WILTSHIRE & GRANNIS LLP

October 22, 2013

Ex Parte

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

Re: Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, ET Docket No. 13-49

Dear Ms. Dortch:

On September 27, 2013, Ken Baker and Dirk Grunwald of the University of Colorado at Boulder, Joe Attanasio of Comcast Corporation, Rob Alderfer of CableLabs, and I spoke via telephone with Mark Settle, Karen Rackley, Aole Wilkins, Navid Golshahi, and Bryant Wellman of the Office of Engineering and Technology ("OET") about the above-referenced proceeding. We discussed the study written by Messrs. Alderfer, Grunwald, and Baker, ("Alderfer *et al*.") attached to the July 24, 2013 reply comments of the National Cable & Telecommunications Association ("NCTA") in this docket.

Specifically, we discussed the expression for the satellite system carrier-to-noise ratio ("C/N_o") contained in Section 4.2.2. of the study, which provides the signal level expression. Mr. Baker explained that the C/N method is a widely used expression of satellite system performance, and communications system performance more broadly. For example, in *Satellite Communications*, Pratt, Bostian and Allnutt ("Pratt *et al*.") note that "C/N has been widely used, and is easier [than previous methods] to apply."[1] In addition, Mr. Baker noted that the Pratt *et al*. textbook predicts results that are nearly identical to the C/N method used in Alderfer *et al*. Specifically, Pratt *et al*. note that, "For two C/N values: If one C/N value is 20 dB or more greater than the other C/N value, the overall C/No is equal to the smaller of the two C/N values within the accuracy of decibel calculations (plus or minus 0.1 dB)."[2] The Alderfer *et al*. study produced this result, and further showed that in the Globalstar system, where the downlink is the limiting link, significant noise can be added to the uplink without impacting overall system performance to a significant degree.

We also explained that the 4.45 dB reduction in C/N on the uplink referenced in the Alderfer *et al*. study is the result of the authors' sensitivity analysis. The study tested the level of Wi-Fi access point expansion associated with a marginal change of 0.1 dB in the Globalstar

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[1] Timothy Pratt *et al.*, *Satellite Communications* (2d. ed. 2003).

[2] *Id.*

system C/N. The authors chose 0.1 dB as the basis of this analysis because it is commonly understood by wireless network engineers to be an extremely small change in signal level, and therefore a very conservative starting point for the analysis. Pratt *et al*. support this view, noting that the margin of error for decibel calculations is plus or minus 0.1 dB. Therefore, by modeling an increase of just 0.1 dB to the Globalstar system due to Wi-Fi activity, the Alderfer *et al*. study bases its analysis on an amount so small that it is within the margin of error for determining system signal strength.

Finally, we discussed how the Alderfer *et al*. study incorporates the 4.45 dB figure, focusing on Figure 4-11 in the study. Figure 4-11 shows the translation from 4.45 dB uplink PFD delta to numbers of Wi-Fi access points at different operating parameters. The paper calculates the power density of a Wi-Fi access point under different deployment scenarios to determine the number of access points that would be required to raise the uplink noise level in Globalstar's system by 4.45 dB (and therefore the very small 0.1 dB noise increase in the C/N_o), accounting for relevant parameters of Wi-Fi and the Globalstar system, including Wi-Fi duty cycles and gain, and Globalstar's orbital height and channel bandwidth. We noted that this model assumes that Wi-Fi access points operate at the full transmit power allowed in each scenario, and, for outdoor deployment scenarios, that all access points are positioned outdoors. This makes the analysis very conservative. Most access points will be indoors, even if the rules allow for outdoor use, and many access points will operate below maximum allowed power, particularly if the rules enable 1 W. For this reason, the output of the model does not show the actual number of Wi-Fi access points that could operate without any harmful interference to Globalstar, but instead demonstrates that even with very conservative assumptions, the number is extremely high, and that no special protection measures are warranted for Globalstar's system.

Pursuant to the Commission's rules, a copy of this notice is being filed electronically in the above-referenced docket.[3] If you require any additional information please contact the undersigned.

Sincerely,

Paul Margie
Counsel for NCTA

cc: meeting participants

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[3] This ex parte notice is timely filed. *See* Federal Communications Commission, Public Notice, *Revised Filing Deadlines Following Resumption Of Normal Commission Operations*, DA 13-2025, at 2 (Oct. 17, 2013) (filings that would have been due on October 1, 2013 but for the government shutdown are due on October 22, 2013).