June 25, 2015

VIA ELECTRONIC FILING

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

Re: *Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, and Amendment of Part 74 of the Commission's Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap* (ET Docket No. 14-165)*; Promoting Spectrum Access for Wireless Microphone Operations* (GN Docket No. 14-166); *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions* (GN Docket No. 12-268)

Dear Ms. Dortch,

On Tuesday, June 23, 2015, CTIA – The Wireless Association® ("CTIA") and its members met with representatives from the Incentive Auction Task Force, the Wireless Telecommunications Bureau ("WTB"), and the Office of Engineering and Technology ("OET") to discuss the above referenced proceedings. A list of the attendees and a copy of the presentation discussed are included as attachments to this *ex parte* filing. In this meeting, CTIA explained that the incentive auction represents a once-in-a-lifetime opportunity for the Commission to make available much-needed spectrum for mobile broadband use and noted the wireless industry's willingness to invest in spectrum rights so long as those spectrum rights are afforded the interference protections mandated by Congress in the 2012 Spectrum Act.

While CTIA has consistently supported rules that both maximize repurposing spectrum for licensed exclusive use in the 600 MHz band and provide for non-interfering unlicensed operations, CTIA stressed the importance that certainty has for potential bidders in the forward auction and reiterated that the current proposals concerning interference protections for licensed 600 MHz operations threaten to undermine the success of the incentive auction. In particular, and as detailed in the attached presentation, CTIA highlighted the real-world testing results of V-COMM which demonstrate that the Commission's proposed technical rules for unlicensed operations in the 600 MHz guard bands and duplex gap would result in harmful interference to licensed services in violation of the Spectrum Act. To provide the necessary and statutorily-defined rights for 600 MHz licensees, CTIA reiterated the need for the Commission to increase out-of-band emission and frequency separation as outlined in V-COMM's report. Finally, CTIA expressed its commitment to work with the Commission to implement technical rules for unlicensed 600 MHz operations in a manner that complies with the Spectrum Act, protects licensed services from harmful interference, and creates a framework that will facilitate a successful auction.

Pursuant to Section 1.1206 of the Commission's rules, 47 C.F.R. § 1.1206, this letter is being electronically filed via ECFS. Please direct any questions to the undersigned.

Sincerely,

/s/ Krista L. Witanowski

Krista L. Witanowski
AVP, Regulatory Affairs
CTIA – The Wireless Association®

Attachment
June 23, 2015 Meeting Participants

CTIA – The Wireless Association®
Scott Bergmann, Vice President, Regulatory Affairs, CTIA
Brian Josef, Assistant Vice President, Regulatory Affairs, CTIA
Krista Witanowski, Assistant Vice President, Regulatory Affairs, CTIA
Thomas Dombrowsky, Senior Engineering Advisor, Wiley Rein LLP (for CTIA)

CTIA Member Company Representatives
Brian Benison, AT&T
Alex Starr, AT&T
Angela DeMahy, AT&T
Richard Engelman, Sprint
Grant Spellmeyer, US Cellular
Robert Morse, Verizon

Federal Communications Commission – Incentive Auction Task Force
Gary Epstein

Federal Communications Commission – Office of Engineering and Technology
Julius Knapp
Ira Keltz
Geraldine Matise
Paul Murray
Rodney Small
Serey Thai
Hugh Van Tuyl

Federal Communications Commission – Wireless Telecommunications Bureau
John Leibovitz
John Schauble
Stephen Buenzow
Chris Andes
Simon Banyai

Unlicensed Operations in the 600 MHz Band
ET Docket Nos. 14-165 and 14-166

June 23, 2015

Overview

- Bidders in the Forward Auction Require Certainty To Invest in New Spectrum Rights in the Critically Important 600 MHz Band.
- The Commission is Required by the Spectrum Act to Protect Licensed 600 MHz Services from Harmful Interference Caused by Unlicensed Use of the Guard Bands.
  - The FCC's Current Proposals for the 600 MHz Spectrum Fail to Account for the Statutorily Protected Rights of 600 MHz Licensees.
  - Real-world Testing Demonstrates That the Commission's Proposed Rules for Unlicensed Operations Will Result in Harmful Interference to Licensed Wireless Services in Violation of the Spectrum Act.
  - White Space Proponents Misunderstand LTE Technical Characteristics and Testing Parameters and Have Provided Unsound Test Data.
- The Commission Can Make Adjustments to its Proposals That Will Protect Licensed Wireless Operations and Bring its Rules into Compliance with the Spectrum Act.

Forward Auction Participants Require Certainty To Invest

- The wireless industry has consistently demonstrated its ability to make significant investments in mobile broadband spectrum when provided certainty about the rights gained in the auction process.
- The Commission is under Congressional mandates to protect licensed 600 MHz services and to ensure that bidding in the forward auction covers the cost of the "incentives" for the reverse auction.
  - By adopting rules that fulfill the Spectrum Act's mandate that unlicensed operations not cause interference to licensed 600 MHz services, the Commission will empower the wireless industry to invest with greater confidence, promoting the success of the incentive auction and the public interest.
  - The 600 MHz band presents novel challenges for bidders in the forward auction. For example, wireless bidders will, for the first time, be bidding on "generic" licenses rather than specific blocks.
  - Adopting rules that place licensed frequencies at a risk of harmful interference would significantly exacerbate the uncertainty for forward auction bidders.

The Spectrum Act Requires Protection from Harmful Interference

- The Spectrum Act emphasizes that the "Commission may not permit any use of a guard band that the Commission determines would cause harmful interference to licensed services."
  - Therefore, in accordance with the Spectrum Act, unlicensed operations in the 600 MHz guard band and duplex gap can only be introduced through a regulatory framework that ensures that such operations do not raise harmful interference concerns.
- The FCC's current proposals for the 600 MHz spectrum band fail to balance the statutorily protected rights of licensees.
- Real-world testing demonstrates that the Commission's proposed rules for unlicensed operations will result in harmful interference to licensed wireless services in violation of the Spectrum Act.
- White Space proponents misunderstand LTE technical characteristics and testing parameters and have provided unsound test data.

V-COMM's Testing Assumptions Are Consistent With Past Precedent and Industry Standards

- V-COMM assumed a 1 dB "desense" interference threshold to protect licensed LTE receivers. This 1 dB desense interference threshold equates to an interference-to-noise ("I/N") protection ratio of -6 dB, which has been accepted and used by the Commission in its most recent efforts to model interference.
  - In particular, the AWS-3 (1755-1780 MHz) and 3550-3650 MHz spectrum bands were analyzed by NTIA and its advisory committees to model the interference effects from potential LTE use of these spectrum bands and used the same -6 dB interference-to-noise protection ratio.
  - This protection level has been repeatedly accepted by the Commission and NTIA, and there is no reason for the Commission not to use this metric here in protecting licensed 600 MHz services from harmful interference caused by secondary unlicensed operations.

V-COMM's Testing Assumptions Are Consistent With Past Precedent and Industry Standards (cont.)

- Additionally, the protection ratio assumed by V-COMM in its testing and endorsed by the Commission in past proceedings is not the most conservative approach to interference protection found in the Commission's rules.
  - The interference protection afforded to DTV service at the edge of a station's noise-limited service area is equivalent to an interference-to-noise ratio of -7 dB.
  - And the Commission has proposed a zero percent interference threshold for television broadcasters which is also much more stringent than the parameters utilized by V-COMM in its testing.
- There is no basis for the Commission to not apply the same protection requirements in the 600 MHz band as it has utilized in the AWS-3 and 3.5 GHz contexts, especially in light of the extremely conservative protections it has provided broadcast television stations.

Recommendations Based Upon V-COMM Test Findings

- More Stringent OOBE Requirements Are Needed To Protect Licensed Services
  - OOBE was found to be the predominant interference effect once appropriate buffers between wireless microphone/white space device operations and licensed LTE services were utilized.
  - The Commission's proposed -56.8 dBm/100 kHz OOBE attenuation requirement must be increased to -89 dBm/100 kHz at band edge to fully protect licensed downlink services in the 600 MHz band.
  - Should the FCC adopt its -56.8 dBm/100 kHz OOBE limit, LTE devices will suffer harmful interference as much as 20 meters away.
- Duplex Gap and Guard Band Requirements Must Be Modified To Protect Licensed Services
  - The OOBE limit must be -89 dBm/100 kHz at the downlink band edge.
  - White space devices and wireless microphones must be placed appropriately distant spectrally from licensed downlinks in accordance with the V-COMM testing results.

FCC Proposals Would Result in Harmful Interference

- The degradation caused by wireless microphones and unlicensed white space devices under the Commission's proposed framework plainly is "harmful interference" in violation of the Spectrum Act.
  - The Commission has generally based its finding of harmful interference on whether the introduction of a new use and/or service would disrupt the users of incumbent services.
  - V-COMM's testing showed that licensed 600 MHz services would be seriously degraded, obstructed, and repeatedly interfered with under regular conditions.
  - Specifically, the 1 dB desensitization of an LTE receiver would result in a 14 percent loss in network coverage area and a 10-15 percent loss in throughput.

Unlicensed Proponents Fail to Understand LTE and Have Provided Flawed Testing Data

- Google has provided "test" results seeking to affirm its position that white space devices can protect licensed 600 MHz services from harmful interference.
  - The two "tests" performed were completed in an unrealistic fashion.
  - The propagation losses assumed by V-COMM were based on 3GPP standards figures that were an *average* of countless numbers of repeated testing configurations – not a *single* test setup. Google's showing that a single instance could lead to higher propagation losses is meaningless and does not account for the many other instances where propagation losses will be significantly *less* than their particular setup.
  - The "operating LTE network" test was simply not rigorous and not able to be replicated by any other party. Google commissioned a consulting engineer to test a single device in a residential basement. A single device tested in this environment, as was true of the propagation loss testing done by Google, does not override the testing of ten different LTE devices in an environment that allowed for detailed measurements of the effects of interference.

The Commission Can Make Adjustments to its Proposals That Will Protect Licensed Wireless Operations

- The Commission should adopt protections to eliminate harmful interference.
  - The Commission should adopt more stringent OOBE limits.
  - The Commission should provide appropriate frequency buffers in the duplex gap and guard bands to separate licensed downlinks and white spaces devices/wireless microphones.
- Absent taking these needed steps to protect 600 MHz licensees from harmful interference, the Commission should list the 600 MHz spectrum affected by use of the guard bands and duplex gap as impaired in the forward auction.
- Additionally, the Commission should make clear that if its proposed interference protections do not fully protect licensed 600 MHz operations, white space devices/wireless microphones will be required to immediately cease transmissions, in accordance with the Spectrum Act requirements.