

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of )  
 )  
Digital Audio Broadcasting Systems ) MM Docket No. 99-325  
And Their Impact On the Terrestrial Radio )  
Broadcast Service )

To: The Commission

**Reply Comments of National Public Radio, Inc.**

Pursuant to Section 1.415 of the Commission's Rules, 47 C.F.R. § 1.415, National Public Radio, Inc. ("NPR") hereby replies to the comments on the Commission's Public Notice regarding a joint request for an FM In-Band, On-Channel ("IBOC") power increase.<sup>1</sup>

The record in response to the Public Notice, and to date, does not support the proposed 10 percent across-the-board IBOC power increase. NPR, as much as anyone, recognizes the need for and benefits of digital audio broadcasting ("DAB"), having called on the Commission to address the spectrum needs of advanced terrestrial radio systems more than 2 decades ago<sup>2</sup> and having pioneered the multicast use of the HD Radio system.<sup>3</sup> NPR would like nothing better

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<sup>1</sup> Public Notice: Comment Sought on Joint Parties Request for FM Digital Power Increase and Associated Technical Studies, MM Docket 99-325, rel. May 22, 2009 [hereinafter "Public Notice"]. Unless otherwise indicated, all citations to comments are to comments filed in this proceeding in response to the Public Notice.

<sup>2</sup> Comments of National Public Radio, In the Matter of Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, MM Docket No. 87-268, at 2-7, filed Nov. 18, 1987.

<sup>3</sup> See In the Matter of Digital Audio Broadcasting Systems And Their Impact on the Terrestrial Radio Broadcast Service, Second Report and Order, First Order on Reconsideration, and Second Further Notice of Proposed Rulemaking, 22 FCC Rcd. 10344, 10356 (2007). NPR received a "Cool Stuff" award from Radio World for its work establishing the viability of multicasting. Radio World, May 2005.

than to see improved HD Radio coverage to realize the full promise of HD Radio. Based on the technical data NPR has presented, however, improving HD Radio coverage in the proposed manner threatens the analog service on which hundreds of millions of listeners depend.<sup>4</sup>

This is no small matter. The compatibility of HD Radio transmissions with analog service is the defining feature of the IBOC system and the DAB transition. Indeed, as the Public Radio Regional Organizations aptly noted in their comments, the Commission established this principle in the First Report and Order in this proceeding: “We favor the rapid implementation of DAB in a manner that will not disrupt existing service.”<sup>5</sup> Unless the Commission is prepared to revisit the evolutionary approach of transitioning from analog to hybrid analog/digital and, eventually, to a purely digital radio system, the Commission cannot grant the proposed power increase and simply disregard the adverse consequences for analog service.

In response to the Public Notice, the few commenters supporting the proposed blanket power increase have offered no new evidence or basis to justify the proposal. That is a significant omission, particularly given the failure of the prior testing to examine the impact of the proposed increase on analog SCA subcarrier services for the visually impaired and analog host compatibility.<sup>6</sup> On the basis of the current record, we therefore submit, the Commission lacks an adequate basis on which to grant the requested power increase.

Most of the commenters urged the Commission to defer authorizing an IBOC power until

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<sup>4</sup> See Comments of National Public Radio at 2 [hereinafter “NPR Comments”].

<sup>5</sup> See Comments of the Public Radio Regional Organizations at 3 (quoting In the Matter of Digital Audio Broadcasting Systems And Their Impact on the Terrestrial Radio Broadcast Service, First Report and Order, 17 FCC Rcd. 19990, 19993 (2002)) [hereinafter “PRRO Comments”].

<sup>6</sup> The current NPR Labs testing is addressing these matters. See NPR Comments at 5-8.

completion of the NPR Labs-led studies.<sup>7</sup> Many entities, including a number of licensees or other organizations that individually represent hundreds of stations operating throughout the reserved and non-reserved portions of the FM band,<sup>8</sup> submitted comments urging the Commission to defer the power increase matter until the additional testing is completed so that a more individualized power increase methodology can be established.<sup>9</sup> Comments from the broadcast engineering community likewise supported improving HD coverage in a manner that does not harm existing service and urged the Commission to await completion of the current testing.<sup>10</sup> Given the weight and breadth of these comments, authorizing an across-the-board 10 percent IBOC transmission power increase just as the current testing is about to be completed would be contrary to the public interest.

Support for the proposed power increase is generally limited to the comments of iBiquity and the proponents of the proposed power increase and focuses primarily on the need to improve

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<sup>7</sup> 32 of the 41 parties who filed comments urged the Commission to defer any power increase until NPR's technical studies are complete.

<sup>8</sup> See PRRO Comments at 1-4 (representing more than 30 licensees, which together own and operate more than 200 full power broadcast stations); Comments of the University Station Alliance at 1 (representing NCE FM stations licensed to universities, colleges, and state agencies across the country); Comments of Educational Media Foundation at 2 (licensee of more than 200 NCE FM stations); Comments of Calvary Chapel of Twin Falls, Inc. at 1, 3 (licensee of 28 full power NCE FM stations and more than 400 FM translators). NPR itself represents hundreds of licensees that together own or operate in excess of 800 full power FM stations.

<sup>9</sup> See, e.g., PRRO Comments at 3-4 ("With the results of the NPR Labs study a mere two months away, the PRROs do not believe the Commission has a rational basis for moving forward with the Joint Parties request until the NPR study is complete.")

<sup>10</sup> See, e.g., Comments of Cohen, Dippell and Everist at 1-2 ("the Commission as well as industry needs the benefit of comprehensive studies from NPR"); Comments of Cavell, Mertz & Associates, Inc., at 1 ("[T]he Bureau should use all available data on which to base this far-reaching decision, particularly when a large amount of data is expected to be available in a few short months.").

HD Radio coverage -- a proposition no one seriously disputes.<sup>11</sup> NPR has consistently supported increasing IBOC power to accomplish that objective<sup>12</sup> and, in fact, has committed significant resources to achieving a power increase methodology. We are therefore not surprised by anecdotal evidence that a 10 percent IBOC transmission power can materially increase a station's HD Radio coverage area.<sup>13</sup> That increasing IBOC transmission power will improve HD Radio coverage or that such an improvement would be beneficial are not the issue, however. Rather, the question is how best to increase HD Radio coverage while protecting existing analog FM services from harmful interference.

To the extent iBiquity and the Joint Parties even address the significant interference consequences of the proposed blanket power increase, they largely rely on diversionary rhetoric rather than addressing the technical merits of the issue. Thus, these commenters seek to downplay the prospect of adjacent channel analog interference by ascribing to it a "worst case"

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<sup>11</sup> See Comments of Backyard Broadcasting, LLC, Beasley Broadcast Group, Inc., Black Crow Media Group, L.L.C., Bonneville International Corp., Broadcast Electronics, Inc., Broadcaster Traffic Consortium, L.L.C., CBS Radio Inc., Clear Channel Communications, Inc., Commonwealth Broadcasting Corporation, Continental Electronics Corp., Cox Radio, Inc., Emmis Communications Corp., Entercom Communications Corp., Greater Media, Inc., Harris Corporation, Journal Broadcast Corporation, Lincoln Financial Media Company, Nassau Broadcasting Partners, L.P., Nautel Maine Inc., NRG Media, LLC, Sacred Heart University, Inc. at 2-8 [hereinafter "Joint Parties Comments"]; Comments of iBiquity Digital Corporation at 3-5 [hereinafter "iBiquity Comments"]. See also Comments of the National Association of Broadcasters at 3-8.

Although NPR is a member of the Broadcast Traffic Consortium ("BTC"), which, in turn, is a signatory to the Joint Parties Comments, those comments do not necessarily reflect the views of the individual BTC members and they are contrary to NPR's position in this matter.

<sup>12</sup> NPR Comments at 2; Comments of National Public Radio, Inc., MM Docket No. 99-325, at 2-4, filed December 5, 2008.

<sup>13</sup> See Joint Parties Comments, Exhibit A.

scenario of their own devising in which all FM stations simultaneously increase IBOC transmission power by 10 percent.<sup>14</sup> While the Commission cannot make the contrary assumption -- that stations will simply ignore a blanket authorization to increase power -- an assumption that all FM stations will act simultaneously and immediately is not a premise of NPR's prior or current testing<sup>15</sup> or of the interference concerns expressed by many commenters in this proceeding. Indeed, NPR's reply comments in response to the prior Public Notice specifically cited the example of WBUR-FM to show that a 10 percent IBOC power increase by even one 1<sup>st</sup> adjacent station could have significant interference consequences.<sup>16</sup> It should be obvious, but the fact that one can aggregate the data on an industry-wide basis does not mean that the data must be so aggregated to have any relevance.

To underscore the point, however, NPR has reviewed the test data to identify 58 NPR Member stations that would suffer the most severe 1<sup>st</sup> adjacent interference consequences, each from a single 1<sup>st</sup> adjacent station operating at -10 dBC IBOC. We have attached exhibits containing the coverage maps graphically displaying the interference and a table estimating the affected populations for these individual stations.<sup>17</sup> The associated tabulations of population

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<sup>14</sup> See id. at 9; iBiquity Comments at 2.

<sup>15</sup> In stating otherwise, these commenters are either misinformed or being disingenuous.

<sup>16</sup> Reply Comments of National Public Radio, Inc., MM Docket No. 99-325, at 6-7, filed Jan. 12, 2009.

<sup>17</sup> See Exhibit A (tabulation of affected populations) and Exhibit B (terrain-sensitive coverage maps). The population table shows the potentially affected station and its 1<sup>st</sup> adjacent neighbor used in the study. The maps were prepared with the TIREM point-to-point model for each station's licensed facility using 3-arc second interval digital terrain elevation data and a desired-to-undersired ratio of 20 dB, as determined through receiver testing by NPR. The maps are preceded by a table listing the stations studied, the critical 1<sup>st</sup> adjacent station, and within the service contour: the population receiving interference-free service, the population of interference inside the service contour, the total population, and the percentage of population

demonstrate interference effects as high as 57% with an average of 13% for the group. The maps demonstrate that the harm to adjacent analog service does not presume an immediate and simultaneous 10 percent IBOC transmission power increase by all FM stations. The maps also show that interference will vary among stations, which, in turn, underscores why a more individualized approach, rather than an across-the-board 10 dB increase, is required.

Along similar rhetorical lines, the power increase proponents argue that anything short of an immediate power increase authorization will necessitate delaying resolution of the matter well into the future.<sup>18</sup> As NPR represented in its initial comments, however, it will furnish the Commission with full reports upon completion of the testing in early September. While only the Commission can control how quickly it solicits public input, we note that it has entertained 2 rounds of initial and reply comments on this matter in a matter of months. The Commission has thus demonstrated its ability and willingness to act expeditiously. All that it lacks is a sufficient technical basis, which NPR and its industry colleagues will supply in the very near future.

In the purely hypothetical case that the results of the current testing are found to be irrelevant or otherwise useless, deferring the matter by 2 months need only delay resolution of the matter by 2 months, hardly fatal to an otherwise compelling technology. In reality, we and others are convinced the testing will contribute significantly to the DAB transition.<sup>19</sup>

At this time, NPR Labs has already completed extensive field testing with WRNI-FM, channel 274A, Narragansett Pier, RI, in association with WKLB-FM, channel 273B, Waltham,

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predicted to receive interference. Population was enumerated by 2007 U.S. Census blocks.

<sup>18</sup> See iBiquity Comments at 6-7; Joint Parties Comments at 10.

<sup>19</sup> See note <sup>10</sup>, supra. See also iBiquity Comments at 6 ("iBiquity believes those tests should provide the Commission with additional information relevant to its consideration of the 10 dB increase.")

MA and KBPN, channel 202C3, Brainerd, MN, in association with KCRB-FM, channel 203C1, Bemidji, MN. WKLB and KCRB were operated with IBOC transmission powers up to -10 dBc under experimental authorizations. NPR Labs has recorded the mobile reception of WRNI and KBPN inside the service contours of each station with the IBOC transmission powers on the respective 1<sup>st</sup> adjacent stations at -20 dBc, -14 dBc and -10 dBc. The audio recordings produced in this test will be instrumental in documenting the effects of high-power IBOC transmission and in testing perceived impairments with controlled listener tests, scheduled to occur in August as a final part of this study. NPR Labs also has commenced SCA receiver testing with high-power IBOC interference, which will be completed by the end of this month.

Given the imminent conclusion of this important testing, it is difficult to conceive of the Commission rushing to grant the requested increase. Since the testing to date appears to support a power increase methodology based on longstanding distance separations and facility size allocation metrics,<sup>20</sup> moreover, we believe authorizing an IBOC transmission power methodology based on those metrics will be simple to implement and use. Consideration of the test results and adoption of a refined power increase proposal therefore need not materially delay the DAB transition.

Finally, iBiquity and the power increase proponents largely deny the interference that has occurred to date, including at the elevated IBOC power level. As an example of improved HD Radio coverage, for instance, the Joint Parties cite WKLB, Waltham, MA, which has operated at -10 dBc pursuant to an experimental authorization, but they neglect to mention the interference

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<sup>20</sup> See NPR Comments at 6-7.

that 1<sup>st</sup> adjacent station WRNI-FM, Narragansett Pier, RI, has claimed to suffer.<sup>21</sup> Other commenters reported interference at the existing authorized power level.<sup>22</sup> This evidence is significant, since the white noise-like quality of the interference makes it appear as though the analog service is simply too weak to be received properly and not the victim of an adjacent IBOC transmission. Thus, even loyal listeners would not necessarily know to register an interference complaint. These examples of real world interference compel a cautious approach.<sup>23</sup>

The comments support deferring the power increase matter rather than attempting to devise an interim measure, but, if the Commission is determined to act immediately, the only appropriate interim power increase would be one that avoids any additional analog interference.

The overwhelming majority of commenters oppose any Commission action until the current testing is completed, which is the position NPR advocates.<sup>24</sup> If the Commission believes it must act now, NPR's initial comments proposed an approach that would allow many stations to implement significant power increases without causing any additional adjacent analog interference.<sup>25</sup>

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<sup>21</sup> See Joint Parties Comments, Exhibit A. See Reply Comments of Rhode Island Public Radio, MM Docket No. 99-325, filed July 17, 2009. As noted above, NPR's current testing is examining this issue.

<sup>22</sup> See, e.g., Comments of Klein Broadcast Engineering, L.L.C. at 6-7; Comments of Barry D. McLarnon, P.E., at 7; Comments of Daniel Houg, Chief Engineer, KAXE-FM, at 2; Comments of Entravision Holdings, L.L.C. at 3.

<sup>23</sup> This evidence of interference also belies iBiquity's assurance that the existing FM frequency mask provides sufficient interference protection. See iBiquity Comments at 8.

<sup>24</sup> See note <sup>8</sup>, supra.

<sup>25</sup> NPR Comments at 11-14. The formula NPR proposed inadvertently omitted a closing parenthesis. Id. at 14. The corrected formula is as follows: The allowable IBOC power, in dBc,

NPR's proposal would allow any station to increase IBOC power subject to existing minimum protection requirements using contour protection for reserved FM band stations and site spacing according to individual station classes for non-reserved FM band stations. Stations located at greater than minimum spacings would be able to increase IBOC transmission power up to the equivalent level of IBOC interference that minimum spacing between 1<sup>st</sup> adjacent stations would permit. To demonstrate the ease of implementing such an approach, NPR Labs has computed the allowable IBOC powers for all licensed full power FM stations in the United States and has provided a database tool at the NPR Labs website so that anyone can input the call sign of the FM station and "look up" the IBOC transmission power increase under this proposed interim policy.<sup>26</sup>

The interim approach advocated by iBiquity, by contrast, suffers from the same flaws as the increase proposed by the Joint Parties. Such "one size fits all" approaches ignore the distance separations and facility size metrics that underlie existing broadcasting allocations. While authorizing every station to implement a 6 dB IBOC power increase on an interim basis would not pose as great a danger of adjacent analog interference, it could well result in interference for particular pairings of short-spaced stations. iBiquity's justification is limited to its anecdotal observation that a 6 dB increase improved HD Radio coverage in the case of one station and the naked conjecture that "[a] 6 dB increase is attainable for many FM broadcasters with existing transmission equipment and can be put in place relatively quickly in numerous cases." A 4 or 5 dB

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is the maximum of:  $-(20 \text{ dBc} - 60 \text{ dBu} + (\text{IBOC station maximum analog}) \text{ FSI dBu} + 6 \text{ dB})$ . In the example given, if 47 (not 49) dBu is the highest field strength of the 1<sup>st</sup> adjacent IBOC station, the allowable power would be as follows:  $-(20-60+(47+6)) = -13 \text{ dBc}$  (5%).

<sup>26</sup> The proposed IBOC Interim Power Allowance tool is available at [www.nprlabs.org/publications/distribution/interimIBOCpowerallowance/](http://www.nprlabs.org/publications/distribution/interimIBOCpowerallowance/). Technical details on how the station data was generated and how to use the tool are available on the web site.

increase would also satisfy this rationale, but it is anyone's guess why one figure should be chosen over another absent more extensive testing.

If the Commission is determined to implement an interim power increase, only NPR's proposal provides a sound technical and legal basis on which to act.

### **Conclusion**

As set forth more fully herein and in NPR's initial comments, NPR urges the Commission to await the results of the industry testing before approving an IBOC power increase, but, if it must approve an interim increase, the Commission should only adopt the increase proposed by NPR to avoid any additional adjacent analog interference.

Respectfully submitted,

NATIONAL PUBLIC RADIO, INC.



Joyce Slocum

Vice President for Legal Affairs

Michael Riksen

Vice President, Policy & Representation

Michael Starling

Chief Technology Officer and

Executive Director, NPR Labs

John Kean

Senior Technologist

Julie M. Kearney

Director of Public Policy and Legislation

Gregory A. Lewis

Associate General Counsel

635 Massachusetts Avenue, N.W.

Washington, DC 20001

202/513-2040

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