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October 25, 2012

VIA ELECTRONIC DELIVERY

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Room TWA325
Washington, DC 20554

Re: Notice of *Ex Parte* Presentations
WT Docket No. 12-69

Dear Ms. Dortch:

Using Band 12 devices in lieu of Band 17 devices will not cause harmful interference to consumers. AT&T's latest submission to the contrary prepared by Jeffrey Reed and Nishith Tripathi simply is not credible. Their analysis lacks rigor and incorporates unreliable and previously refuted data.[1] Reed and Tripathi did not perform any original testing of their own; instead, they used unreliable laboratory data that real-world engineering studies and analyses have consistently refuted. Furthermore, they selectively misinterpreted and ignored critical elements of the V-Comm study. In response to the exhaustive field measurements and laboratory tests that the proponents of interoperability have submitted, Reed and Tripathi offer four arguments against interoperability. None of these assertions are persuasive, several of their statements are false, and at least one of their claims actually *supports* restoring interoperability in the 700 MHz band.

First, Reed and Tripathi claim that V-Comm did not document the LTE downlink signal level in its successful tests. This statement is false. The V-Comm study documented the device performance at four LTE downlink signal levels: 1 dB, 3 dB, 10 dB and 30 dB above sensitivity.[2] Beyond falsely concluding that the V-Comm study lacked documentation of the LTE downlink's signal levels, Reed and Tripathi also attempted to challenge the V-Comm test results by suggesting that interoperability testing should have also addressed the highly implausible scenario in which an LTE device located deep inside of a building receives the weakest possible LTE signal of less than 1 dB above sensitivity while in the presence of an exceptionally strong Channel 51 signal. An operational LTE system simply does not

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[1] *See* Jeffrey H. Reed & Nishith D. Tripathi, *Analysis of the V-COMM Report Estimating the Impact of Channel 51 and E Block Interference on Band 12 and Band 17 User Equipment Receivers*, filed with Ex Parte Letter from David L. Lawson, Sidley Austin LLP, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 12-69 (Oct. 3, 2012) ("*Reed & Tripathi Comments*"). The white paper critiqued the reply comments of V-Comm, LLC, filed on July 13, 2012, and provided a new test report prepared by the testing laboratory 7Layers.

[2] *See* Reply Comments of V-Comm, LLC, WT Docket No. 12-69 ¶ 24 (filed July 13, 2012) ("*V-Comm Study*") ("For each test, data was taken for 1 dB (worst-case), 3 dB, 10dB, and 30 dB rise in noise floor to see how the impact changes as the desired signal is increased.").

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experience such weak downlink signals in areas where the DTV signal is as strong as that generated in the lab testing.[3] And yet, contrary to Reed and Tripathi's claims, V-Comm's data captures even this highly implausible scenario, although the V-Comm study did not attempt to draw conclusions around this or other similar theoretical engineering scenarios because they lack any grounding in real-world network implementations.[4]

Second, Reed and Tripathi claim that the interoperability proponents' successful Waterloo field measurements do not establish a minimum separation distance between Channel 51 and Band 12 operations. This statement is irrelevant. The purpose of the Waterloo field measurements was not to demonstrate minimum separation distances, but rather to establish that Band 12 devices already operate near Channel 51 markets today without experiencing harmful interference. Other record evidence that Reed and Tripathi choose to ignore, such as extensive laboratory measurements of commercial Band 12 devices and field measurements in the near-vicinity of Channel 51 broadcast stations, establishes the robust performance of commercial devices in close proximity to Channel 51.[5]

Third, Reed and Tripathi imply that V-Comm used a propagation model that understates interference risk. This implication is false. V-Comm employed the TM 91-1 model to estimate the ground-level signal density from E Block towers.[6] Reed and Tripathi imply that TM 91-1 underestimates ground-level signals, making interference less likely than would actually exist. In truth, the TM 91-1 *overestimates* ground-level signals, making interference seem more likely, a fact that further supports the rigor of the V-Comm study and the strength of its conclusions. The path loss predicted by other propagation models that Reed and Tripathi claim they prefer, such as Okumura-Hata, would actually show *greater* loss and weaker on-the-ground signals—precisely the opposite of what Reed and Tripathi presumably want to see.[7]

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[3] *See* Ex Parte Letter from Christopher J. Termini, Hogan Lovells US LLP, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 12-69 at 1 (Oct. 10, 2012).

[4] V-Comm provided a series of plots that show the Y-axis with the noise rise indicated, running from 0 to 30 dB. The X-axis recorded the DTV signal level at the UE antenna for each measurement point of LTE downlink signal. *See, e.g., V-Comm Study* at 10 (Figures 2-3). A radiofrequency engineer examining the V-Comm figure would conclude that the LTE downlink signal is represented by the Y-axis. The 0 dB starting point corresponded to the device sensitivity as measured and reported in Table 2. Each dB above 0 dB corresponded to an increase in the desired LTE signal level. Thus, the figure conveys the LTE signal level necessary to deliver the target performance level in the presence of the DTV signal level shown in the X-axis.

[5] *Id.* ¶ 56.

[6] Reed and Tripathi argue that the TM 91-1 model employed by V-Comm was inappropriate because the model was not designed for antenna heights above 300 feet and does not contain a frequency-dependent propagation term. *Reed & Tripathi Comments* at 18 ("These more sophisticated models confirm that the TM 91-1 model's simplistic assumptions greatly miscalculate the path loss. As just one example, the Okumura-Hata model uses a frequency-dependent path loss term equal to 26.16*log10(fc), where fc is the carrier frequency in MHz. The difference in path loss between 218 MHz and 850 MHz is 26.16*log(850/218) = 15 dB, which is quite significant. The TM 91-1 model, however, assumes that the path loss would be the same for these frequencies.").

[7] Regardless of the theoretical methodology employed, there is no need to rely upon propagation models to estimate the ground-level signals near E Block broadcast towers. The Hyslop-Kolodzy report provided complete measurements of the signal levels from E Block towers throughout Atlanta. *See* Doug Hyslop & Paul Kolodzy, *Lower 700 MHz Test Report: Laboratory and Field Testing of LTE Performance Near Lower E*

Fourth, Reed and Tripathi assert that the number of resource blocks employed by the devices in V-Comm's Channel 51 test somehow skewed the test results. This assertion is false, too. Few can dispute that the width of user equipment (UE) transmission bandwidth affects the width of the intermodulation product: the wider the UE transmission, the wider the intermodulation signal bandwidth. In drawing conclusions, Reed and Tripathi ignore the successful Hyslop-Kolodzy report results on the narrower UE bandwidth used in that study. Furthermore, Reed and Tripathi ignore AT&T's curious decision not to replicate the V-Comm configuration of a twenty-four resource block transmission, and overlook a far more plausible reason for the differential: AT&T's highly suspect decision not to use a band-rejection filter to eliminate the SFE-100 signal generator noise.[8] In all likelihood, AT&T's decision to use an unfiltered signal generator, which subverts the test by creating a base level of unwanted interference, caused the degraded performance that 7Layers observed, not the use of a wider UE bandwidth.[9] In this case, as in so many others that Reed and Tripathi have tried to conjure, the simplest explanation for the discrepancy – namely, AT&T's curious and largely undocumented test configuration – is the most plausible one.

Block and Channel 51 Broadcast Stations 19-43 (Apr. 11, 2012), filed with Ex Parte Letter from Nash Neyland, *et al.*, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 12-69 (May 29, 2012). Moreover, the Qualcomm MediaFLO signal levels provided in Qualcomm's comments agreed closely with the Atlanta measurements. *See* Comments of Qualcomm Incorporated, WT Docket No. 12-69 (filed June 1, 2012). When compared with the commercial device blocking performance as documented in the Hyslop-Kolodzy and V-Comm reports, the record evidence shows no risk of interference to Band 12 devices in an operational LTE market.

[8] V-Comm correctly noted that the extraordinarily weak LTE signals under observation could be impacted by the DTV signal generator out-of-band emissions. Both the Hyslop-Kolodzy and V-Comm test configurations adequately filtered the signal generator output to remove this erroneous source of interference, and notably, the test results from these two reports are in agreement. Notably, however, 7Layers tested only one Band 12 device and did not appear to filter the SFE-100 signal generator.

[9] Furthermore, the 7Layers test procedure incorrectly defined the device sensitivity. As noted on page 8 of the 7Layers report, the device under test failed the throughput requirement at an LTE downlink signal level of -101.3 dBm. *Reed & Tripathi Comments*, Exhibit A at 8. Therefore, the device sensitivity should have been recorded as the last measurement which did not exceed the threshold, which was -100.8 dBm. However, the following test of Channel 51 impact to a device operating at sensitivity, on page 9, left the downlink LTE signal at -101.3 dBm, the level which already failed with no DTV 51 signal present. *Id.* at 9. Since the device began the DTV 51 test already in failure, it is no surprise that the device continued to fail for all DTV 51 signal levels applied in this test. Reed and Tripathi's claim that a device receiving an LTE signal at sensitivity would be impacted by a DTV signal level of -50 dBm is false because the test was executed incorrectly. The 7Layers test should have set the LTE downlink signal level to the actual device sensitivity of -100.8 dBm, a non-failing signal level, prior to executing the first DTV test. The remaining two data sets, with LTE signal levels of -98.3 dBm and -95.3 dBm, are suspect given the incomplete documentation of the test setup and the apparent lack of a filter in front of the SFE-100 signal generator. *Id.* at 10-11.

Pursuant to Section 1.1206(b) of the Commission's rules, I am filing this notice electronically in the above-referenced dockets. Please contact me directly with any questions.

Respectfully submitted,

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