October 21, 2015

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

Re: File No. 0356-EX-PL-2015

In its latest release of technical data regarding its application – a new Exhibit 8 called "Additional Information on the MicroSat System" – SpaceX provides additional information regarding collision avoidance activities, broadband test operations, and Ku-band downlink satellite antenna patterns. By committing to work with JSpOC and appointing a point of contact, Exhibit 8 satisfies Intelsat's previously voiced concern regarding ensuring collision avoidance. Nonetheless, it does little to address Intelsat's concern about co-frequency interference.

Specifically, Intelsat's *ex parte* statement of September 9, 2015, calculated that SpaceX space-to-earth transmissions could increase the GSO earth station receiver noise floor by almost 24% -- four times the single-entry coordination trigger, and in excess of the multiple entry allowance recommended by relevant ITU-R recommendations.[1] SpaceX's Exhibit 8 ignores this, and instead provides spacecraft antenna patterns when communicating with SpaceX gateways. The patterns do not, however, answer the main question Intelsat raised in its filings – whether SpaceX can reasonably be expected to operate on a non-interference basis with respect to co-frequency GSO operations.

The reason is as SpaceX tracks its gateway stations, nearby GSO receive earth stations will not be rendered interference-free by the roll-off of the SpaceX transmit antenna. Intelsat already assumed that SpaceX would suppress emissions at ± 12 degrees from boresight of a GSO receiver[2]—and calculated that GSO receivers would experience harmful interference. Plus, SpaceX never accounted for interference to sidelobes and backlobes of nearby GSO receivers that may be receiving SpaceX satellite transmissions more than 12 degrees off boresight. In sum, not only does SpaceX fail to address Intelsat's demonstration, its 30 pages of transmit antenna off-axis radiation patterns are near-irrelevant to assessing the interference SpaceX downlinks could cause nearby GSO earth stations.

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[1] Letter from Carl R. Frank to Marlene Dortch, File No. 00356-EX-PL-2015 (filed Sept. 9, 2015), at 2, 4.

[2] *Id.* at 4, row 9.

SpaceX latches on to -160dB(W/m^2)40kHz as if it were the standard for non-interference in the FSS bands. But even a cursory examination of Article 22 of the ITU Radio Regulations reveals a more complex calculus. In the downlink FSS bands, the limits vary by the size of the GSO receive earth station and the allowable epfd is not a fixed number – such as -160dB(W/m^2)40kHz – but a probabilistic figure with different epfd values associated with percentages of time these values may not be exceeded.[3] Put differently, the inquiry cannot end at SpaceX's assertion that its downlink emissions will remain at or below -160dB(W/m^2)40kHz. The ITU Radio Regulations and FCC rules include additional limits on the percentage of time such emissions even may exceed somewhat reduced levels, which still could cause unacceptable interference to GSO receivers.

SpaceX's new Exhibit 8 may well provide incumbent FSS operators additional technical elements necessary to run interference simulations. But such simulations would be time-consuming -- a burden that should not fall on incumbent FSS operators. Each incumbent FSS operator should not have to spend considerable time and resources determining the risk of interference posed by an experimental license application. Rather, before authorizing this experiment, the Commission must ascertain that co-frequency GSO operators reasonably can expect their existing operations will be protected. The simple solution is to require the applicant -- SpaceX – *to demonstrate it can meet the requirements of 47 C.F.R. § 5.84*, which is designed to protect co-frequency operations, including GSO receivers. This is especially important here, where the source of harmful interference likely will be intermittent and thus extremely difficult to identify.

Very truly yours,

/s/ Susan H. Crandall

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[3] ITU Rad. Reg. Table 22-1A (WRC-2012).