NGSO constellation will also increase the potential for interference.

A system's orbital configuration can impact its ability to share with other systems and services by affecting the number of active satellites “visible” at a particular location. ***The magnitude of sharing difficulty increases with an increase in the number of active visible satellites in the modified system.*** Thus, a customer using another satellite system will have more difficulty operating with that system if the number of visible satellites in the modified system is increased.<sup>20</sup>

Although SpaceX cited this specific passage from *Teledesic* in its Petition, Viasat entirely ignores this key finding in its extensive discussion of the case.<sup>21</sup> Yet even if Viasat were to decide to leverage the new-found satellite diversity resulting from its modification proposal to prevent an increase in interference, other operators would have no way to predict whether or when Viasat will do so, without additional information. In other words, although Viasat may choose not to use a beam that would result in an in-line event in a given configuration and therefore avoid band splitting, other operators would have no way of knowing when or whether Viasat plans to take such an action – forcing them to either split the band regardless, or run the risk of harmful interference.<sup>22</sup> The same is true of Viasat’s promises to reduce power or take other steps as necessary to mitigate interference. If other operators do not know exactly what operational steps

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its own modification application. *See id.* at 14-15. Yet as SpaceX showed in that application proceeding, the combination of lower elevation angle and lower operating altitude had the effect of *decreasing* the average number of satellites in view. *See* Letter from David Goldman to Marlene H. Dortch, IBFS File No. SAT-MOD-20200417-00037, at 3 (June 29, 2020).

<sup>20</sup> *Teledesic LLC*, 14 FCC Rcd. 2261, ¶ 13 (IB 1999) (emphasis added) (“*Teledesic*”).

<sup>21</sup> *See* Viasat Opposition at 4-12. Viasat also attempts to confuse the issue by quoting SpaceX’s statements about the use of satellite diversity to coordinate spectrum usage and avoid in-line events. *See id.* at 11. However, the different context of those statements is critical. SpaceX was discussing its *initial application* in the processing round and therefore had no status quo to maintain – only prospective coordination with other applicants in the round. By contrast, Viasat is proposing a *modification* and therefore must demonstrate that the addition of more than fourteen times as many satellites as are currently authorized would not increase interference to other licensed NGSO systems above the current levels.

<sup>22</sup> Viasat’s ongoing refusal to provide beam pointing information to other NGSO operators further exacerbates this problem. *See id.* at 37-38.

Viasat plans to take to prevent interference, they cannot account for them and must therefore assume that band splitting will be necessary whenever satellites are geometrically aligned.

Viasat emphasizes that there is a difference between this type of geometric in-line event and true band-splitting events.<sup>23</sup> This is true, in theory. But Viasat's own failure to provide actionable information about its operations prevents the Commission and other operators from giving Viasat the benefit of this distinction. It is precisely because Viasat refuses to explain the precise actions it will take to limit harmful interference, and when it will take them, that neither other operators nor the Commission can account for them in predicting changes to the interference environment as a result of Viasat's proposed modification.

Viasat seems to suggest that SpaceX has relied on the same types of vague assurances that it will "stay within I/N limits" in its own modification requests.<sup>24</sup> Not so. Although SpaceX's system possesses the same spectrum sharing capabilities that Viasat appears to envision for its own modified constellation, it has never made these capabilities the lynchpin of its showings under *Teledesic* the way Viasat has. For example, in its April 2020 modification request, SpaceX provided a detailed interference analysis which, for each pair of systems considered, assumed that "the two systems do not implement any interference mitigation strategies."<sup>25</sup>

In addition to substantively failing to promote certainty for other operators, Viasat's because-we-say-so strategy would undermine the Commission's processing-round framework.

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<sup>23</sup> See, e.g., *id.* at 28. ("O3b does not even differentiate between (i) a mere geometric alignment and (ii) a circumstance that potentially could cause Viasat to exceed the -12.2 dB I/N trigger for band splitting."); 29 ("mere potential geometric alignments are not relevant.").

<sup>24</sup> *Id.* at 40.

<sup>25</sup> Application for Modification of Authorization for the SpaceX NGSO Satellite System, IBFS File No. SAT-MOD-20200417-00037, Attachment A, Annex 1 at A1-1 (Apr. 17, 2020) ("SpaceX 2020 Modification"). Viasat's application made a similar assertion. See Viasat Modification, Technical Annex at 12. However, Viasat's subsequent filings make crystal clear that it will, in fact, rely on various interference mitigation strategies in order to remain within the interference limits set during the processing round.



Just two months ago, the Commission rejected a similar request by Kuiper to be considered in an already-concluded processing round. Kuiper argued that there was no need to defer its application because it was able to use tools such as “(i) small spot beams; (ii) satellite diversity; (iii) flexible network control; and (iv) dynamic channel re-assignment” to share spectrum with other operators.<sup>26</sup> The Commission rejected such arguments, concluding that “the practical effect of adopting Kuiper’s position would be to create an open-ended processing round.”<sup>27</sup> The same is true here. If the Commission accepts Viasat’s gambit to seek a modified authorization in an already-concluded processing round based only on its *assertions* that it will take some undefined set of actions to ensure that it does not degrade the interference environment, the Commission can expect that all future applicants will happily make the same unenforceable “concession” to avoid deferral. It will then fall to the Commission and NGSO operators to shoulder the impossible burden of determining after the fact whether applicants are living up to these commitments. In the meantime, other operators will lack the information they need to predict their final interference environment as they proceed with the design and deployment of their systems—precisely the outcome the Commission has sought to avoid.

Thus, if it chooses to consider Viasat’s application at all, the Commission should do so within a subsequent processing round. According to Viasat’s own statements, the harm to Viasat of doing so would be minimal, given that the primary consequence would be a requirement that Viasat maintain the existing interference environment for first-round licensees—an outcome to which Viasat has already committed.

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<sup>26</sup> Consolidated Opposition and Response of Kuiper Systems LLC, IBFS File No. SAT-LOA-20190704-00057, at 16 (filed Nov. 13, 2019).

<sup>27</sup> *Kuiper Systems LLC*, 35 FCC Rcd. 8324, ¶ 42 (2020).

Alternatively, if the Commission chooses to process Viasat’s application in the context of first-round licensees, it should impose license conditions that give real substance to Viasat’s vague assertions that it will operate in a manner that fully protects other first-round licensees against additional interference. Importantly, any conditions must be specifically designed to ensure that Viasat’s compliance with these commitments can be verified and enforced before Viasat causes harm to other NGSO operators. Moreover, the Commission must make explicit to Viasat the consequences of violating conditions on its license and other Commission rules.

Viasat asserts that it “has a number of tools available to manage the operation of its modified NGSO FSS system and ensure that it does not exceed the interference profile of its pre-modified system with respect to other same-round NGSO FSS systems. Moreover, Viasat expressly has committed to do so.”<sup>28</sup> To implement this commitment, a suitable condition would require that Viasat must, prior to commencing operations, do one of three alternatives:

- (1) notify the Commission in writing that it has reached a coordination agreement with each first-round NGSO FSS satellite system licensee that has begun deployment of its system;
- (2) seek and obtain the Commission's approval of a further modification that includes detailed technical demonstrations of how Viasat will protect each first-round NGSO FSS satellite system with which it has not reached such an agreement; or
- (3) notify the Commission in writing that Viasat will bear the responsibility for using its operational capabilities to avoid *all* in-line events with first-round NGSO FSS licensees.

This would satisfy Viasat’s evident goal of maintaining maximum flexibility as it designs its system without forcing other NGSO operators to pay the price for it, in the form of a more challenging and less certain operating environment.

Notably, unless Viasat could come to agreement with other NGSO operators or describe with greater precision and to the Commission’s satisfaction exactly how it will protect such

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<sup>28</sup> Viasat Opposition at 29.

operators, this condition would require Viasat to bear the burden of avoiding all band-splitting events with other first-round licensees, and not just the additional instances that result due to its license modification. This condition is necessary because there will be no way for other operators—or Viasat, for that matter—to know which band-splitting events would constitute increased interference due to the modification, and which would be within the envelope established by the original parameters of the processing round. Nor would other NGSO operators have any way of knowing in which in-line events Viasat would be employing non-interference strategies and which it would not. This outcome is equitable because this is a problem of Viasat’s own making, exacerbated by Viasat’s pointed refusals to provide more concrete, actionable information about its operational plans and system characteristics. Accordingly, such a condition achieves many of the same policy goals as deferral to a later processing round.

## **II. VIASAT VASTLY EXCEEDS ITS OWN PROPOSED COLLISION-RISK LIMITS.**

In its Petition, SpaceX raised significant concerns that Viasat’s collision risk analysis unrealistically assumed that it could successfully maneuver all of its satellites into their intended disposal orbits. Thus, Viasat ignored the possibility that some number of its satellites would fail on orbit and therefore remain significant sources of debris at a crowded orbital altitude for potentially thousands of years. Because Viasat did not provide even the most basic information about its satellites, SpaceX was forced to deduce these parameters from what little information Viasat provided, and then use that information to evaluate the true collision risk presented by Viasat’s proposed system.<sup>29</sup> The results of this analysis confirmed that Viasat’s system presents a

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<sup>29</sup> SpaceX Petition at 18-25.

total collision risk *170 times* greater than it has claimed, far exceeding Viasat's own proposed collision-risk threshold.

As predicted, rather than truly address the risks it poses to the orbital environment, Viasat tries to change the subject and distract the Commission from its failings. Viasat responded with a hyperbolic attack on SpaceX that provided only the barest response to the important points SpaceX raised about Viasat's own system. Of course, despite Viasat's hopes to the contrary, it is Viasat's proposed modification that is under consideration here. The alleged failure rate of SpaceX's own satellites is plainly irrelevant to this analysis. Moreover, even Viasat's own allegations are based on documented misrepresentation of the data.<sup>30</sup> If Viasat decides to observe the actual facts, it should take note of the fact that, as SpaceX has previously disclosed,<sup>31</sup> the failure rate of SpaceX's most recently deployed 233 satellites has been 0%. Thus, Viasat's rhetoric about the reliability of SpaceX's satellites is inaccurate in addition to being irrelevant. For the sake of comparison, Viasat operates three satellites (one of which is a payload on a Hughes spacecraft), and experienced a significant anomaly on the one most recently deployed.<sup>32</sup>

This distraction aside, Viasat's response either confirms or conspicuously does not dispute the most important points raised in SpaceX's Petition. Viasat appears to acknowledge that its collision-risk assessment assumed that its satellites would be reliably maneuvered into their intended disposal orbits<sup>33</sup> and therefore concealed the risk that some of its satellites may fail before

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<sup>30</sup> See McDowell Letter, *supra*.

<sup>31</sup> See Letter from David Goldman to Marlene H. Dortch, IBFS File No. SAT-MOD-20200417-00037, Attachment at 5 (Sep. 14, 2020).

<sup>32</sup> See Caleb Henry, "Viasat preps big insurance claim for Viasat-2 antenna anomaly," SPACE NEWS (May 30, 2018), <https://spacenews.com/viasat-preps-big-insurance-claim-for-viasat-2-antenna-anomaly/>.

<sup>33</sup> See, e.g., Viasat Opposition at 44 ("Viasat also factored into its design requirements a requisite level of satellite reliability, with the expectation that the Commission will adopt policies regarding reliability when it resolves certain proceedings currently pending before it.").

they can be actively deorbited. Similarly, although it criticizes SpaceX’s “recursive-DAS” analysis, Viasat does not claim that SpaceX made any material error in deducing the relevant characteristics of Viasat’s satellites. It also does not refute the result of SpaceX’s analysis that the true long-term risk presented by Viasat’s system “is over 170 times the 0.001 system-wide collision risk”<sup>34</sup> that it has claimed.

Viasat chastises SpaceX for suggesting that the Commission second-guess Viasat’s reliability assertions—even if they are, as Viasat effectively concedes, merely design goals, and not concrete representations about the performance of real satellites.<sup>35</sup> But, other than casting aspersions, Viasat provides little response to SpaceX’s demonstration that Viasat’s asserted lifetime collision risk is inconsistent with its 99.5% reliability claim. Indeed, SpaceX’s analysis indicates that Viasat’s collision probability assessment could only be accurate if Viasat had inappropriately assumed a reliability rate of 100% for the active deorbit phase of its operational plans. Alternatively, in attempting to model the collision risk across the 15-year lifetime of its satellites,<sup>36</sup> perhaps Viasat overlooked the fact that, at its chosen altitude, failed satellites would remain in orbit and present a significant orbital-debris risk long after the end of their 15-year missions, compounding the collision risk.<sup>37</sup> Although SpaceX agrees that its recursive DAS

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<sup>34</sup> SpaceX Petition at 25. Viasat does, however, misrepresent SpaceX’s assertion regarding Viasat’s  $\Delta V$  reservation. SpaceX did not assert that Viasat’s satellites would have insufficient  $\Delta V$  to perform pre-disposal maneuvers. Rather, SpaceX merely used Viasat’s claim that it would reserve 256 m/s of  $\Delta V$  to deduce that Viasat’s planned deorbit maneuvers consist only of “a single impulse burn to move perigee from 1,300 to 300 km,” and noted that this level of reserve would leave no additional fuel for further maneuvers. *Compare* SpaceX Petition at 20 *with* Viasat Opposition at 50.

<sup>35</sup> Viasat Opposition at 46 (“Top level requirements (in this case for collision risk and probability of successful deorbit) are used to generate lower level requirements (i.e., the necessary reliability of the satellite maneuver capability).”).

<sup>36</sup> *Id.* at 49.

<sup>37</sup> Viasat erroneously asserts that SpaceX has not provided demise times for satellites at operational altitudes in its own modification applications. *See id.* at 51 n.208. To the contrary, SpaceX has not only provided such information, but has done so with respect to satellites assuming different failure modes and solar activity levels. *See, e.g.,* SpaceX 2020 Modification, Attachment A at 19-20; Application for Modification of Authorization for

methodology does not reflect a standard approach to analyzing long-term collision risk, there is little reason to doubt its approximate accuracy. Certainly, Viasat has provided none. Thus, given the 170-fold discrepancy between Viasat's asserted collision risk and the result of SpaceX's analysis, the Commission has ample reason to scrutinize Viasat's collision-risk claims, especially in light of Viasat's failure to provide the information required to assess them and its parallel efforts to distract from these deficiencies.

As SpaceX also noted, Viasat itself has advocated that the Commission assess orbital debris by assuming that a full ten percent of satellites fail in a system.<sup>38</sup> Yet Viasat will not apply that approach to its own operations. As SpaceX clearly explained in its Petition, it does not endorse the rigid application of these types of per-constellation collision metrics.<sup>39</sup> SpaceX's objection is that *Viasat* continues to advance such requirements as applied to U.S.-licensed systems, even though it plainly cannot devise a way to satisfy them for its non-U.S. licensed system, even with an idealized constellation that exists only on paper. It is critical for the Commission to recognize Viasat's gambit for what it is: an attempt to hamstring its U.S.-licensed competitors by holding them to an unworkable collision-risk limit while avoiding application of this limit to its own system by seeking U.S. market access rather than a U.S. license, and omitting critical information in the materials it provides to the Commission.

## CONCLUSION

Setting its rhetoric aside, Viasat's response to petitions filed by SpaceX and others ironically clarifies the question before the Commission as it considers Viasat's application: should

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the SpaceX NGSO Satellite System, IBFS File No. SAT-MOD-20181108-00083, Attachment A at 39-40 (Nov. 8, 2018).

<sup>38</sup> See SpaceX Petition at 25 and n.48.

<sup>39</sup> *Id.* at 26.

the Commission authorize a modification that would radically expand the number of Viasat satellites within the scope of a previous processing round based solely on Viasat's conclusory assertions that it will limit interference, even though:

- Viasat provides only the vaguest information about the operational techniques it will use to achieve this goal, and
- Viasat steadfastly refuses to share with other NGSO operators the information they would need in order to account for these operational techniques?

An affirmative answer to this question would clearly be contrary to the public interest. It would fail to preserve the stable and predictable operating environment the Commission sought to create in its processing round regime by denying other NGSO operators the crucial information they would need to anticipate the specific measures Viasat will take to limit interference and plan their own operations with these operational characteristics in view. It would also force licensees to account for the fact that enforcing such a commitment will be extremely challenging, both for Viasat and the likely endless parade of future applicants that seek to use the same strategy to shoehorn a new or expanded system into a prior processing round.

Viasat's responses also clarify and largely confirm that Viasat's proposed modification cannot meet Viasat's own preferred collision-risk limits. By either confirming or failing to address several important aspects of SpaceX's analysis of Viasat's system, Viasat demonstrates that it cannot meet these limits even when freed from the constraints of characterizing satellites that exist beyond the drawing board. The Commission should bear this failure in mind when assessing Viasat's non-stop criticisms of other systems.

Respectfully submitted,

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September 25, 2020



**CERTIFICATE OF SERVICE**

I hereby certify that, on this 25<sup>th</sup> day of September, 2020, a copy of the foregoing pleading was served via First Class mail upon:

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