

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
Washington D.C. 20554**

In the Matter of)	
)	
Unlicensed Operation in the TV Broadcast Bands)	ET Docket No. 04-186
)	
)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band)	ET Docket No. 02-380
)	

OPPOSITION TO PETITIONS FOR RECONSIDERATION

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SUMMARY

Shure opposes the several Petitions for Reconsideration that urge the Commission to roll back wireless microphone interference protections in the newly adopted rules, or, alternatively, argue for broader operating rights that would, if adopted, lead to significant interference to wireless microphone operations. After a lengthy and complicated proceeding with multiple rounds of testing, the Order represents a carefully constructed substantial set of rules that aims to protect incumbent radio operations from interference while still allowing new devices to operate on the TV frequencies. Shure objects to the petitions that rehash old arguments and attempt to deconstruct the Order and rebuild it bit-by-bit in a way that would, if adopted, produce a result wholly inconsistent with the Commission's decision and its carefully crafted noninterference policies. Shure also opposes efforts to use the reconsideration process to put forward radical new proposals far beyond the scope of the Notices and record of this proceeding.

Shure urges the Commission not to roll back critical protections for wireless microphones and to reject never before contemplated schemes to introduce high-powered unlicensed devices into the TV frequencies. Specifically, the Commission should:

- Not eliminate the requirement for TV band devices ("TVBD") to use spectrum sensing to avoid interfering with wireless microphone operations. Spectrum sensing remains a critical protection for important wireless microphone operations and must be retained and strengthened.
- Not relax the -114 dBm sensing threshold for protection of wireless microphones. No party has put forth any credible justification for relaxing the threshold that was the subject of significant support from TVBD proponents for much of the proceeding. If any adjustment to the sensing threshold is to be made, Shure urges the Commission to strengthen the standard to ensure that TVBDs accurately sense

their environment in real-world conditions.

- Retain the requirement for directly linked devices to use distributed sensing. No petitioner provided justification to eliminate the only viable solution to mitigate the “hidden node” problem. While not a complete solution, requiring directly linked devices to share and respond to sensing data significantly improves the likelihood that a “hidden” incumbent will be successfully detected by TVBDs in proximity and thus is a central feature of effective spectrum sensing.
- Reject proposals to increase actual or effective power levels for TVBDs. Such proposals pose grave interference risks to incumbent wireless microphone operations. The interference range of transmitting TVBDs is already disproportionate to the protections provided for in the Order. Increasing the output of personal/portable or fixed TVBDs will render these protections completely ineffective.
- Deny the request to allow in-motion, high-powered TVBDs. Such radical operations are not contemplated in the Order, were not part of the Notices or record, and will create massive interference for wireless microphones and other incumbents.
- Reject the request to eliminate exempt channels in markets where public safety radios operate on channels between 14-20 or to eliminate the rule prohibiting TVBDs from operating on adjacent channels below Channel 21. Although these rules protect relatively small amounts of spectrum, some of which may not in fact be occupied by other services, the rules provide an important opportunity for

wireless microphones to operate free from TVBD interference.

- Deny requests to permit personal/portable operations below Channel 21. This rule should not be subject to reconsideration as it was adopted years ago in the First Report and Order in this proceeding. In any event, no credible reason has been offered in support of this proposed material change in rules that would pose significant interference risks for wireless microphones.
- Reject proposals to restrict the open and transparent process adopted for evaluating and certifying spectrum sensing devices. Public participation will add significant value to the evaluation process and such limiting proposals are wholly inconsistent with the Commission's renewed emphasis on encouraging open and transparent procedures that allow stakeholders full participation in this critical process.

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OPPOSITION TO PETITIONS FOR RECONSIDERATION

Shure Incorporated (“Shure”), by its undersigned counsel and pursuant to Section 1.429 of the Commission’s Rules, 47 C.F.R. § 1.429, hereby respectfully submits this consolidated Opposition to the Petitions for Reconsideration, identified herein,¹ of the Commission’s Second Report and Order in the above-captioned docket released on November 14, 2008 (“Order”).²

Seventeen (17) petitions for reconsideration in all were filed seeking changes to the Commission’s order. Several of these urge the Commission to roll back wireless microphone interference protections in the newly adopted rules;³ others argue for broader operating rights that would, if adopted, lead to significant interference to wireless microphone operations.⁴ For

¹ See *Petition for Reconsideration of Adaptrum, Inc.*, ET Docket No. 04-186 (Mar. 18, 2009) (“*Adaptrum Petition*”); *Petition for Reconsideration of the Public Interest Spectrum Coalition (“PISC”)*, ET Docket No 04-186 (Mar. 19, 2009) (“*PISC Petition*”); *Petition for Reconsideration of Dell, Inc. and Microsoft Corp.*, ET Docket No. 04-186 (Mar. 19, 2009) (“*Dell/Microsoft Petition*”); *Petition for Reconsideration and Clarification Motorola, Inc.*, ET Docket No. 04-186 (Mar. 19, 2009) (“*Motorola Petition*”); and *Petition for Reconsideration of the Wireless Internet Service Providers Association (“WISPA”)*, ET Docket No. 04-186 (Mar. 19, 2009) (“*WISPA Petition*”).

² See *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807 at ¶ 258 (2008) (“*Order*”).

³ See, e.g., *PISC Petition* at 17-19 (PISC seeks to eliminate two (2) reserved channels centered around Channel 37 in specific markets where public safety radios occupy channels between 470-512 MHz).

⁴ See, e.g., *Motorola Petition* at 15-19 (Motorola seeks 40-fold increase in personal/portable output to 4 W).

the reasons discussed below, none of these requests has merit and therefore the Commission should deny such petitions.

I. The Commission Should Reject Attempts to Eliminate or Dramatically Reduce Interference Protections for Wireless Microphones

Shure opposes those Petitions that urge the Commission to abandon or weaken the protections that the Commission so diligently put in place to safeguard wireless microphones from interference caused by new television band devices (“TVBDs”) operating in the TV frequencies. The Commission has made clear from the beginning that its aim was to consider allowing new devices to operate in the TV bands as long as the new operations would not cause interference to incumbent operations.⁵ The Order represents a carefully constructed substantial set of rules that aims to protect incumbent radio operations from interference while still allowing new devices to operate on the TV frequencies. Nonetheless, some petitioners attempt to deconstruct the Commission’s Order and rebuild it bit-by-bit in a way that produces a result wholly inconsistent with the Commission’s decision and its noninterference policies.⁶ These proposed changes, most of which have been debated at length on the record prior to release of the Order, if adopted, would result in rules that do not adequately protect wireless microphones

⁵ “Our goal in this proceeding is to allow [unlicensed] devices to operate on unused television channels in locations where such operations will not result in harmful interference to TV and other authorized services.” *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, First Report and Order and Further Notice of Proposed Rule Making, 21 FCC Rcd 12266 at ¶ 1 (2006) (“*First Report & Order*”)

⁶ In support of securing spectrum for specific products -- both existing and hoped for -- various parties attack the requirement for spectrum sensing, the sensing level (*Adaptrum Petition* at 2, *Dell/Microsoft Petition* at 2-4, *Motorola Petition* at 12), the availability of geolocation database protection to all wireless microphones (*Adaptrum Petition* at 3), the power levels (*Adaptrum Petition* at 4-6, *Motorola Petition* at 15-19, *PISC Petition* at 10-12), the operational rules for adjacent channels (*Motorola Petition* at 20-21), the designation of 210 MHz for portable device operations (*Dell/Microsoft Petition* at 5-6, *PISC Petition* at 6-9, *Motorola Petition* at 11), the height requirements for fixed systems (*Motorola Petition* at 3-5, *WISPA Petition* at 7-9, 13-15) distributed sensing requirements (*Motorola Petition* at 14, *WISPA Petition* at 12-13), the limit on TVBD operations in two channels in 13 markets (where PLMRS operates in channels 14-21) (*PISC Petition* at 17-19) and the rigorous proof-of-performance testing requirements for sensing devices. (*PISC Petition* at 19-22).

from interference. As Shure and others pointed out in other Petitions for Reconsideration, the Commission achieved much of what it set out to do but the Order falls short in certain respects of providing necessary interference protections and should be revised in several important ways.

Some proponents of new TVBDs, apparently emboldened by having secured a reasonable means for new devices to operate in the TV bands, are now pressing the Commission to make radical changes in the order, superseding many of the protections put in place to safeguard incumbents. As discussed in detail below in Sections II through VI, these parties rehash many of the same demands and arguments that have been the subject of protracted proceedings leading up to the Order. It is well-settled that a reconsideration petition is not a process to re-argue points that the Commission earlier fully considered and upon which it has already ruled.⁷

In some cases, TVBD proponents raise new proposals in their petitions that fall outside the scope of the Notices and record of this proceeding. As such, these proposals are not appropriate for the Commission to entertain upon reconsideration.⁸ Examples of this include Motorola's effort to remodel the rules to permit vehicle mounted portable devices to operate in

⁷ Section 1.429 (b)(1) of the rules specifies that a petition for reconsideration must rely upon facts not previously presented that have occurred or changed since the last opportunity to file or facts that were previously unknown to the petitioner. 47 C.F.R. § 1.429(b)(1). *See Implementation of the Satellite Home View Improvement Act of 1999*, Order on Reconsideration, 17 FCC Rcd 27875, ¶ 3 (2002) (“Reconsideration of a Commission decision is warranted only if the petitioner cites a material error of the fact or law, or presents additional facts and circumstances that raise substantial or material questions of fact that were not considered and that otherwise warrant Commission review of its prior action. The Commission will not reconsider arguments that have already been considered.”) (*citing Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act: Part 73 Definition and Measurement of Signals of Grade B Intensity*, Order on Reconsideration, 14 FCC Rcd 17373 (1999); *Elimination of Telephone Company-Cable Cross Ownership Rules*, Sections 63.54-63.56, for Rural Areas, 91 FCC 2d 622 (1982); *Amendment of Section 73.636(a) of the Commission's Rules (Multiple Ownership of Television Stations)*, 82 FCC 2d 329 (1980)).

⁸ These proposals are simply not covered by the Notices issued in this proceeding, were not part of the testing, or otherwise part of the extensive record developed in this docket. A court's analysis of adequate notice under Section 553(b)(3) of Title 5 of the United States Code provides for the modification of the proposed rule if the final rule is a logical result of the proposal and record. “In applying this provision [5 U.S.C. § 553], we have held that the notice requirement is satisfied as long as the content of the agency's final rule is a logical outgrowth of its rulemaking proposal. The focus of the logical outgrowth test, we have added, is whether ... [the party] *ex ante*, should have anticipated such a requirement might be imposed.” *Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428, 445-46 (D.C. Cir. 1991)(internal quotation marks and citations omitted). As discussed, herein, the proposals put forth by Dell/Microsoft, Motorola, WISPA and others do not meet this test.

motion at high powers,⁹ Motorola's bid essentially to reallocate TV band frequencies to the licensed Part 90 services,¹⁰ as well as WISPA's and other petitioners' requests to increase permissible power levels dramatically.¹¹ These proposals raise significant new issues that have not been fully considered in this proceeding. If those parties want to pursue these new proposals, they should separately submit a petition for rulemaking as required under the Commission's Rules and the Administrative Procedures Act¹² with the necessary justification for the proposed rule change rather than trying to make material changes to the scheme adopted in this proceeding on reconsideration. Consistent with the purpose of the rulemaking requirements, this would allow the Commission and interested parties the full opportunity to evaluate whether the proposed rule changes would serve the public interest.

II. Shure Opposes Requests to Eliminate or Relax the Sensing Requirements

Several Petitioners -- Adaptrum, Dell/Microsoft, and Motorola, PISC, and WISPA -- take direct aim at the spectrum sensing requirement and urge the Commission to eliminate it altogether with respect to wireless microphones. This request is mind boggling since most of these parties spent years assuring the Commission, Congress and others that sensing technologies will protect wireless microphones from interference and that it is imperative that the Commission permit TVBD to incorporate spectrum sensing protections. TVBD proponents present no

⁹ See *Motorola Petition* at 17.

¹⁰ *Id.* at 18 (Motorola argues that parties eligible for Part 90 licenses should be allowed to operate TVBDs from in-motion vehicles).

¹¹ See *WISPA Petition* at 15-16. WISPA previously argued for increased power levels, but it was solely in the context of a *licensed* regime, where TVBDs and TVBD licensees would have been subject to greater FCC oversight. See *e.g.*, Ex Parte Presentation of WISPA, ET Docket No. 04-186, 2-10 (filed Oct. 28, 2008).

¹² Pursuant to the Administrative Procedure Act and the Commission's Rules, the Commission is required to publish the "terms or substance of [a] proposed rule" for comment. 5 U.S.C. § 553(b)(3); 47 C.F.R. § 1.413(c). Comment has not been sought on in-motion TVBD operations or high-powered, unlicensed use of broadcast television spectrum.

persuasive evidence why the Commission should now reverse this key part of the interference protection scheme.

A. The Spectrum Sensing Requirement Must be Retained and Strengthened

As Shure outlined in its Petition for Reconsideration, spectrum sensing is an important part of the overall interference protection scheme developed to protect incumbents. Dell/Microsoft and PISC argue that TVBD devices with access to the Database should not be required to incorporate sensing for wireless microphones. Dell/Microsoft specifically claim that incorporating spectrum sensing for wireless microphones will raise the cost of consumer products.

They, along with Adaptrum, also argue that wireless microphone protection should be limited to the Database as a means of “distinguishing” between those wireless microphones that they view as warranting interference protection and those that, in their view, do not.¹³ Adaptrum also argues that eliminating the sensing requirement is warranted because no wireless microphone test procedure has been specified.¹⁴ PISC argues that “less reliable” sensing data should not be permitted to override permission from the Database.¹⁵ Motorola and PISC contend that the Commission should now change the rules to eliminate any requirement for TVBDs to sense wireless microphones.¹⁶ Motorola claims that microphones can be protected by

¹³ See *Dell/Microsoft Petition* at 4; See also *Adaptrum Petition* at 2-3. Adaptrum also argues that the “safe harbor” channels will adequately accommodate more dynamic wireless microphone operations and that the Commission should resurrect and adopt the beacon concept. Shure opposes both ideas. As reiterated here and set forth by Shure and others elsewhere in the record, the two “safe harbor” channels designated in thirteen markets are not sufficient spectrum to support itinerant wireless microphone operators in many localities and any additional available channels free from TVBD-interference is not assured and highly unpredictable.

¹⁴ See *Adaptrum Petition* at 3.

¹⁵ See *PISC Petition* at 5-6. Shure similarly opposes the beacon proposal that PISC resurrects. *Id.* at 9. As detailed at length on the record, the beacon proposal being offered will not provide reliable protection and will itself make the scarcity of spectrum in the “white spaces” worse by consuming a significant amount of spectrum. See, e.g., Ex Parte Presentation of Shure Incorporated, ET Docket No. 04-186 at 2 (filed Oct. 2, 2008).

¹⁶ See *Motorola Petition* at 8-11; see also *PISC Petition* at 6-9.

expanding the two channels where TVBD's will not operate on a market by market basis nationwide.¹⁷ Generally, TVBD device proponents argue, without offering any justification, either that sensing for wireless microphones is too difficult to develop or that it is too expensive to incorporate into TVBDs.¹⁸ While they previously stated that sensing technology was "mature technology" and ready to implement, Dell/Microsoft now assert that engineering a TVBD that senses accurately to -114 dBm will "require significant time and expense"¹⁹ and other protections will suffice.

These requests should be rejected because they ignore the fact that wireless microphone are inherently dynamic and portable. Spectrum sensing is necessary to protect those wireless microphones operating in a manner that makes registration in the Database impractical. Many microphone operations -- used in broadcasting, entertainment, moviemaking and other enterprises -- are often itinerant with equipment being deployed to respond to immediate needs with little opportunity for advance planning or Database registration. Further, in the many situations where advance registration in the Database will not be a practical solution, the small bits of disparate spectrum that *may* be TVBD-free²⁰ are not adequate or sufficiently predictable to support itinerant operation. Instead of rolling back the obligation to implement spectrum sensing, Shure recommends that the Commission flesh out the sensing obligation with certain

¹⁷ See *Motorola Petition* at 9-11. At the same time, Motorola presses for rules changes that would allow portable devices throughout the band, including on adjacent channels, between channels 2-51 (except channel 37) thus eliminating another means of protecting wireless microphone from interference.

¹⁸ See *Dell/Microsoft Petition* at 4; see also *Motorola Petition* at 13 (stating that its own technology proved "unreliable" at sensing wireless microphones, and acknowledging that it has no solution to prevent spurious emissions from triggering TVBD false detections).

¹⁹ See *Dell/Microsoft Petition* at 4.

²⁰ TVBDs are not permitted to operate on adjacent channels in channels 2-21, Channel 37, and in two channels above Channel 21 to be identified in 13 markets where channels 14-21 are occupied by public safety. The Commission's rules do not preclude TV, Part 90 or other spectrum users from occupying channels 5-20 in any market.

specific requirements aimed at ensuring, as much as possible, the efficacy of sensing in both hybrid and sensing-only TVBD devices.²¹

Shure also opposes the request by Dell/Microsoft that if the FCC decides to retain the sensing obligations, it should only require a -107 dBm threshold.²² Notably, the White Spaces Coalition of which Motorola and Dell are vocal members, proposed the -114 MHz standard and for years in this proceeding argued the appropriateness of this measure.²³ In an unexplained turnabout, and certainly with no new evidence to demonstrate that the sensing level adopted by the Commission is inapt, Microsoft and Dell now recant their strongly held prior position and urge the Commission to greatly relax the requirement.

Dell/Microsoft's bid to allow personal/portable devices operating at 100 mW to enjoy a threshold even more relaxed than the -107 dBm is also meritless. For the first time, White Spaces Coalition members Microsoft and Dell ask the Commission to implement a "dB-for-dB compensation" for lower-power white space operations, increasing the level at which wireless microphones would need to be sensed commensurate with the decrease in power of the TVBD transmission.²⁴ Given that a TVBD transmitting with much less than 100 mW of output will radiate far beyond its -107 dBm sensing range, any proposed dB-for-dB compensation is meaningless. Shure believes that there is good reason to tighten up the sensing threshold -- not

²¹ See *Petition for Reconsideration of Shure Incorporated*, ET Docket No. 04-186, 14-18 (Mar. 19, 2009) ("*Shure Petition*") (urging the Commission to ensure that sensing technology works in the presence of strong, real-world signals and to implement toughened behavioral standards to mitigate incidents of interference).

²² See *Dell/Microsoft Petition* at 4.

²³ See *Id.* at 5; see also Ex Parte Presentation of Philips Electronics North America, ET Docket No. 04-186 (filed Aug. 29, 2007) (White Spaces Coalition member Philips asserts that it has developed a device that "enables reliable (*i.e.* 100 percent) detection of a wireless microphone signal at a level of -116 dBm or better throughout a television channel").

²⁴ See *Dell/Microsoft Petition* at 5.

relax it -- and, similar to SBE, recommends that the Commission revise the threshold to -126 dBm.²⁵

B. Distributed Sensing is a Critical Interference Protection Feature and Must be Retained

Shure urges the Commission to retain distributed sensing as a mandatory obligation for hybrid and sensing-only devices that are directly linked or linked through a common base station. The Commission properly concluded that distributed sensing will “improve the ability of unlicensed TVBDs to detect the signals of [incumbents],...[and] better enable [TVBDs] to avoid using occupied channels when they are located in hidden nodes or areas where there are signal nulls.”²⁶ This conclusion was based on extensive record evidence demonstrating that a single sensing TVBD does not offer incumbents -- in particular itinerant incumbents -- adequate interference protection.²⁷ Networked devices, operating with a far more comprehensive understanding of the ambient RF environment, will be more likely to identify and avoid incumbent signals that may be partially shielded or “hidden” from a single TVBD. The decision to mandate distributed sensing reflects sound engineering judgment well supported by the record and no party has offered any persuasive justification for eliminating this important feature.²⁸

The concerns voiced by WISPA and Motorola that distributed sensing may somehow limit the utility of broadcast television spectrum for TVBD operations are inaccurate and not

²⁵ See *Shure Petition* at 15-17; see also *Petition for Reconsideration of the Society of Broadcast Engineers, Inc.*, ET Docket No. 04-186, 24 (Mar. 19, 2009) (“*SBE Petition*”).

²⁶ *Order* at ¶ 249.

²⁷ The Commission’s own battery of tests determined that TVBD prototypes sensing in isolation were unreliable in real-world environments and prone to missing microphones lightly shielded by manmade or natural structures. See, e.g., Evaluation of the Performance of Prototype TV-Band White Space Devices Phase II, Technical Research Branch Laboratory Division Office of Engineering and Technology, Federal Communications Commission, OET Report FCC/OET 08-TR-1005 at pp. 19-22 (Oct. 15, 2008) (“*Phase II Report*”). A cluster of networked TVBDs conducting scans from different positions around a Part 74 wireless microphones increases the probability that at least one device will successfully detect the incumbent.

²⁸ Motorola now asserts that its technology cannot distinguish between spurious emissions and protected Part 74 wireless microphones. See *Motorola Petition* at 13.

supported by the record. WISPA expresses concern that distributed sensing may “result in [an] entire network being shut down.”²⁹ This assertion is patently untrue. Rural WISPs will have access to multiple clean channels. Detection of a wireless microphone by a remote customer or base station will simply necessitate a quick hop to another channel with no perceptible disruption to a WISP’s underlying customers. Motorola offers no technical demonstration or evidence to support its assertion that distributed sensing will harm TVBD performance. Motorola’s concerns are in fact less about distributed sensing and more about the fact that its equipment design preference does not include sensing at all. For example, Motorola claims that false detections of other non-TVBD Part 15 devices may result in a networked device powering down.³⁰ A design flaw that prevents a TVBD from properly distinguishing incumbent users of broadcast television spectrum from other devices, however, is wholly unrelated to distributed sensing, and certainly not justification to eliminate the obligation.

III. The Commission Should Reject Proposals to Increase Actual or Effective Power Levels

Several proponents filed petitions boldly seeking increased TVBD power levels, including several requests urging the Commission to adopt levels dramatically exceeding what has been previously proposed or considered in this lengthy proceeding. Given that even a slight increase in TVBD power levels -- let alone the radical increases suggested by certain proponents -- will render the interference protections the Commission has implemented for wireless microphones completely ineffective, Shure urges the Commission to reject these requests.

²⁹ *WISPA Petition* at 12.

³⁰ *See Motorola Petition* at 15.

A. *Increasing TVBD Power Levels Will Render Interference Protections for Wireless Microphones Meaningless*

The existing protections for wireless microphones under the Commission's Rules have no margin and cannot tolerate even a nominal increase in TVBD power levels. In fact, the record in this proceeding is replete with evidence that the power levels the Commission has adopted must be *decreased* in order to provide meaningful protection for higher-priority wireless microphone users.³¹ Wireless microphones that are registered in the Database under the current rules are only entitled to a single kilometer of protection,³² leaving them vulnerable to interference from 4 W fixed TVBDs up to several kilometers away and any 100 mW personal/portable TVBD radiating in close proximity to the protective zone. Itinerant microphones that are not registered in the Database are susceptible to interference from any TVBD that fails to sense the microphones' comparatively weaker signal.

Despite the overwhelming record evidence demonstrating that existing power levels will result in instances of interference for higher-priority wireless microphone users, and that increased power levels would create massive interference, several TVBD proponents have taken this opportunity to request generous increases in power. Motorola remarkably argues that the Commission should change its rules to permit in-motion, vehicle mounted TVBDs that transmit at high speeds with 4 W of effective radiated power.³³ Even assuming that in-motion, vehicle mounted operations are contemplated *at all* under the TVBD rules -- which they are not -- a request to authorize such fast moving, high-power TVBD operations is well beyond the scope of

³¹ The interference radius of a 100 mW transmitter extends 2.4 km, yet under ideal conditions a -114 dBm TVBD's effective sensing radius extends only 1.2 km. *See Shure Ex Parte Presentation*, ET Docket No. 04-186, 11-17 (filed Jun. 13, 2007).

³² *See* 47 C.F.R. § 15.712(f)(1) ("TVBDs will not be permitted to operate within 1 km of the coordinates of registered wireless microphone sites...").

³³ *See Motorola Petition* at 15-19.

this reconsideration particularly in light of the potential for interference that this proposal raises.³⁴ In-motion 4 W TVBDs would create interference in a radius extending several kilometers from the transmitting vehicle, far beyond the one kilometer of protection entitled to a wireless microphone under the current rules.³⁵ Despite the obvious interference threat its newly proposed, high-power TVBDs would create, Motorola offers no alternative or enhanced protections for wireless microphones. Moreover, given that Motorola asserts that it cannot engineer a TVBD capable of detecting wireless microphones, sensing technology fails to represent even a secondary interference protection against in-motion TVBDs.

The Commission should reject Motorola's new proposal. If Motorola wanted the Commission and interested parties to seriously contemplate 4 W, in-motion TVBDs, it had ample opportunity to introduce the concept at various points during this nearly six year proceeding.³⁶ The public did not have adequate notice of this proposal and the Commission should not allow Motorola to use the reconsideration process as a backdoor means of authorizing radical, high-power unlicensed devices, for which the Commission never sought or received comments.

³⁴ Both hybrid and sensing-only TVBDs must sense their environment for 30 seconds prior to transmitting. *See* 47 C.F.R. § 15.711(c)(2)-(3). An in-motion, vehicle mounted TVBD cannot satisfy this obligation while moving even at slow speeds, let alone at speeds of up to 70 kilometers an hour as proposed by Motorola. Motorola fails to recognize the distinction between a "nomadic" device that is transportable but fixed while in use, and an "in-motion" device designed to transmit from a moving vehicle.

³⁵ With its antenna mounted at three meters, a 4W EIRP signal from a TVBD will propagate for approximately three (3) kilometers before it is attenuated to -115 dBm and incapable of interfering with a wireless microphone, assuming 140 dB of path loss between the TVBD and a rack mounted Part 74 microphone receiver.

³⁶ While Motorola previously mentioned mounting TVBDs on utility vehicles, it only contemplated use when the vehicle was parked. *See, e.g.*, Ex Parte Presentation of Motorola, ET Docket No. 04-186, 6 (filed Apr. 24, 2007) (stating that vehicle mounted TVBDs would be "temporary fixed" transmitters designed to be used while the vehicles are parked.)

The Commission should similarly reject the proposal to allow 20 W fixed TVBD transmitters.³⁷ No studies or tests have been conducted to determine the potential impact of operations at such high power levels, and there is a significant risk of harmful interference to all incumbent users with TVBDs operating with such dramatic levels of output. In particular, allowing fixed TVBDs to operate with 20 W of effective radiated power would create an enormous imbalance between the protections entitled to wireless microphones and the interference range of the transmitting TVBD. TVBDs radiating with 20 W of effective power would have the potential to degrade or disrupt wireless microphones operating up to seven kilometers in the distance, far beyond the modest one kilometer zone of protection entitled to a registered microphone.³⁸ Such high power operations are wholly inconsistent with the principals of Part 15. Given the enormous interference range, even 20 W TVBDs operating in rural environments would present a significant interference threat to incumbents and should not be given further consideration.

Both Adaptrum and PISC argue for increased output levels for personal/portable devices. While PISC fails to specify exactly how much additional power it desires, Adaptrum argues for raising the output for hybrid personal/portable TVBDs to 250 mW and the output for sensing-only TVBDs to 100 mW, both of which would then operate at powers significantly higher than what was contemplated by the Commission.³⁹ The record in this proceeding is replete with analyses of the adverse impact of higher power personal/portable TVBDs on much lower power

³⁷ See *WISPA Petition* at 15.

³⁸ Based on Recommendation ITU-R P.1546-3 (2007), applying a base station height of 30M and a receiving antenna height of 2M, with a base station ERP of 20W spread uniformly across the TV channel.

³⁹ See *Adaptrum Petition* at 4-6.

wireless microphones (as well as incumbent services in the broadcast television bands).⁴⁰ Most wireless microphones operate at 10-20 mW.⁴¹ Lower power wireless microphones have been the norm for decades for most uses in order to achieve significant frequency reuse to support ever increasing demand for wireless microphones in many industries.⁴² Lower wireless microphone power also reflects battery design limitations as well as typical reduction in power due to body absorption.⁴³

Permitting personal/portable TVBDs to radiate with 10 to 25 times the power of incumbent, higher-priority microphones would create widespread interference for both registered and itinerant microphones. Specifically, increasing the output of personal/portable devices would create an interference range that dramatically exceeds the sensing range of a properly functioning TVBD that detects incumbent signals accurately at -114 dBm. Further, a 100-250 mW TVBD would radiate with enough power to interfere with a registered microphone if the TVBD is in close proximity to the microphone's protective zone and its emissions are not attenuated sufficiently before reaching the microphone receiver.

B. Increased Power Levels Requested by Motorola and Others are Patently Inconsistent and Irreconcilable with Part 15 Rules

Despite what Motorola and the other petitioners that request more output power might wrongly assert, TVBDs are not primary or secondary users of broadcast television spectrum.

⁴⁰ See, e.g., *Phase II Report* at 35 (describing the ability of a prototype TVBD radiating at ~150 mW EIRP to create interference for cable TV infrastructure from “significant separation distances”); see also *Shure Ex Presentation*, ET Docket No. 04-186 (filed Dec. 13, 2006) (demonstrating effects of co-channel interference on Part 74 microphones from a simulated TVBD).

⁴¹ FCC rules permit wireless microphones to operate at powers up to 250 mw. See *Comments of Shure Incorporated*, ET Docket No. 04-186, 7-8 (filed Nov. 30, 2004) (“*Shure 2004 Comments*”).

⁴² *Id.*

⁴³ *Id.*

TVBDs are instead unlicensed devices authorized under Part 15 that must be operated in a manner that ensures “no harmful interference is caused” to higher-priority users.⁴⁴

Any Part 15 TVBD that transmits with power levels exceeding the radius of protection guaranteed to higher-priority incumbents cannot reconcile its operations with the above mandate. As described above, under the current rules there is already an imbalance between the interference range of fixed and personal/portable TVBDs and the protections enumerated for incumbents.⁴⁵ Accordingly, if there is to be any adjustment made in the output level of TVBDs it should be a *reduction* to restore equilibrium, *not* a dramatic increase in power that ensures widespread interference and diminished utility of the spectrum.

IV. No Technical or Policy Reason Justifies Eliminating TVBD Exempt Channels or Permitting First Adjacent TVBD Operations Below Channel 21

The Commission should reject PISC’s request to eliminate the two exempt channels allocated in 13 markets to protect wireless microphone operations.⁴⁶ PISC’s arguments overestimate the quantity and quality of available broadcast television spectrum for wireless microphone operations, and fail to recognize the importance and public benefits of microphones, which would be left without any meaningful protection from TVBD interference in several large metropolitan areas without the above exempt channels. In fact, given the widespread

⁴⁴ 47 C.F.R. § 15.5. The Commission has repeatedly emphasized that “[u]nder Part 15, radio equipment is permitted to operate without a license on frequencies allocated to authorized radio services so long as the operation does not cause harmful interference to the authorized services.” *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License - Sensormatic Petition for Reconsideration*, Memorandum, Opinion and Order, 5 FCC Rcd 3492, 3493 (1990).

⁴⁵ Shure, along with NCTA, SBE and CBA requested in separate petitions elaborated on the imbalance between incumbent protections and TVBD interference, and urged the Commission to reduce TVBD power levels. *See Shure Petition* at 13-14; *see also Petition for Reconsideration and Clarification of the National Cable & Telecommunications Association* (“NCTA”), ET Docket No. 04-186, 4-5 (Mar. 19, 2009) (“*NCTA Petition*”); *Petition for Reconsideration of the Community Broadcasters Association* (“CBA”), ET Docket No. 04-186, 3 (Mar. 19, 2009) (“*CBA Petition*”); *SBE Petition* at 2.

⁴⁶ Exempt channels are actually only available in 11 markets. Part 90 operations have never been coordinated in Cleveland and Detroit, and do not occupy channels between 14-20 in those markets.

deployment and public benefits of itinerant, nomadic wireless microphones, and the lack of a viable interference protection mechanism for this critical class of microphone user, the two channels the Commission has made TVBD exempt are less than optimal and should be expanded.

PISC wrongly asserts that the Commission has excluded TVBD operations “from fully 16 channels (96 MHz of bandwidth) in order” to protect wireless microphone operations.⁴⁷ To the contrary, Channels 5 through 20 are largely unavailable to wireless microphone users because they are occupied by television broadcasting stations. Further, the long wavelengths in Channels 5 through 13 (in the VHF band) are inhospitable to low-gain wireless microphone antennas.⁴⁸ In the metropolitan areas where additional channels are carved out for public safety operations, there will be a nominal and wholly insufficient number of channels below Channel 21 available for wireless microphone use that do not fall within the contour of a broadcast television or on a channel allocated for public safety.⁴⁹ In these cities, itinerant microphone users are expected to congregate almost exclusively on the TVBD exempt channels centered around Channel 37. In particular, given that Database registration and spectrum sensing offer them no meaningful protection from oblivious fixed TVBDs, the roving news crews deployed in and around these metropolitan areas are likely to rely on these channels.

While grossly overstating the amount of spectrum exempt from TVBD operations and available for wireless microphone use, PISC attempts to diminish the public benefits conveyed by wireless microphones by suggesting that there are “a small number of licensed microphone

⁴⁷ See *PISC Petition* at 17.

⁴⁸ See *Shure 2004 Comments* at 19 (explaining how “ambient noise and antenna efficiency” limit use of VHF spectrum).

⁴⁹ For example, in Washington where channels 14 and 15 are occupied by land mobile/public safety radios, only two open UHF channels will be available to wireless microphones below Channel 21 after the DTV transition.

uses” that will make “highly inefficient use of the spectrum.”⁵⁰ In making this unsupported assertion, PISC fails to recognize that an individual FCC call sign can authorize the licensee to operate hundreds of individual microphones,⁵¹ overlooks that itinerant news crews affiliated with AM, FM, TV and International broadcast stations may operate wireless microphones without a separate license,⁵² and ignores that the Commission has already acknowledged “the important function that wireless microphones serve and [found] it in the public interest to preserve” broadcast television channels for their use whether they are licensed or unlicensed.⁵³

Given the limited spectrum available and importance of itinerant wireless microphones, an expansion of TVBD exempt channels is appropriate and justified, not an elimination or reduction of these channels. Shure and others have previously urged the Commission to exempt TVBD operations from a minimum of six (6) channels centered around Channel 37, and this remains the minimum amount of interference free spectrum needed to support itinerant users.⁵⁴

For similar reasons, the Commission should reject proposals to permit fixed TVBD operations on adjacent channels below Channel 21.⁵⁵ The wireless microphone industry has been subject to great change and upheaval over the past five years, primarily because of the uncertainty created by the underlying proceeding and the recent proceeding in ET Docket 08-166, which proposes an immediate ban on wireless microphone operations in the 700 MHz

⁵⁰ See *PISC Petition* at 17-18.

⁵¹ For example, Call Sign WPTB331 authorizes the use of 600 individual microphones.

⁵² See 47 C.F.R. § 74.24.

⁵³ See *Order* at ¶ 151.

⁵⁴ See *Shure Ex Parte Presentation*, ET Docket No. 04-186, 6 (filed Sep. 25, 2008); see also *Association for Maximum Service Television, Inc. (“MSTV”) Ex Parte Presentation*, ET Docket No. 04-186 (filed Oct. 9, 2008).

⁵⁵ See *Dell/Microsoft Petition* at 5; see also *Motorola Petition* at 11.

band.⁵⁶ While channels below Channel 21 are not optimal and significant changes in equipment design may be required to use those frequencies, the adjacent channel rule in the Order is a critical protection for wireless microphones (as well as television broadcasters and other higher priority incumbents). The adjacent channel rule protects TV from high powered fixed TVBD operations while offering wireless microphones some opportunity for operation without the threat of interference from TVBDs. Finally, the evidence in the record is extensive with respect to interference risks associated with TVBD adjacent channel operations to both wireless microphones and TV broadcasts.⁵⁷

V. No Technical or Policy Reason Justifies a Change in the Rule Limiting Personal/Portable TVBD Operations to Channels Above Channel 21

Dell/Microsoft and Motorola, all of which previously argued against personal/portable TVBD operations outside UHF Channels 21-51, have without justification reversed course and asked the Commission to open television broadcast frequencies below Channel 21 for personal/portable unlicensed use.⁵⁸ The Commission correctly determined in 2006 that frequencies below Channel 21 should remain off-limits to personal/portable TVBDs.⁵⁹ To the extent that Petitioners seek to overturn this decision, the Commission should dismiss their Petition for Reconsideration as an untimely challenge to the First Report and Order. Shure urges the Commission to reject this reckless proposed change in the rules that would dramatically

⁵⁶ See *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band*, Notice of Proposed Rulemaking, FCC 08-188 (2008). The FCC defines the “700 MHz” band as 698-806 MHz. See *Id.* at ¶ 1.

⁵⁷ See, e.g., *Phase II Report* at 26. During FCC adjacent channel tests TVBD prototypes lost up to 74 dB of sensitivity when a simulated DTV signal occupied the first adjacent channel. The Commission itself concluded that “moderate-to-strong DTV signals... adjacent to the detection channel can significantly degrade detection capability.”

⁵⁸ See *Moto Petition* at 11; *Dell/Microsoft Petition* at 5.

⁵⁹ *First Report & Order* at ¶ 21 (“We will also exclude personal/portable [TVBDs] from operating on channels 14-21 in all areas of the country to prevent possible interference to public safety and other operations”)

heighten the risk of harmful TVBD interference to higher priority incumbents below Channel 21.⁶⁰

A. *Extensive Evidence in the Record Demonstrates that Personal/Portable TVBDs Cannot Protect Incumbents While Operating Below Channel 21*

The Commission properly evaluated the heightened threat personal/portable TVBDs present to incumbents in channels below Channel 21 and aptly decided to “prohibit personal/portable TV band devices from operating on [these] channels in all areas of the country.”⁶¹ This conclusion is reinforced by the FCC’s laboratory and field testing, which demonstrated that TVBDs were unable to effectively detect incumbent signals.⁶² In particular, in real-world environments, even when the TVBDs under test were equipped with large, efficient antennas, the Commission found that they could not reliably detect incumbent signals. Given that the small, low-gain antennas on personal/portable devices will be far less effective at sensing the longer wavelengths in the lower UHF and VHF frequencies below Channel 21, the Commission should avoid introducing personal/portable TVBDs into such spectrum.⁶³

Introducing personal/portable devices below Channel 21 would also require TVBDs to detect and avoid higher priority incumbents with new and completely different RF signatures that resemble neither a television broadcast nor wireless microphone. Whereas a television broadcast occupies a full 6 MHz channel and wireless microphones occupy 200 kHz channels, a Part 90 radio operating between 470 and 512 MHz in the lower UHF only occupies a narrow 25

⁶⁰ *Id.*

⁶¹ *Id.* (emphasis added).

⁶² *See, e.g., Phase II Report* at 26 (reporting the inability of TVBD prototypes to detect incumbents in real-world environments).

⁶³ For example, the wavelength in the VHF High Band TV channels (7-13) is approximately 3 times longer than at 600 MHz, the middle of the core UHF TV band. This longer wavelength makes it very difficult to design small antennas that can operate efficiently over the broad range of frequencies encompassed by one or more TV channels, making it very difficult to achieve the sensitivity necessary to detect incumbent users reliably.

kHz channel and licensees in these bands are already migrating to equipment that will occupy even narrower 12.5 kHz channels.⁶⁴ There is no evidence in the record to suggest that TVBDs will be able to successfully detect these narrow signals. Not a single test has been conducted with TVBDs sensing for Part 90 emissions, or, for that matter, has a test even been proposed. Shure is not the only skeptic regarding a TVBD's ability to sense a Part 90 emission, however, Motorola itself previously stated that reliance on spectrum sensing in the 470 to 512 MHz band as an interference protection mechanism would jeopardize critical life-safety communications.⁶⁵

B. Limiting Personal/Portable Operations Below Channel 21 to Hybrid, Database Enabled Devices Does Not Sufficiently Mitigate the Potential for Harmful Interference

As a number of petitioners noted, the Database will be subject to a number of significant operational limitations that may impact its effectiveness, including intentional attempts to hack, spoof or disable it.⁶⁶ Such incidents may disable the Database nationwide, and may go undetected by personal/portable TVBD users for a significant period of time.⁶⁷ Should the Database become compromised for any reason, hybrid devices will pose the same threat as sensing-only TVBDs to all incumbents in frequencies below Channel 21. Neither Dell/Microsoft

⁶⁴ See 47 C.F.R. § 90.203; see also *Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended; Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies*, Third Memorandum Opinion and Order, 19 FCC RCD 25045, ¶ 2 (2004) (“For Public Safety Radio Pool licensees operation PLMR services in the same bands, we also establish a January 1, 2013 deadline for migration to 12.5 kHz technology”).

⁶⁵ See, e.g., *Ex Parte Presentation of Motorola*, ET Docket No. 04-186, 21 (filed Sep. 29, 2004) (“We believe, to protect Public Safety, that no unlicensed operations in channels 14-20 should be considered”); see also *Ex Parte Presentation of Motorola*, ET Docket No. 04-186, 29 (filed Apr. 24, 2007) (“Motorola Recommendations; No unlicensed operations in channels 14-20”).

⁶⁶ See *Petition for Reconsideration of Key Bridge Global LLC (“Key Bridge”)*, ET Docket No. 04-186, 2-3 (Mar. 19, 2009) (“*Key Bridge Petition*”) (discussing a number of security threats to the Database, including incidents where “malicious operators could hijack a legitimate database administrator’s identity via man-in-the-middle attacks (colloquially called a phishing attack), issuing false channel assignments and deliberately cause incumbent interference”); see also *SBE Petition* at 22 (noting that protective measures must be implemented to ensure that “devices can not be ‘hacked’ or ‘spoofed’ by communications from rogue database sources or rogue devices”).

⁶⁷ See, e.g., *Key Bridge Petition* at 3 (noting that a TVBD user would be unable to identify a phantom database).

nor Motorola has proposed an interference avoidance solution that protects incumbents below Channel 21 from personal/portable TVBD interference in the event of a database failure. In fact, although it was not addressed in its petition, Motorola itself previously stated that a “location-specific Database” was incapable of adequately protecting “Public Safety systems [from] accidental interference” in the 470-512 MHz band.⁶⁸ Potentially affected municipalities have also voiced their concerns, noting that databases can be defeated unintentionally.⁶⁹

Given the challenges facing TVBDs in detecting incumbent signals, the unfriendly characteristics of VHF and low-UHF spectrum for personal/portable TVBD use, the limitations of the Database, and the critical need to keep a minimal amount of “known,” clean spectrum available for wireless microphone users, the Commission should deny the request of Dell/Microsoft and Motorola. The Commission made the right decision in 2006 when it prohibited personal/portable use below Channel 21, and the subsequent events transpiring in this proceeding have only served to reinforce the Commission’s original conclusion.

VI. The Commission Should Deny Requests to Eliminate the Requirement to Place Proposed Test Procedures and Methodologies for Sensing Devices on Public Notice and to Diminish Public Participation in the Certification Process

PISC wants to relax the certification process for sensing-only TVBDs by eliminating public comment and observation, and instead wants the Commission to implement a standardized certification process based on the existing record.⁷⁰ Alternatively, if public comment is sought on a case-by-case basis for TVBDs undergoing certification, PISC wants the Commission to release a single Public Notice after receipt of the application and resolve any

⁶⁸ *Ex Parte Presentation of Motorola*, ET Docket No. 04-186, 2 (filed Sep. 29, 2004).

⁶⁹ *See Ex Parte Comments of the County of Los Angeles, California*, ET Docket No. 04-186 (filed Jan. 31, 2007).

⁷⁰ *See PISC Petition* at 20.

issues without subjecting each device to a second round of public scrutiny.⁷¹ Shure disagrees with this plan. The FCC properly concluded that sensing devices must undergo proof-of-performance testing before being certified, and given the challenge of properly evaluating such devices, determined that public comment and participation at several critical junctures would benefit the testing process.⁷² Indeed, given the critical importance of sensing, Shure believes comment and participation in the testing process should be extended to the certification process for hybrid devices as well.⁷³

Thoroughly vetting whether a sensing-only device can detect higher priority incumbent signals with an “extremely high degree of confidence” in real-world environments is a daunting task.⁷⁴ Generally, Commission certification tests serve a straightforward function: confirm that a device under test has an emission that falls within a specified mask. In contrast, TVBD certification tests will assess detection and behavioral capabilities that the FCC has *never* before attempted to qualify on a routine basis. Specifically, these tests will evaluate whether a TVBD accurately senses a wide variety of incumbent signals with EIRP ranging from a full megawatt (DTV broadcast) occupying a 6 MHz channel to a handful of milliwatts (handheld wireless microphones) spread over a narrow 200 kHz channel. Moreover, these tests will need to confirm that detection occurs accurately when the incumbent signals are interleaved amongst each other across a wide swath of spectrum.

⁷¹ See *Id.* at 22.

⁷² See *Order* at ¶ 257 (noting that the poor performance of TVBD prototypes made it “particularly difficult to fully validate the performance of [sensing] technology”).

⁷³ See *Shure Petition* at 15.

⁷⁴ *Order* at ¶ 258.

Shure was heavily involved in FCC laboratory and field tests of TVBD prototypes, and fully grasps the magnitude of this challenge.⁷⁵ It is inherently difficult in a laboratory setting to replicate a real-world environment.⁷⁶ In the field, it is challenging to comprehensively map the ambient signals in the VHF and UHF bands and perform controlled tests, in particular with low-powered incumbents such as wireless microphones.⁷⁷ Field tests also need to be conducted at sufficiently diverse test sites to develop a comprehensive understanding for how a TVBD will react in the different environments it will operate once it is distributed *en masse*.

Given these challenges, public comment/participation on a case-by-case basis is absolutely critical to the success of the TVBD certification process. Public comment/participation will prove invaluable to the Commission in selecting the most apt tests to perform in the laboratory and in identifying field test sites that most closely approximate real-world environments where the sensing-only TVBD under test will operate in close proximity to incumbents. Public comment/participation will also serve as a powerful check to ensure that devices are not introduced before they are ready.⁷⁸ Further, public comment/participation is consistent with renewed emphasis on transparency and participation encouraged by the Chairman and administration.⁷⁹

⁷⁵ Shure representatives were physically present at every laboratory and field test involving detection of wireless microphones, and were present at most tests involving detection of broadcast television signals.

⁷⁶ For example, the need for a separate signal generator limits the number interfering signals.

⁷⁷ For example, at several field test sites it was possible to detect overlapping television broadcasts on a signal channel. This made it impossible to tell what the TVBD prototype actually sensed, to the extent it sensed anything, when it scanned that channel. *See Phase II Report* at C-4.

⁷⁸ TVBD proponents have previously attempted to portray sensing technology as far more advanced than FCC tests demonstrated. *See, e.g., Comments of the White Space Coalition on the OET White Space Device Prototype Testing Report*, ET Docket No. 04-186, 3 (filed Aug. 17, 2007) (Dell, Microsoft and other TVBD proponents stated that the first round FCC tests results “should put to rest lingering claims in this proceeding by some parties about the ability to detect signals as low as -114 dBm as proposed by [Dell/Microsoft]”).

⁷⁹ Chairman Copps has stated that FCC must become “more transparent, open and useful to the stakeholders that we serve.” Acting Chairman Michael Copps, Remarks to the Federal Communications

PISC also grossly overstates the Commission’s ability to cull practical certification tests and procedures from the existing record in this proceeding.⁸⁰ The TVBD proponents have not contributed any meaningful input on how to test pre-production devices. A handful of interested parties have made test recommendations, but these were directed almost exclusively at test practices and methodologies to evaluate basic sensing functionality of prototype devices, not the proof of performance tests that will be needed to qualify whether a “pre-production sample device . . . identical to the device expected to be marketed” will comprehensively detect and protect incumbent users of broadcast television spectrum.⁸¹ Any such recommendations would also be generic in nature, and likely overlook critical use-specific tests that may help the Commission determine the detection and behavioral performance of a particular sensing-only TVBD.⁸²

Finally, it is critical for interested parties to have the opportunity to comment on both the proposed test procedures/methodologies *and* on the ultimate test results. Data generated from a battery of sensing tests is unlikely to yield completely “black or white” results. Input on the results will aid the FCC staff in evaluating whether a device has real-world functionality or is merely a “lab queen” that successfully passes certification tests but will likely cause widespread interference once introduced into the marketplace. Third party input on the test results will also ensure that the Commission receives the full range of views and interpretations of test data and

Commission Staff (Jan. 26, 2009), <http://www.fcc.gov/commissioners/copps/statements2009.html> (last visited May 5, 2009).

⁸⁰ See *PISC Petition* at 20.

⁸¹ *Order* at ¶ 259.

⁸² For example, handheld TVBDs would need to be subjected to tests designed to evaluate whether the body attenuation of the user adversely impacts its sensing performance.

help to counterbalance any pressure that is brought to bear to rush devices through the process before the devices are ready for “prime time.”

Respectfully submitted,

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Dated: May 8, 2009

CERTIFICATE OF SERVICE

I, Timothy L. Bransford, do hereby certify that on this 8th day of May, 2009, I caused a copy of the foregoing "Opposition to Petitions for Reconsideration" to be sent via first-class U.S. Mail, postage prepaid, to the following.

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