

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)
)
Amendment of the Commission’s Rules with) GN Docket No. 12-354
Regard to Commercial Operations in the)
3550-3650 MHz Band)

REPLY OF THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association (“SIA”) hereby submits this reply regarding its petition for reconsideration in the above-captioned proceeding.¹ No party opposes SIA’s requests to make future fixed-satellite service (“FSS”) earth stations co-primary in the 3550-3700 MHz band (“3.5 GHz band”),² or to add greater protections for foreign FSS operations,³ and these measures should therefore be adopted. As discussed below, SIA’s proposals for other changes in the regulatory framework for the Citizens Broadband Radio Service (“CBRS”) are justified in order to facilitate non-interfering co-existence of CBRS with FSS operations.

I. STRICTER TECHNICAL LIMITS WILL REDUCE PROTECTION DISTANCES

The SIA Petition demonstrates that the CBRS technical standards, including the limits on out-of-band emissions (“OOBE”), power levels and antenna heights, directly affect the separation distances needed to prevent CBRS operations from interfering with FSS networks and other incumbent services. Implementing tighter standards will allow reduced protection distances between FSS earth stations and new CBRS installations.

¹ Petition for Reconsideration of the Satellite Industry Association, GN Docket No. 12-354, filed July 23, 2015 (the “SIA Petition”).

² *Id.* at 22-24.

³ *Id.* at 24-25.

OOBE: The SIA Petition makes clear that the OOBE limits adopted by the Commission threaten critical satellite services and were implemented without the required legal notice.⁴ SIA's outside engineering analysis quantifies the impact, showing that separation distances given these less stringent OOBE limits must be substantially greater, up to more than 15 km.⁵ Although a number of parties object to stricter OOBE limits,⁶ none of them disputes the results of the SIA technical showing.⁷ To the contrary, Verizon confirms the SIA claims, suggesting that FSS operations will be harmed only if separation distances are inadequate, and that the FCC can account for that risk by increasing protection distances in the upper portion of the 3.5 GHz band.⁸ This is exactly SIA's point: that the Commission's decision to loosen the OOBE limits necessarily requires larger separation distances to ensure FSS systems are not disrupted.⁹

Opponents' claims regarding the legal validity of the adopted OOBE limits¹⁰ are equally unavailing. Qualcomm observes that the possibility that the 3650-3700 MHz band would be

⁴ *Id.* at 3-6.

⁵ *Id.* at 8-9 & RKF Engineering Technical Annex.

⁶ *See, e.g.*, CTIA Opposition at 3-4.

⁷ Qualcomm suggests that before the Commission considers strengthening the OOBE limits, it should "verify that satellite receiver blocking is not the actual limiting factor, in which case more stringent OOBE limits will not help and would impose an unnecessary regulatory burden." Comments of Qualcomm at 9. Analyses performed by both SIA and Google, however, have already demonstrated that the separation distance required to prevent interference at any given set of power and OOBE limits exceeds that needed to prevent overload of the FSS receiver. *See* SIA Comments, GN Docket No. 12-354, filed July 14, 2014 at 18-19.

⁸ Verizon Opposition at 4-5.

⁹ Google is simply wrong on the facts when it claims that experience in the 3.65 GHz band undercuts SIA's arguments for stricter OOBE limits for CBRs. Google points to a Hagerstown, MD earth station, E030101, that is within 10 km of several WISP deployments even though Google says its operations are not entitled to protection. Google Response at 4. In fact, however, the Commission granted E030101 co-primary status in the 3.65 GHz band within a specified protection area. *See Intelsat LLC*, 26 FCC Rcd 3459 (Sat. Div. 2011). The WISP sites in the vicinity were coordinated with Intelsat, which determined that the WISP deployments would not interfere with operations of E030101 and the other nearby Intelsat 3.65 GHz earth stations.

¹⁰ *See* CTIA Opposition at 3-4; Comments of Qualcomm at 8.

made part of CBRS was discussed from the very beginning.¹¹ While Qualcomm's characterization is accurate, the fact remains that the Commission did not discuss the implications of including that spectrum for the OOB regime before it adopted the Order.¹² Thus, SIA and other interested parties were deprived of the opportunity to comment on the risks created by extending the roll-off from the 3.5 GHz band into the conventional C-band.

Power and Antenna Height Limits: As with the OOB regime, the Commission's decisions to implement higher power limits for non-rural Category B Citizens Broadband Radio Service Devices ("CBSDs") and place no constraint on antenna heights for Category B CBSDs will necessarily increase necessary separation distances. Google complains that SIA had not previously requested more stringent power restrictions for CBRS,¹³ but the reason for that is simply that the power levels adopted by the Commission in the Order were higher than those it had previously proposed.¹⁴

Google also notes that SIA acknowledges that the interference potential associated with higher power levels can "be mitigated by the adoption of increased separation distances."¹⁵ Similarly, WISPA observes that although antenna height has an important effect on interference, the Spectrum Access System ("SAS") will take height into account to prevent interference.¹⁶ Again, however, that is precisely the point SIA is making: by increasing power levels for CBRS and setting no height limit, the Commission is locking itself into a situation where distances

¹¹ Comments of Qualcomm at 8.

¹² See SIA Petition at 5-6, *citing Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) ("Order") at ¶ 186.

¹³ Google Response at 5-6.

¹⁴ See SIA Petition at 7.

¹⁵ Google Response at 6.

¹⁶ Wireless Internet Service Providers Association ("WISPA") Opposition at 5.

needed to protect FSS will be larger, limiting the geographic areas in which CBRS networks can be deployed. Commenters who urge higher power levels and unlimited antenna heights to increase CBRS coverage areas ignore this basic cause and effect relationship.¹⁷

II. ENFORCEMENT MECHANISMS MUST BE IMPROVED

The SIA Petition outlines a number of critical changes required to ensure that any interference from CBRS transmissions to FSS earth stations is immediately addressed. No party opposes SIA's request that the Commission reconsider the rules to implement a procedure for addressing any interference complaints, including strict time deadlines for resolution of such issues.¹⁸ Accordingly, the Commission should make this important change.

The SIA Petition also highlights the potential adverse effects on FSS operations of the 60-second delay permitted under the rules for a CBSD to cease or alter its transmission as instructed by the SAS database administrator.¹⁹ Google and WISPA oppose any change to the limit, arguing that a faster response time is beyond the capabilities of the system.²⁰ But this is no answer to the SIA concerns. Instead, the parties' admission that the database system created under the CBRS framework is incapable of eliminating interference to an incumbent network in time to prevent adverse effects on operations negates the premise on which the tiered sharing approach set forth in the Order is based.

Google suggests that protection of critical satellite telemetry during launch and early orbit phase ("LEOP") or drift operations could best be addressed by the SAS "on a limited-time basis" by allowing the satellite operator to advise the SAS of "times and places of special operations

¹⁷ See CTIA Opposition at 5-6; Federated Wireless Opposition at 2-4 & 13-14; T-Mobile Response at 6-7; Verizon Opposition at 3-4.

¹⁸ SIA Petition at 10-11.

¹⁹ *Id.* at 11-12, *citing* new Section 96.39(c)(2).

²⁰ Google Response at 20; WISPA Opposition at 3.

that may not otherwise be protected by the SAS as part of its routine functions.”²¹ Google’s terminology is telling, as protection of incumbent FSS operations at *all* times and places should be an essential part of the “routine functions” of the SAS. Moreover, Google’s suggestion for special short-time protections for LEOPs and drifts ignores the potential adverse impact of CBRS interference on FSS commercial operations, which require a high degree of reliability twenty-four hours a day, seven days a week,²² not just protection on a “limited-time basis.”

The SIA Petition also requests that the Commission adopt a rule similar to Section 15.407(c) to require that a CBSD cease transmission automatically if the device malfunctions or loses contact with the SAS.²³ The only party to object to this straightforward proposal is WISPA, which argues that “losing contact with the SAS does not convert a non-interfering CBSD into an interfering CBSD.”²⁴ While that may be true, if a malfunctioning CBSD or one that is out of contact with the SAS does cause interference, there would be no reliable way for the SAS to correct the problem. To prevent such interference, the Commission should adopt an automatic shut-off rule for CBSDs.

III. THE COMMISSION SHOULD ABANDON “PROFESSIONAL” INSTALLATION OF CBSDs AND USE WORST CASE ASSUMPTIONS IF LOCATION ACCURACY REQUIREMENTS ARE NOT MET

Given the importance of accurate CBSD location information and the problems encountered in connection with location data in the television white spaces (“TVWS”) databases, both SIA and NAB urge the Commission to require inclusion of geolocation capability in lieu of

²¹ Google Response at 20.

²² See SIA Petition at 10.

²³ See *id.* at 12-13.

²⁴ WISPA Opposition at 4.

“professional” installation of CBSDs.²⁵ If a device’s location cannot be determined with sufficient accuracy to meet the standards in the Order, NAB and others suggest that worst case assumptions regarding the position of the CBSD be used by the SAS in making calculations to determine whether and under what parameters devices should be allowed to transmit.²⁶

A number of parties agree that accurate location data is critical to the feasibility of spectrum sharing²⁷ but oppose the relief requested by SIA and NAB. These commenters fail to make a persuasive case for retaining the “professional” installation option. For example, Federated Wireless and Google both claim without support that the experience in the TVWS context described by NAB and SIA is not relevant to the Commission’s determinations here.²⁸ Federated Wireless suggests that the 3.5 GHz band has “unique characteristics”²⁹ but fails to explain how those characteristics would result in device location data that would be more reliable than the contents of the TVWS databases. Similarly, one cannot dispute Google’s observation that CBRS involves a “different spectrum band and a different set of rules”³⁰ than the TVWS proceeding, but Google does not identify any specific distinctions that would bear on the accuracy of location information.³¹ Federated Wireless’s statement that professional installation

²⁵ SIA Petition at 13-15; Petition for Reconsideration of the National Association of Broadcasters, GN Docket No. 12-354, filed July 23, 2015 (“NAB Petition”) at 5-7.

²⁶ See NAB Petition at 8; Petition for Reconsideration of the Wireless Innovation Forum, GN Docket No. 12-354, filed July 22, 2015 (the “WinnForum Petition”) at 11.

²⁷ See Federated Wireless Opposition at 9-10 (there is “no doubt that the spectrum sharing regime envisioned by the Commission for the Citizens Band necessitates accurate CBSD location information to allow the SAS to coordinate users and protect incumbents from harmful interference”) (footnote omitted); T-Mobile Response at 9 (agreeing with NAB “that accurate location information is essential to coordinate users in the 3.5 GHz band”).

²⁸ Federated Wireless Opposition at 9; Google Response at 10-11.

²⁹ Federated Wireless Opposition at 9.

³⁰ Google Response at 10.

³¹ Google also attempts to explain away the erroneous data in the TVWS databases by characterizing them as “innocent test entries.” *Id.* at 11. But whether or not the false

has been successfully relied on for two-way satellite broadband terminals³² is accurate but not pertinent here –professional installation is used in that context to ensure the antenna is correctly pointed for service quality purposes, not to establish individual terminal locations.

The claim by Federated Wireless that both SAS administrators and CBRS licensees will have strong incentives to ensure the accuracy of CBSD geolocation information³³ is also wholly unsupported. In fact, it seems likely that the reverse would be true. An SAS administrator who is competing for the business of managing CBRS operations would seem to have limited incentives to police the accuracy of CBSD location data if the data would show a proximity to a protected FSS or Defense Department installation that would limit or prohibit CBSD operation.³⁴ Nor would a CBSD operator be likely to insist on accurate location information that would curtail its ability to offer service.

Google’s objection to the SIA suggestion that the Commission require SAS administrators to employ verification measures for location data³⁵ is similarly unfounded. Google claims that Section 96.61 of the rules “establishes reasonable security and verification procedures,”³⁶ but in fact that provision says nothing about validating the accuracy of location data – the only verification duty imposed by the rule concerns the FCC identification number assigned to certified CBRS devices.³⁷ Federated Wireless observes that there are “a variety of

information was entered maliciously, the fact that numerous inaccurate data entries in the TVWS databases went unidentified and uncorrected until NAB performed its review demonstrates that relying on “professional” installation to ensure data accuracy was a failure.

³² Federated Wireless Opposition at 12.

³³ *Id.* at 11-12.

³⁴ There is certainly no indication that any of the TVWS database administrators was proactive in tracking down and deleting obviously incorrect or falsified location data.

³⁵ Google Response at 14-15.

³⁶ *Id.* at 15.

³⁷ *See* 47 C.F.R. § 96.61(c).

quality control methods” that an SAS administrator can use to verify a device’s location.³⁸

Given the availability of such methods and the importance of location accuracy, the Commission should explicitly require every SAS to take steps to confirm the validity of CBSD location data.

The record supports the arguments of SIA and NAB that worst case assumptions regarding device location must be employed in SAS calculations if conditions prevent a CBSD from reporting its location accurately.³⁹ Google agrees that if a device’s location uncertainty exceeds the Commission’s specifications, “the spectrum available to it should be calculated based on the possibility that the device could be anywhere in the radius of uncertainty.”⁴⁰ In addition, there is no objection to SIA’s request that the Commission correct Section 96.39(a)(3) to specify that a change in either horizontal or vertical location that exceeds the latitude set forth in the rule must be reported.⁴¹ These measures should therefore be adopted.

IV. ANNUAL EARTH STATION REGISTRATION IS UNNECESSARY

The SIA Petition demonstrates that the registration requirements imposed by Section 96.17 on FSS earth station licensees in order to ensure they are protected from CBRS interference are “unnecessary, unduly burdensome, and inconsistent with the FSS licensing regime.”⁴² In particular, SIA shows that the vast majority of the data regarding FSS earth station parameters is already on file with the Commission in its IBFS licensing database, and replicating that information for conventional and extended C-band earth stations every year serves no

³⁸ Federated Wireless Opposition at 10.

³⁹ *See, e.g.*, NAB Petition at 8.

⁴⁰ Google Response at 14 (footnote omitted).

⁴¹ *See* SIA Petition at 15-16.

⁴² *Id.* at 16.

conceivable purpose.⁴³ Instead, it introduces the possibility of inconsistency and errors, while creating a substantial annual paperwork burden.⁴⁴

Parties who attempt to justify this yearly filing requirement provide no support for their arguments. Google suggests that the annual submission is necessary to ensure that information is not “stale,”⁴⁵ and Verizon similarly questions whether the information contained in the IBFS database is “accurate and up to date.”⁴⁶ Neither party, however, presents any evidence to suggest that relying on the IBFS database would be problematic. To the contrary, both Google and Verizon hold earth station authorizations and should therefore know that licensees are required by Commission rule to ensure that information regarding their operations is current and correct. Moreover, since licensees are subject to an annual regulatory fee for each earth station, they have an incentive to relinquish any license not in use. Accordingly, there is no reason why the IBFS database cannot be used to supply the necessary data regarding earth station technical parameters that will be needed by the SAS administrators.⁴⁷

Opponents also attempt to downplay the burden imposed by the annual filing requirement, arguing that since SIA concedes that the earth station licensees have the needed data in their possession, it would not be that hard for them to supply it year after year.⁴⁸ But simply because an earth station licensee has at its fingertips dozens of graphs showing an antenna’s gain characteristics does not mean it is not burdensome to have to file that same information every

⁴³ *Id.* at 17.

⁴⁴ *Id.*

⁴⁵ Google Response at 8.

⁴⁶ Verizon Opposition at 2; *see also* WISPA Opposition at 14-15.

⁴⁷ Google’s suggestion that absent annual registration, the Commission “would have to make a series of worst-case estimates regarding satellite operations,” Google Response at 8, ignores the fact that the necessary data is *already on file* at the Commission in the IBFS database.

⁴⁸ *Id.* at 16.

year. Nor is such a requirement consistent with the Commission's obligations pursuant to the Paperwork Reduction Act⁴⁹ to minimize the paperwork burden for regulated entities.

To the extent that the Commission retains any registration requirements for earth stations, it must align the requirements with the FSS regulatory regime. The Commission must explicitly permit receive-only earth stations to register for interference protection.⁵⁰ A procedure for registering newly-licensed earth stations must be put in place, and registration must allow the full range of antenna and azimuth angles reflected in the earth station's license to be reported. Google's suggestion that antenna angle ranges should be limited to those in "actual" use⁵¹ is vague and conflicts with Commission policy. Specifically, the Commission has found that the flexibility to repoint antennas to different satellites is an important element of C-band earth station licensing,⁵² and that flexibility must be maintained.

V. CONCLUSION

For the reasons discussed herein and in the SIA Petition, the Commission should revise the CBRS rules to ensure protection of FSS networks.

Respectfully submitted,

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⁴⁹ 44 U.S.C. § 3501 *et seq.*

⁵⁰ SIA Petition at 20.

⁵¹ Google Response at 7 n.22.

⁵² *See, e.g., FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service*, Second Report and Order, 17 FCC Rcd 2002 (2002) at ¶ 11.

CERTIFICATE OF SERVICE

I hereby certify that on this 29th day of October, 2015, a copy of the foregoing
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