

November 3, 2015

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: Expanding Access to Broadband and Encouraging Innovation through the Establishment of an Air-Ground Mobile Broadband Secondary Service for Passengers in the 14.0-14.5 GHz Band; GN Docket No. 13-114, RM-11640

Dear Ms. Dortch,

The above referenced proceeding evolved out of Qualcomm's petition to establish an air-to-ground mobile service ("AMS") in the 14.0-14.5 GHz frequency band on a secondary basis.¹ Because the Fixed Satellite Service ("FSS") is primary in the proposed band, the Commission must ensure FSS uplinks are protected.

The critical issue in this proceeding is setting limits to ensure that any secondary system, including Qualcomm's proposed AMS, does not raise the noise floor over thermal noise ($\Delta T/T$) ("rise over thermal" or "RoT") in excess of that allowed by the International Telecommunications Union ("ITU"). Qualcomm and its allies initially argued that they were entitled to consume as much as 6% RoT² based on an incorrect reliance on Table 5-1 of Appendix 5 of the ITU Radio Regulations. The FSS industry noted that the 6% figure applies only to interference between primary allocations,³ and instead pointed to ITU-R Recommendation S.1432, which establishes that the *cumulative* interference from *all* noise sources (including secondary services) into a primary FSS link should not exceed 1% RoT.⁴ Given there are at least two *additional* secondary services in portions of the 14.0-14.5 GHz band – TDRSS and Federal Fixed and Mobile services⁵ – any new secondary service should be allocated no more than a third of the amount of interference permitted by the ITU-R Recommendation, or 0.33% RoT.⁶

Although Qualcomm subsequently acknowledged that ITU-R S.1432 is the correct standard and committed to limit to 1% the aggregate increase in $\Delta T/T$ caused by its system,⁷ it has failed to incorporate the existence of other secondary users in the band into its calculations.

¹ See *Notice of Proposed Rulemaking*, 28 FCC Rcd 6765 (2013).

² See *Qualcomm Petition for Rulemaking*, RM-11640, at A-11 (filed July 7, 2011).

³ See *Comments of the Satellite Industry Association*, GN Docket No. 13-114, at 13 (filed Aug. 26, 2013).

⁴ *Id.* at 7-9.

⁵ *Id.*, Technical Annex at 7.

⁶ See *Reply Comments of the Satellite Industry Association*, GN Docket No. 13-114, at 6 (filed Sept 23, 2013).

⁷ Letter from John W. Kuzin to Marlene Dortch, GN Docket No. 13-114, at 3 (filed Feb. 7 2014).

Once these other secondary users are taken into consideration, Qualcomm must limit its AMS system RoT into FSS to no more than 0.33% $\Delta T/T$.

On July 30, 2015, SpaceX raised similar concerns regarding Qualcomm's potential to raise the noise floor above the levels allowed by the ITU. SpaceX noted that, while Qualcomm claimed its proposed system would account for less than 1% of the RoT for NGSO FSS systems, SpaceX had confirmed that, using the specifications of its proposed NGSO system in Qualcomm's methodology, Qualcomm's "air-ground system in fact would account for over 6% of RoT for SpaceX's [planned] NGSO FSS system."⁸ On October 7, 2015, however, SpaceX and Qualcomm filed a joint letter saying that after further technical discussions between the two companies, they agreed that Qualcomm's commitments would adequately protect SpaceX's proposed NGSO system.⁹ That letter, however, was premised on the erroneous notion that the proposed AMS "will be the only non-primary user of the band" and the operator "shall control RoT to NGSO satellite systems to ensure that the aggregate interference from [its] service accounts for no more than 1% of RoT of the FSS link budget set out in ITU recommendation S.1432."¹⁰ But because SpaceX and Qualcomm ignore noise from other secondary users in the 14.0-14.5 GHz band, their conclusion is factually wrong. As SIA previously stated:

[The ITU] has established that the aggregate interference from all non-primary services should not cause more than a 1% Rise-over-Thermal into the primary FSS. As a result, if the Commission were to decide to proceed with a secondary AMS allocation, it should not allocate the entire 1% to that single secondary service. Instead, given the other secondary services in the band, and the realistic possibility of at least one future secondary service (either within the United States or in neighboring countries), the proposed AMS should be allotted only a third of that budget. Such apportionment is consistent with the positions taken by the U.S. at the ITU.¹¹

Nothing has changed since SIA made that statement. Although SpaceX and Qualcomm may have reached an agreement, that pact cannot change the laws of physics, the Table of Allocations or the ITU-R Recommendations. In assessing the rules that should apply to Qualcomm's proposed service, the Commission cannot ignore existing interference from the two other secondary users operating in the 14.0-14.5 GHz band. Given that, should the Commission chose to authorize some form of AMS, it should follow ITU-R Recommendation S.1432, but

⁸ *Id.*

⁹ Letter from Henry Goldberg and Dean R. Brenner to Marlene Dortch, GN Docket No. 13-114, at 1 (filed Oct. 7, 2015).

¹⁰ *Id.*

¹¹ Letter from Patricia Cooper, President, Satellite Industry Association, GN Docket No. 13-114, at 2 (filed Nov. 18, 2013).

allot the AMS no more than 0.33% RoT—so that the *aggregate* RoT into an FSS link stays at or below the 1% $\Delta T/T$ figure permitted by the ITU-R Recommendations.

Very truly yours,

/s/ Susan H. Crandall

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