

2020 Sep 21

To whom it may concern

Dear FCC,

I wish to correct misinterpretations of my work cited in the document 'Consolidated Opposition to Petitions and Response to Comments of Viasat Inc', dated Sep 15, 2020 and other documents from Viasat discussing the reliability of SpaceX's Starlink satellites.

Page 52 of the document mentioned above cites my work, available at <https://planet4589.org/space/stats/megacon/starbad.html>, as suggesting that the SpaceX Starlink satellites have a 7 percent failure rate. This is a misreading of my results. They appear to be counting satellites which have been deliberately removed from orbit as 'failed' - an inexplicable interpretation. SpaceX have explicitly stated that the V0.9 satellites are being actively retired, and my analysis of the orbital data supports this.

A reasonable assessment of Starlink system reliability is, first, to consider only the 653 satellites (as of Sep 20) of the 'V1.0' system (neglecting the 60 early prototypes of the single V0.9 launch as unrepresentative). Of these satellites, inspection of the orbital data versus time suggests that 17 appear to have POSSIBLY failed (columns 'reentered after fail' and 'not maneuvering'). This represents a 2.6 percent failure rate. This rate is an upper limit, as some of these non-maneuvering satellites may be undergoing tests rather than actually failed.

My characterization of satellites as 'not maneuvering' is based on analysis of public orbital data. There is some uncertainty involved but the number derived should be a good upper limit. The further inference that these satellites are failed is just that, an inference. In some cases this inference is supported by SpaceX's reports to the FCC which acknowledge a certain number of failures, but without specifically identifying the satellites in question.

Even if you include the V0.9 system, the failure rate is then 25 out of 713, so 3.5 percent. Four satellites of the V1.0 system were deorbited prematurely - they may have failed in some way, but if so it's in a benign way that did not pose a threat to other space users. Even including these (which I feel is inappopriate) would represent at most a 4 percent rate. To include the deliberate retirement of the V0.9 satellites as failures, which Viasat appear to be doing, does not seem remotely justifiable to me.

I further note that my definition of 'failure' applies only to propulsive capability, not to the state of the communications payload. This is the appropriate definition when you are worried about risks to other space users.

To summarize, a fair assessment of my analysis of the Starlink system is that the current failure rate of the V1.0 satellites is at most about 3 percent (and possibly less), not 7 percent.

Sincerely,



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