



November 8, 2012

SUBMITTED ELECTRONICALLY VIA IBFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: Ex Parte Presentation in WT Docket No. 12-70, Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands; ET Docket No. 10-142, Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz; and WT Docket No. 04-356, Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands

Dear Ms. Dortch:

By this letter, the United States GPS Industry Council (“USGIC”) responds to the October 25, 2012 *ex parte* presentation of CTIA – The Wireless Association (“CTIA”) in the above-referenced proceedings on the subject of out-of-band emission (“OOBE”) limitations from AWS-4 operations in the 2000-2020 MHz and 2180-2200 MHz bands into the radionavigation-satellite service (“RNSS”) bands below 1610 MHz that are used by the Global Positioning System (“GPS”) and other RNSS systems.¹ The USGIC would like to correct CTIA’s misperception regarding the harmful interference to GPS and RNSS that operation of terrestrial mobile broadband service at the $43 + 10 \log(P)$ dB OOBE emission limit would produce. The Commission was correct to limit OOBE from terrestrial operations of the 2 GHz Mobile-Satellite Service (“2 GHz MSS”) licensees to more protective levels in the past. USGIC and DISH Network Corporation (“DISH”) have agreed that those same limits apply to the AWS-4 operations in the 2000-2200 MHz and 2180-2200 MHz bands.² The Commission should, therefore, condition AWS-4 licenses with the OOBE limits jointly agreed by DISH and the USGIC.

¹ See Letter from Christopher Guttman-McCabe, CTIA Vice President, Regulatory Affairs, to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 12-70, *et al.* (October 25, 2012) (“CTIA Letter”).

² See Joint Letter from DISH Network Corporation and USGIC, WT Docket Nos. 12-70, *et al.* (September 27, 2012) (“DISH/USGIC Joint Submission”).

CTIA's arguments for application of the $43 + 10 \log (P)$ dB default value must be rejected. CTIA's assertion that the $43 + 10 \log (P)$ dB limit that applies to terrestrial mobile broadband services operating in the AWS-1 bands provides adequate protection to GPS because there have been no reports of harmful interference, is inaccurate.³ The reason there have been no reported instances of interference is that terrestrial mobile broadband systems operate at levels substantially below those limits. Indeed, most 3G terminals operate at an OOB limit of -60 dBm/ 3.84 MHz to minimize intersystem and interchannel interference within the wireless service.⁴ This is roughly equivalent to -95.8 dBW/1 MHz, which is actually lower than the value agreed to by DISH and the USGIC in the DISH/USGIC Joint Submission.⁵ In fact, the $43 + 10 \log (P)$ dB limit that CTIA suggests be adopted would allow 40-60 dB more OOB energy into the RNSS band than the OOB level that AWS-1 and other mobile broadband transmitters are producing into the bands used for mobile broadband services.⁶ Sound technical analysis indicates GPS receivers would suffer negative effects if a transmitter were to cause emissions at CTIA's proposed level of $43 + 10 \log (P)$ dB within the RNSS band. For aviation receivers, an industry in which public safety is paramount, technical rules have established receiver immunity limits far below the limits suggested by CTIA.⁷ OOB at the $43 + 10 \log (P)$ level would render such receivers inoperable. The effects on other types of GPS receivers would be similarly adverse. GPS receivers should not be required to tolerate a higher level of interference than mobile handsets, especially when there is no evidence, anecdotal or otherwise, that suggests GPS receivers can tolerate interference at the $43 + 10 \log (P)$ level.

Contrary to CTIA's assertion, OOB into the GPS bands is not a concern that is limited to "directly adjacent spectrum operations"⁸ There are multiple mechanisms that give rise to these unwanted emissions. One such mechanism, transmitted energy that "bleeds through" or is not contained by the transmit filter, is more likely to occur in bands close in frequency to the transmitter, as CTIA states. However, other mechanisms such as local clocks, oscillators, and mixing products inside the transmitter can and do produce spurious emissions in other bands without regard to the proximity in frequency of those bands to the transmitter's band. Modern

³ See CTIA Letter at 1-2.

⁴ See International Telecommunication Union Recommendation ITU-R M.1581-4, Generic unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT 2000 (March 2012).

⁵ See DISH/USGIC Joint Submission, at 1.

⁶ In assessing the acceptability of AWS-4 operations with respect to OOB produced into the GPS bands, the USGIC took full account of the operations of AWS-4 and applicable industry standards – and did not rely on spec-based limits that do not reflect such operations. It is for this reason as well that the USGIC emphasized in its agreement with DISH that the agreement applies only to the AWS-4 bands at 2000-2020 MHz and 2180-2200 MHz, and that "the potential interfering capability of other services should be considered on a case-by-case basis" DISH/USGIC Joint Submission at 1, 2.

⁷ RTCA, DO-229C, Appendix C.2

⁸ CTIA Letter, at 1.

wireless transmitters, such as those used by the mobile broadband industry, include a wide variety and density of electronic components that make such emissions a particular concern to a receive-only, space-based positioning, navigation, and timing system, such as GPS. While there may be technical distinctions between OOB and other types of unwanted emissions (spurious, etc.), the intent of the DISH/USGIC agreement was to protect the RNSS band (1559-1610 MHz) from any OOB. There is clearly a need for OOB (including spurious emissions) limits on AWS-4 operations for the protection of GPS.⁹

CTIA's concern that OOB limits at the levels agreed to by DISH and USGIC (and now applicable to 2 GHz MSS systems' terrestrial components) would be "burdensome" is unsubstantiated.¹⁰ CTIA's members already develop equipment for the wireless bands that meets an OOB limit that equates to -95.8 dBW/MHz. In fact, the shielding that the wireless industry currently employs to meet its own industry standards would likely have the effect of reducing emissions into other bands as well. Therefore, it would not be a burdensome or unreasonable undertaking for CTIA's members to observe the OOB limits proposed by DISH and USGIC to correct any emissions that would cause harmful interference to GPS.

Finally, CTIA wrongly attempts to dismiss the DISH/USGIC Joint Submission as a "commercial agreement" that has no bearing on the regulatory outcome of the above-referenced proceedings. It is United States policy to require the protection of GPS operations.¹¹ OOB from AWS-4 or any other terrestrial mobile broadband operations into the GPS bands at the $43 + 10 \log (P)$ dB level would cause harmful interference to GPS. For these reasons, as USGIC asserted in the October 9, 2012 *ex parte* letter to which CTIA responds, "any statement or uncorrected inference that the "default" OOB level proposed in the notice of proposed rule making in the above-referenced proceedings is somehow appropriate for or protective of GPS would be unacceptable." Contrary to CTIA's suggestion, the USGIC did not ask in the October 9 letter for codification of the OOB values agreed to in the DISH/USGIC Joint Submission. Instead, the USGIC asserted that the forthcoming AWS-4 report and order must include reference to the OOB values agreed to by DISH and the USGIC, and that the resulting AWS-4 authorizations must reflect that AWS-4 operations will be subject to OOB limits in the DISH/USGIC agreement for AWS-4. The Commission has consistently issued terrestrial licenses in the MSS bands conditioned on compliance with the OOB limits agreed to by the USGIC and the MSS operators. To begin departing from such an approach here would be contrary to historical precedent and wholly unjustified.

⁹ Taken to its logical conclusion, CTIA's focus on adjacent bands would render even the $43 + 10 \log (P)$ dB OOB limit unnecessary for AWS-4 operations. The fact that CTIA concedes that some OOB limitation is needed for protection of the GPS bands confirms that mere separation in frequency is not by itself a mitigation against harmful OOB interference to GPS.

¹⁰ See CTIA Letter, at 1.

¹¹ See National Space Policy of the United States of America, at 5 (June 28, 2010).

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CTIA's letter seeks to interpose an unnecessary and dangerous objection to the request for OOB limits applicable only to the AWS-4 licenses that DISH and the USGIC advanced in their September 27, 2012 Joint Submission. The USGIC urges the Commission to reject CTIA's views.

Please direct any questions regarding the foregoing to me.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "F. Michael Swiek", with a long horizontal stroke extending to the left.

F. Michael Swiek
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