

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554-0001**

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

To: The Commission and Media Bureau

COMMENTS

Jonathan E. Hardis
356 Chestertown St.
Gaithersburg, MD 20878-5724

hardis@alum.mit.edu

December 19, 2011

TABLE OF CONTENTS

I.	Introduction and Abstract.....	1
II.	The Request Lacks Foundation, and Should Be Denied, Because the Elevated Sideband Power Order Itself was Based on Significant Error	3
	A. The <i>Order</i> was Based on Manifest Technical Error	3
	B. The <i>Order</i> is Colored by Repeated, Knowingly False Statements	5
	C. The <i>Order</i> was Adopted Absent Proper Process under the Administrative Procedure Act, Resulting in Additional Error.....	13
	1. Public Comment on the Advanced IBOC Coverage and Compatibility Study (AICCS) is Required	14
	2. The AICCS Proves that Elevated Digital Powers Create Harmful Interference.....	18
	3. NPR Put Their Private Interest Before the Public Interest	20
	D. The <i>Order</i> was Adopted in Clear Contravention of the Commission’s Rules	22
	E. The <i>Order</i> is not yet Administratively Final	23
III.	The Commission Should Clarify the Allowance for Elevated Sidebands, if Allowed	25
IV.	The Commission Should Adopt a Complete Technical Standard	28
V.	Conclusion	31

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554-0001**

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

To: The Commission and Media Bureau

COMMENTS

I. INTRODUCTION AND ABSTRACT

1. My name is Jonathan E. Hardis, and I offer these comments in response to Public Notice DA 11-1832, “Comment Sought on Request for FM Asymmetric Sideband Operation and Associated Technical Studies,” of November 1, 2011.¹ I offer these comments as an individual and as a daily listener to the broadcast radio service.

2. Earlier on this Docket, I filed an Application for Review² of Media Bureau’s Order DA 10-208, adopted January 27, 2010,³ which was the initial rule allowing increased digital power and upon which the present proposal seeks to build. No decision on the *Application for Review* has yet been reached. For the avoidance of doubt, nothing in these comments should interfere with consideration of the *Application for Review* or be interpreted to supersede the *Application for Review* and associated pleadings.

¹ See http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-11-1832A1.pdf.

See also [76 FR 72885-72888](http://www.fcc.gov), November 28, 2011.

² Application for Review of Jonathan E. Hardis (“*Application for Review*”), April 8, 2010, MM Docket No. 99-325; at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020408278>.

³ 25 FCC Rcd 1182, [DA 10-208](http://www.fcc.gov), Adopted January 27, 2010, Released January 29, 2010. Electronically at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-10-208A1.pdf. Hereinafter, the “*Order*.” See also [75 FR 17874-17878](http://www.fcc.gov), April 8, 2010.

3. In these comments, I urge the Commission and Media Bureau to deny the instant request. The record does not support the request, since the *Order* on which it is predicated suffers significant failings. The *Order* was based on an erroneous presumption of an important and material question of fact (manifest technical error), was based in large part on repetitious filings of knowingly false statements, was adopted absent proper process under the Administrative Procedure Act, resulting in additional error, was adopted in clear contravention of the Commission’s rules, and is not yet administratively final. Any one of these reasons would be sufficient to deny the instant request. Together, they demonstrate a compelling case against it.

4. To the extent that the Commission has time and resources to devote to advancing IBOC digital broadcast radio, such effort would be best spent establishing the complete technical standard for this service. The need for a technical standard was often noted in the early stages of this proceeding, and culminated in a “Comments Sought” Public Notice issued 6 ½ years ago.⁴ In the intervening 6 ½ years, the comments received on this Public Notice have received no consideration in any of several actions taken with respect to this broadcast service, including the *Order*. In charting a path forward from here, I urge the Commission to renew a commitment to establishing a complete and open standard for the IBOC digital broadcasting service, and to avoid a seriatim and piecemeal consideration of the elements in such a standard. Rather than focusing on individual elements, such as digital sideband power, the Commission should seek to finalize the standard as a whole. The Commission should not give special priority to a single facet of a complete standard, such as digital sideband power, rather than equal consideration to them all.

⁴ 20 FCC Rcd 10712, [DA 05–1661](#), Comments Sought on National Radio Systems Committee’s “In-Band/On-Channel Digital Radio Broadcasting Standard NRSC-5,” MM Docket No. 99-325, June 16, 2005; electronically at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-05-1661A1.pdf.

II. THE REQUEST LACKS FOUNDATION, AND SHOULD BE DENIED, BECAUSE THE ELEVATED SIDEBAND POWER ORDER ITSELF WAS BASED ON SIGNIFICANT ERROR

A. The *Order* was Based on Manifest Technical Error

5. The *Order* was predicated on a mistaken belief that IBOC digital sidebands, even those as powerful as –10 dBc, comply with the Commission’s FM emissions mask as given in [§ 73.317](#) of the Commission’s rules.⁵ This premise is manifestly untrue. In relevant part, [§ 73.317](#) requires that, “Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive must be attenuated at least 25 dB below the level of the unmodulated carrier.”⁶ IBOC digital sidebands are removed from the carrier by 129 kHz to 198 kHz, which falls within the range specified by this rule.⁷ However, the 2002 standard for digital power was –20 dBc, which is 5 dBc greater than that allowed by [§ 73.317](#). The *Order* allowed powers as great as –10 dBc, which is 15 dBc greater than that allowed by [§ 73.317](#). “15 dBc greater” means 31.6 times the allowed power.

6. [§ 73.317](#) is relevant because this rule creates a rebuttable presumption that transmissions that fall within its specified limits, the so-called “emissions mask,” will not create harmful interference.⁸ However, since digital sidebands exceed the threshold of –25 dBc—that is, exceed the emission mask—they are not entitled to any such presumption. The question of

⁵ *Order* at 4

⁶ 47 C.F.R. § 73.317(b). In the nomenclature used in the instant proceeding, “below the level of the unmodulated carrier” is signified by a minus sign in front of the value and a letter “c” after “dB.” That is, the specification in this rule is “–25 dBc.”

⁷ See Doc. No. SY_IDD_1011s rev. G, HD Radio™ Air Interface Design Description - Layer 1 FM, iBiquity Digital Corporation, August 23, 2011, at Table 5-1; electronically at <http://www.nrscstandards.org/download.asp?file=NRSC-5-C.asp>. This specification refers to “Hybrid” operating mode. In “Extended Hybrid” operating modes, the sidebands may occupy spectrum from 102 kHz to 198 kHz removed from the carrier.

⁸ The rule also requires that, notwithstanding the specified emission limits, “should harmful interference to other authorized stations occur, the licensee shall correct the problem promptly or cease operation.”

whether or not they create harmful interference must be determined through testing and analysis. Such testing was done, and as discussed in Subsection II.C *infra*, it concluded that any sideband powers greater than –20 dBc (symmetric) create harmful interference within the Commission’s frequency allocation scheme based on a D/U ratio of 6 dB. When considering asymmetric sidebands, the equivalent conclusion would be that either sideband in excess of –23 dBc would create the same degree of harmful interference. (Division by 2 and subtraction of 3 dBc are equivalent.)

7. The instant request to have asymmetric sideband power in excess of –20 dBc should be denied for the same reasons that symmetric sideband power in excess of –20 dBc should be denied: these power levels exceed the Commission’s FM emissions mask as given in [§ 73.317](#) of the Commission’s rules and they create harmful interference to the incumbent FM broadcast service. Further, as explained in detail in my *Application for Review*, allowing broadcast powers in excess of –20 dBc (or –23 dBc per sideband) constitutes allocation of new spectrum.⁹ A finding here that this spectrum should be used for digital broadcasting, as opposed to analog broadcasting for new entrants or unlicensed use, would be a fundamental policy decision that is reserved to the full Commission under [§ 0.283\(c\)](#) of the Commission’s rules. Furthermore, under standing Commission’s policy, digital broadcasting, “must minimize interference to analog AM and FM stations during that period when digital and analog service operate concurrently.”¹⁰

⁹ *Application for Review* at 8–11, and 21–23

¹⁰ 15 FCC Rcd 1722–1749, Notice of Proposed Rule Making in the Matter of *Digital Audio Broadcasting Systems And Their Impact On the Terrestrial Radio Broadcast Service*, MM Docket No. 99–325 (FCC 99–327), Nov. 1, 1999, at 18; electronically at http://transition.fcc.gov/ftp/Bureaus/Mass_Media/Databases/documents_collection/99-327.pdf.

B. The *Order* is Colored by Repeated, Knowingly False Statements

8. The error documented in the preceding section did not happen spontaneously. The groundwork was laid by a series of knowingly false statements made by proponents of the *Order*. As explained in detail in my *Application for Review*,¹¹ the crux of the deception was to take the emission limit specification in [§ 73.317](#), –25 dBc, and to claim that it applied separately to many subdivisions within the range of frequencies removed from the carrier by between 120 kHz and 240 kHz. More specifically, they claimed that “–25 dBc” applied on a “per kHz” basis. Since there are 240 slices of spectrum 1 kHz wide within this range (taking into account the spectrum both above and below the carrier), the proponents created an illusion that [§ 73.317](#) permits up to 240 times the emissions than it actually does.^{12–13}

9. To state the true facts clearly, –20 dBc, –14 dBc, and –10 dBc are all levels of digital power transmission that are greater than –25 dBc, the relevant emission permitted by the Commission’s FM emissions mask (in [§ 73.317](#)), by 5 dBc, 11 dBc, and 15 dBc, respectively. IBOC divides radiated power between two spectral peaks, one each in the upper and lower first-adjacent channels. In the symmetric case, the power is divided evenly, creating distinguishable emissions each having individual powers of –23 dBc, –17 dBc, and –13 dBc, respectively. These distinguishable emissions also individually exceed the –25 dBc standard, by 2 dBc, 8 dBc, and 12 dBc, respectively. Under consideration now are asymmetric cases where the powers in the two spectral peaks would differ, but would nonetheless each be between –17 dBc and –13 dBc.

¹¹ *Application for Review* at 14–18

¹² For reference, 240 times –25 dBc is –1.2 dBc. This would mean that the regulation allows up to 76% of the carrier power in the two adjacent channels, an assertion that is patently false.

¹³ For completeness, I should note that § A.3.1 in Appendix B of the *First Report and Order*, http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-02-286A2.pdf, wrongly describes [§ 73.317](#) as having units of measurement of dBc/kHz (rather than dBc). Because this document is outdated and incorrect in many respects, its continued reference by [§ 73.404\(a\)](#) of the Commission’s rules can lead to confusion and regulatory uncertainty. See IV, *infra*.

All of these would exceed the FM emissions mask, by 8 dBc to 12 dBc. However, this is not what the record shows.

10. In their original petition, the Joint Parties wrote, “digital signals at the -10 dB power level continue to comply with the Commission's analog FM emissions mask.”¹⁴ This statement is false. Later in the proceeding, the Joint Parties commented, “The Power Increase Request was carefully structured to insure that under the Commission’s existing standards and rules, HD Radio stations, even when operating at the increased digital power level of -10 dBc, will not create harmful interference to first adjacent analog operations. In particular, the requested HD Radio digital power increase fits within the existing FCC FM mask.”¹⁵ This statement is also false. A digital power level of –10 dBc exceeds the standard of –25 dBc by 15 dBc. That is, this power level is more than 30 times greater than that allowed by [§ 73.317](#). The Joint Parties include four prominent transmitter manufacturers and broadcast licensees with among the best engineering departments in the Nation. Through their training and experience they should be expected to know the difference between power (measured in dBc) and power spectral density (measured in dBc/kHz), and that these statements were not true.

11. For its part, iBiquity produced illustrations to drive home the same point. The figure below was put on the docket twice.^{16–17}

¹⁴ Letter from Steven A. Lerman and John W. Bagwell, on behalf of the Joint Parties (American Public Media Group, et al.), June 10, 2008, MM Docket No. 99–325, at p. 4; electronically at <http://fjallfoss.fcc.gov/ecfs/document/view?id=6520027716>.

¹⁵ Comments of Backyard Broadcasting, LLC, et al., July 6, 2009, MM Docket No. 99–325, at p. 14; electronically at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7019808316>.

¹⁶ “FM HD Radio™ System Performance At Elevated Carrier Levels,” December 2007, iBiquity Digital Corp., filing of June 10, 2008, at p. 2; electronically at <http://fjallfoss.fcc.gov/ecfs/document/view?id=6520014138>.

¹⁷ “FM HD Radio™ System Performance At Elevated Carrier Levels,” June 30, 2009, Charles River Broadcasting Co. and iBiquity Digital Corp., filing of WKLB-FM, MM Docket No. 99–325, July 6, 2009, at p. 5; at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7019808319>.

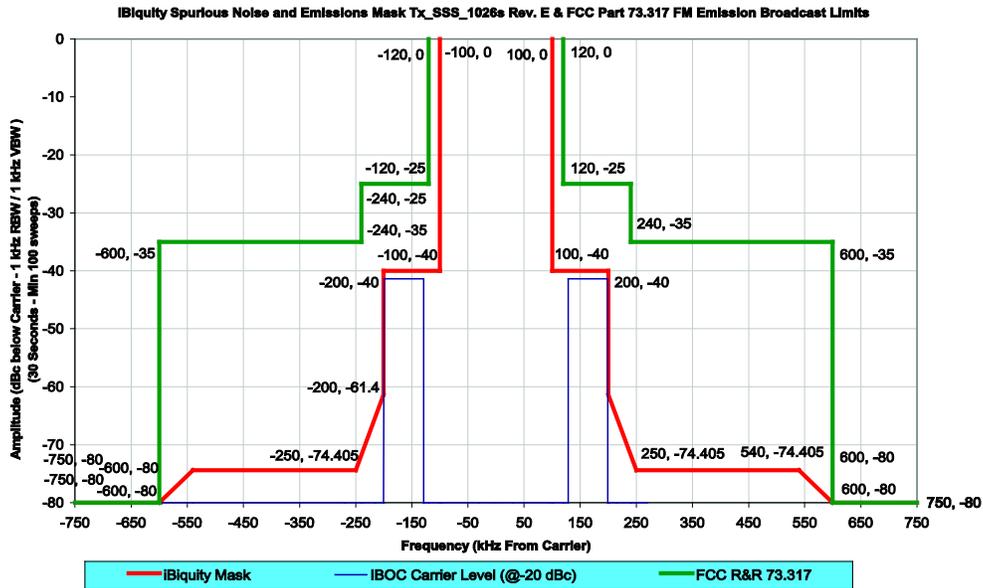


Figure 1 - FM Hybrid IBOC Spectral Test Mask @ -20 dBc

This figure is false. It purports to show, on a single graph and with a single y-axis scale, the “amplitude” of separate engineering quantities that have different dimensionality and different units of measurement. The blue and red curves¹⁸ are power spectral densities, measured in dBc/kHz (dBc per kilohertz). The green curve, which purports to be “FCC R&R 73.317,” is a false representation of that rule. [§ 73.317](#) is a specification of attenuated power, measured in dBc, and contains no specifications for power spectral density. It is not possible to compare the green curve ([§ 73.317](#)) and the red curve directly in this manner, as they are dimensionally different. (This is popularly known as “comparing apples and oranges.”) This illustration miscasts the green curve as a power spectral density and in context states graphically that [§ 73.317\(b\)](#) allows off-carrier power of -25 dBc per kilohertz—that is, in each kilohertz interval in the range -240 kHz to -120 kHz and 120 kHz to 240 kHz. This is not what the rule permits. Since there are 240 kilohertz intervals total in this range, the illustration purports that [§ 73.317\(b\)](#) allows not -25 dBc, but rather up to 240 times that amount, or -1.2 dBc. This is a nonsensical

¹⁸ Color may be seen in the original PDF documents at the links cited, and in the PDF of this document as filed on the ECFS.

interpretation of [§ 73.317\(b\)](#), as it would mean that 76% of the carrier power is allowed in the two adjacent channels.

12. The illustration below shows the true relationship between [§ 73.317](#) and the IBOC hybrid digital emissions at the traditional level of -20 dBc. It is meant to convey the following points. The IBOC digital emissions occur in two spectral peaks, one centered at 163.9 kHz below the carrier and one centered at 163.9 kHz above the the carrier. Both have rectangular profiles and bandwidths of 69 kHz. Each exceeds the power specification in [§ 73.317\(b\)](#) by 2 dBc, and since there are two of them, the specification in [§ 73.317\(b\)](#) is exceeded in total by 5 dBc.¹⁹

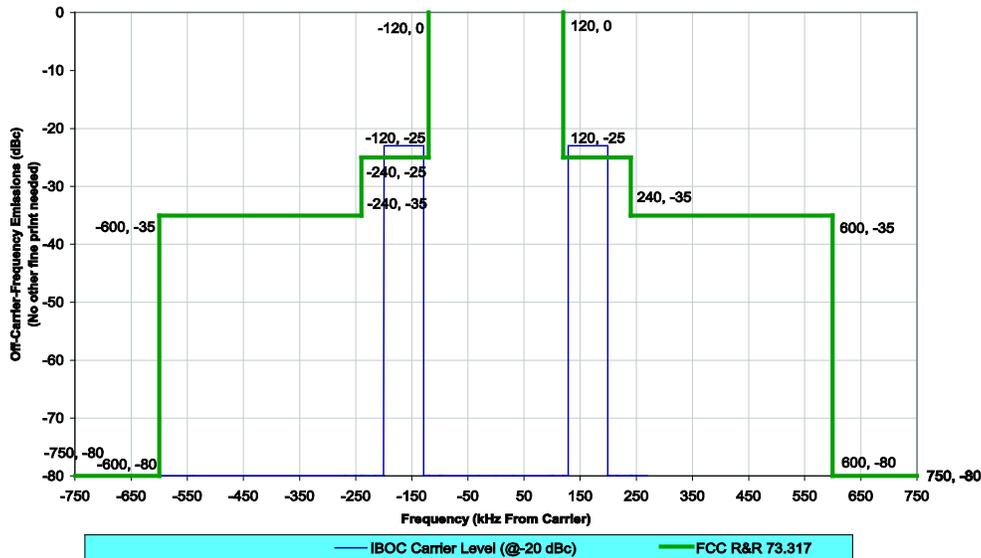


Figure 1 - FM Hybrid IBOC Spectral Occupancy @ -20 dBc

¹⁹ In the extended hybrid modes, the locations and widths of the spectral peaks differ, and the total power differs too. In the widest of the extended hybrid modes, the emissions are centered at 150.1 kHz above and below the carrier, have bandwidths of 96.7 kHz (that is, occupying spectrum 101.7 kHz to 198.4 kHz away from the carrier), and each have power levels of -21.5 dBc, 40% greater than -23 dBc (total power in both peaks being -18.5 dBc rather than -20 dBc).

13. The figure below was also put on the docket twice, in the same sources.

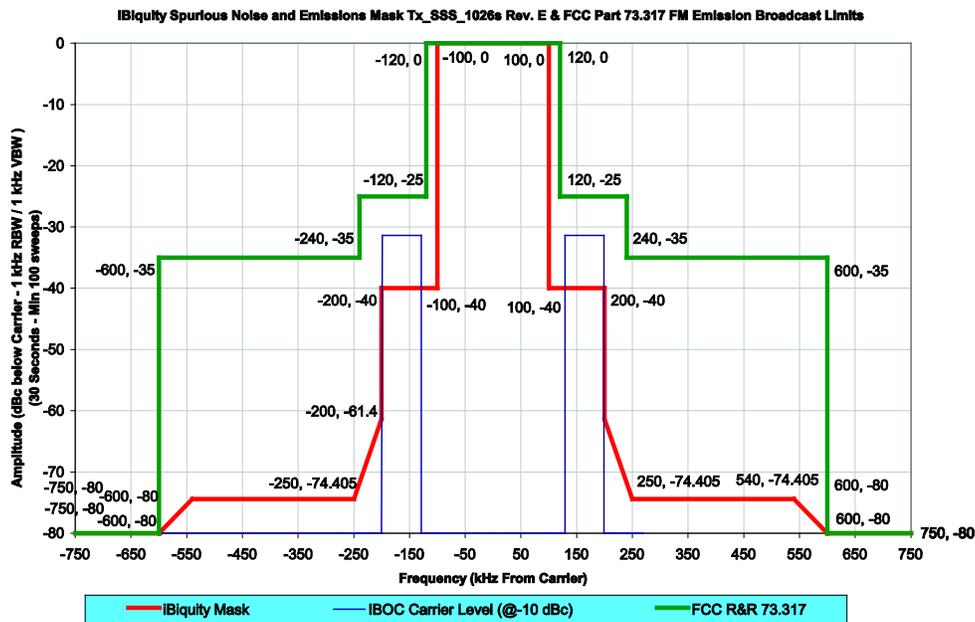


Figure 3 - FM Hybrid IBOC Spectral Test mask @ -10 dBc

This figure is also false, for the same reasons as the previous one. iBiquity says in reference to this figure, “The digital sidebands comply with the FCC mask.” This statement is false; the digital sidebands each exceed the FCC mask by 12 dBc, 15 dBc in total. In comment, iBiquity elaborates.²⁰ “Today, the existing interference protection standard is the FM frequency mask. [See 47 CFR § 73.317 (2009).] Over the years this has been an effective standard to insure that broadcasters do not receive harmful interference. Even if the Commission were to approve the entire power increase as proposed by the Joint Parties, the digital HD Radio signal would still be within the existing FM frequency mask.” This statement is false; at -10 dBc, the digital IBOC signal exceeds the specification in § 73.317 (-25 dBc) by 15 dBc. Furthermore, because the specification in § 73.317 is substantially exceeded, it indicates that interference protection is likely not provided.

²⁰ Comments of iBiquity Digital Corporation, July 6, 2009, MM Docket No. 99-325, at p. 8; electronically at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7019808294>.

14. The illustration below shows the true relationship between [§ 73.317](#) and the IBOC hybrid digital emissions at the elevated level of -10 dBc. It is meant to convey the following points. The IBOC digital emissions occur in two spectral peaks, one centered at 163.9 kHz below the carrier and one centered at 163.9 kHz above the carrier. Both have rectangular profiles and bandwidths of 69 kHz. Each exceeds the power specification in [§ 73.317\(b\)](#) by 12 dBc, and since there are two of them, the specification in [§ 73.317\(b\)](#) is exceeded in total by 15 dBc.²¹

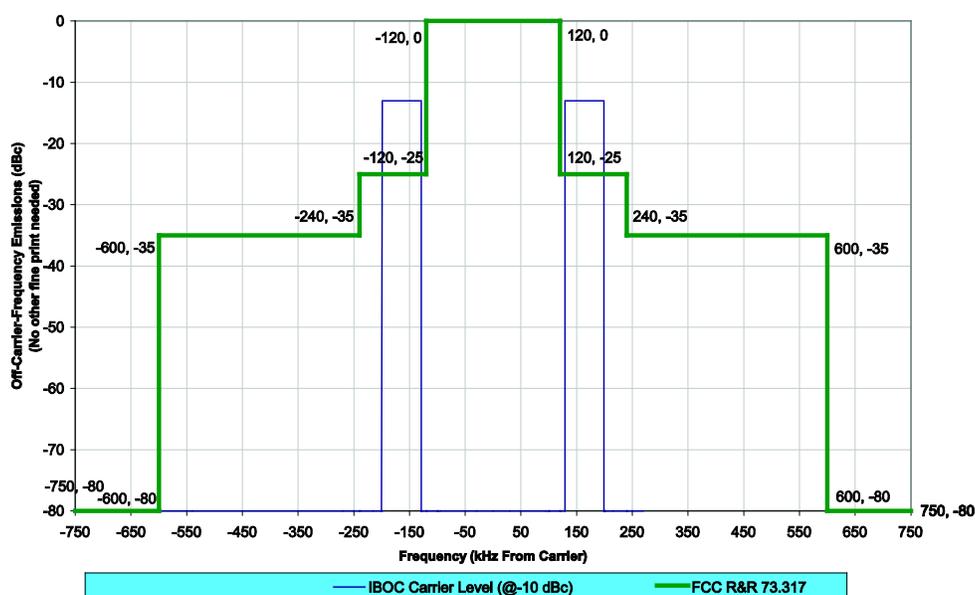


Figure 3 - FM Hybrid IBOC Spectral Occupancy @ -10 dBc

15. I expect that objections will be raised that I could have pointed out these false statements in comments earlier. However, it was not until early 2010 that I gave concerted thought as to how spectrum analyzers are applied to the measurement of IBOC subcarriers, and worked the numbers. Even so, during public comment citizens need not correct wrongful statements of an agency's rules that might appear, as agencies are presumed to be already

²¹ In the extended hybrid modes, the locations and widths of the spectral peaks differ, and the total power differs too. In the widest of the extended hybrid modes, the emissions are centered at 150.1 kHz above and below the carrier, have bandwidths of 96.7 kHz (that is, occupying spectrum 101.7 kHz to 198.4 kHz away from the carrier). According to one interpretation, explained in III, *infra*, each emission has a power level of -11.5 dBc, 40% greater than -13 dBc (total power in both peaks being -8.5 dBc rather than -10 dBc).

authoritative in the meaning of their own rules. Furthermore, even though I did not raise an objection in earlier comments, others did,²² and none of this affects the continuing obligation of applicants to ensure that the record is accurate on facts of decisional significance.²³ During the prosecution of my *Application for Review*, a pleading was served on all relevant parties that made clear that I wished to give iBiquity an opportunity to gracefully “justify or retract” their statements.²⁴ To date, in 20 months, they have declined to do either.

16. In my *Application for Review*, and here, I assert that these statements are not only false, they are knowingly false.²⁵ iBiquity’s patents on the IBOC system (including [U.S. Patent No. 5,465,396](#), *In-band on-channel digital broadcasting*, [U.S. Patent No. 5,757,854](#), *In-band on-channel digital broadcasting*, and [U.S. Patent No. 6,510,175](#), *In-band on-channel digital broadcasting*) say, “FCC 73.317 defines the spectral allocation for commercial FM in the United States over a 1.2 MHz bandwidth. Compliance with FCC 73.317 allows the power within 480 kHz of this bandwidth to reach 25 dBc.” [*sic*, –25 dBc meant] “The following broadcast parameters have been chosen for IBOC-DAB: ... MODULATION SPECTRUM: Complies with FCC 73.317. ... FCC 73.317 requires that transmitted power between ±120 and ±240 kHz be below –25 dBc. The scheme described transmits DAB power at –28 dBc, leaving a 50% margin.” This is explicit recognition that [§ 73.317](#) requires *total* power between 120 kHz and

²² See Comments of Mark D. Humphrey, CPBE, December 4, 2008, MM Docket No. 99–325, at p. 2 (<http://fjallfoss.fcc.gov/ecfs/document/view?id=6520190203>), Reply Comments of Prometheus Radio Project, et al., January 12, 2009, MM Docket No. 99–325, at p. 3 (citing Humphrey) (<http://fjallfoss.fcc.gov/ecfs/document/view?id=6520193388>), Comments of Deborah S. Proctor, BSEE, CPBE (WCPE FM), December 3, 2008, MM Docket No. 99–325 (<http://fjallfoss.fcc.gov/ecfs/document/view?id=6520189682>), and Comments of Nevada City Community Broadcast Group, Inc., December 5, 2008, MM Docket No. 99–325, at p. 4, (<http://fjallfoss.fcc.gov/ecfs/document/view?id=6520193407>), including attached Complaint (<http://fjallfoss.fcc.gov/ecfs/document/view?id=6520193408>) at pp. 4–6.

²³ See [47 C.F.R. § 1.65](#)

²⁴ Opposition to Motion for Extension of Time, April 25, 2010, MM Docket No. 99–325; electronically at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020417607>.

²⁵ *Application for Review* at 10–21

240 kHz off carrier to be below –25 dBc. And for the avoidance of doubt, they did not achieve the intended target of digital sideband power being –28 dBc—if they did, we would not be having this comment period now. Indeed, by the time iBiquity filed their Petition for Rule-making,²⁶ they had come to realize that digital transmission within the [§ 73.317](#) spectral mask could not be achieved. Therefore, they petitioned the Commission for a more lenient mask that would apply to digital broadcasting. “In order to ensure compatibility in an IBOC DAB world, several emission masks will be necessary. First, the current analog emissions mask as defined in Sections 73.317 and 73.44 of the Commission’s rules for FM and AM, respectively, would continue to apply to all stations as long as they transmit in an analog-only mode. Second, any FM station that simultaneously transmits analog and digital signals in the hybrid mode will be required to meet a new FM hybrid mask for the combined analog and digital transmissions.”²⁷ The proposed new hybrid-mode emission mask had proper units of measurement for broadband digital transmission (dBc/kHz) and allowed higher total power. The proposed rule, hypothetically numbered § 73.325(b)(i), said in part, “The measured power spectral density of the analog and digital signals at frequencies removed from the center of the channel between 100 kHz and 200 kHz must not exceed –40 dBc/kHz.”²⁸ As previously explained in my *Application for Review*, this corresponds to –20 dBc, with slight margin for engineering tolerance. iBiquity most assuredly knew that their more recent statements justifying an increase in digital power were not true.

17. The *Order* raises the philosophical question of whether harmful interference exists absent six citizens that are motivated to complain (rather than change stations or turn off

²⁶ USA Digital Radio, *Petition for Rulemaking*, October 7, 1998 (RM-9395); available electronically at <http://fjallfoss.fcc.gov/ecfs/comment/view?id=217027>.

²⁷ *Id.*, at p. 86 electronically at <http://fjallfoss.fcc.gov/ecfs/document/view?id=2170270004>.

²⁸ *Id.*, at Appendix A, p. 3; <http://fjallfoss.fcc.gov/ecfs/document/view?id=2170270005>.

the radio).²⁹ In that spirit, one might ask whether making false statements to Government officials is a problem if no one complains. The answer is ‘yes’³⁰—and for definitiveness, I am complaining. Virtually all FCC forms admonish the signer that violation of [18 U.S.C. 1001](#) can lead to severe penalties. In rulemaking, the Commission should be no less demanding. Here, the requesters are seeking exclusive use of new, valuable spectrum in the face of others who want use of the spectrum for other purposes.³¹ Their repeated making of false statements, and leaving them uncorrected after the situation was called to their attention, should—at a minimum—be an immediate and absolute bar to their request.

C. The *Order* was Adopted Absent Proper Process under the Administrative Procedure Act, Resulting in Additional Error

18. In § 6 *supra*, I point out that the digital sidebands at issue all exceed the spectral mask defined by [§ 73.317](#), and therefore the requestors are not entitled to a presumption that they would not create harmful interference. This is a determination that must be made through testing and analysis. Such testing was done. NPR applied for, and received, a \$350,000 grant from the Corporation for Public Broadcasting to conduct an Advanced IBOC Coverage and Compatibility Study (AICCS). This study was designed to make systematic measurements to determine what level of digital power might cause harmful interference. On November 4, 2009, NPR added an AICCS report to the public record.³² The next day, NPR and iBiquity put forward a joint proposal on the power-increase matter.³³ By implication, this joint proposal formed the basis of

²⁹ *Order* at 28

³⁰ See [§ 1.17](#) of the Commission’s rules. See also [18 U.S.C. 1001](#).

³¹ *Application for Review* at 9

³² See NPR *ex parte*, Nov. 4, 2009, <http://fjallfoss.fcc.gov/ecfs/comment/view?id=6015395377>. An expanded version (dated November 24, 2009) containing two additional chapters was later posted on-line at <http://www.nprlabs.org/media/publications/20091218AICCSreport.pdf>.

³³ See iBiquity/NPR *ex parte*, Nov. 5, 2009, <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020245744>

the *Order*.³⁴ Nonetheless, the *Order* declares the question on “completion and comment on the further NPR studies” as being “moot” because “NPR recently submitted its further test results.”³⁵

19. There are three problems here. One is the Commission’s misunderstanding of what the AICCS report actually said. Another is the role of NPR in overriding its own report and drafting rules that favored their clients over the public. But the first problem, which spawned the other two, is that the Commission has never put the AICCS report up for public comment. It is in the crucible of the public comment phase that data are tested and salient details are revealed.

1. Public Comment on the Advanced IBOC Coverage and Compatibility Study (AICCS) is Required

20. It is well established that technical studies and data must be made available for public comment prior to adoption of rules based on them.

“Construing section 553 of the APA, the court explained long ago that ‘[i]n order to allow for useful criticism, it is especially important for the agency to identify and make available *technical studies and data* that it has employed in reaching the decisions to propose particular rules.’ *Conn. Light & Power Co. v. Nuclear Regulatory Comm’n*, 673 F.2d 525, 530 (D.C. Cir. 1982) (emphasis added).”³⁶

“By requiring the ‘most critical factual material’ used by the agency be subjected to informed comment, the APA provides a procedural device to ensure that agency regulations are tested through exposure to public comment, to afford affected parties an opportunity to present comment and evidence to support their positions, and thereby to enhance the quality of judicial review.”³⁷

³⁴ See, e.g., *Order* at 17–19.

³⁵ *Order, Id.*, at Fn. 25.

³⁶ *American Radio Relay League, Inc. v. FCC*, 524 F.3d 227 (D.C. Cir. 2008) at p. 12; electronically at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-281787A1.pdf.

³⁷ *Chamber of Commerce of the United States v. Securities and Exchange Commission* (“*Chamber II*”), 443 F.3d 890, 900 (D.C. Cir. 2006); electronically at <http://pacer.cadc.uscourts.gov/docs/common/opinions/200604/05-1240a.pdf>

21. *Portland Cement*³⁸ is the leading case on this subject. In *Portland Cement*, the EPA navigated a tight schedule imposed by Congress in the Clean Air Act to issue regulations reducing the emission of air pollution (particulate matter—dust) from cement manufacturing plants. A regulation was proposed in August 1971 and adopted in December 1971 after more than 200 parties had submitted comments. The regulation was influenced by technical studies and data that were not publicly described in detail until April 1972. Indeed, one of the principal studies was begun during the pendency of the proposed regulation, and by implication its results could not have been made available in time for public comment. However, when the details became known, credible challenges arose as to the procedures used and the conclusions drawn. The court found,

“a critical defect in the decision-making process in arriving at the standard under review in the initial inability of petitioners to obtain—in timely fashion—the test results and procedures used on existing plants which formed a partial basis for the emission control level adopted, and in the subsequent seeming refusal of the agency to respond to what seem to be legitimate problems with the methodology of these tests.”³⁹

“In order that rule-making proceedings to determine standards be conducted in orderly fashion, information should generally be disclosed as to the basis of a proposed rule at the time of issuance. If this is not feasible, as in case of statutory time constraints, information that is material to the subject at hand should be disclosed as it becomes available, **and comments received**, even though subsequent to issuance of the rule—with court authorization, where necessary.”⁴⁰

That is, the court declared the need for comments so important, it was offering to intervene to allow them, even in the face of a legislated deadline.

³⁸ *Portland Cement Assn. v. Ruckelshaus*, 486 F.2d 375–402 (D.C. Cir. 1973); electronically at <http://ftp.resource.org/courts.gov/c/F2/486/486.F2d.375.72-1073.html>.

³⁹ *Portland Cement Assn. v. Ruckelshaus*, Id. at 392

⁴⁰ *Portland Cement Assn. v. Ruckelshaus*, Id. at 394. Emphasis added.

“This record reveals a lack of an adequate opportunity of the manufacturers to comment on the proposed standards, due to the absence of disclosure of the detailed findings and procedures of the tests. . . . While we remain diffident in approaching problems of this technical complexity, see *International Harvester*, supra, at 443 of 155 U.S. App. D.C., at 647 of 478 F.2d the necessity to review agency decisions, if it is to be more than a meaningless exercise, requires enough steeping in technical matters to determine whether the agency ‘has exercised a reasoned discretion’. *Greater Boston TV v. FCC (I)*, 143 U.S. App. D.C. 383, 392, 444 F.2d 841, 850, cert. denied, 403 U.S. 923, 91 S.Ct. 2229, 29 L.Ed.2d 701 (1971). We cannot substitute our judgment for that of the agency, but it is our duty to consider whether ‘the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.’ *Citizens To Preserve Overton Park v. Volpe*, 401 U.S. 402, 416, 91 S.Ct. 814, 824, 28 L.Ed.2d 136 (1971). Ultimately, we believe, that the cause of a clean environment is best served by reasoned decision-making. The record is remanded for further proceedings not inconsistent with this opinion.”⁴¹

22. In the 28 years since *Portland Cement*, this principle has become ingrained in rulemaking—with one notable exception that proves the rule. In *Community Nutrition Institute v. Block*,⁴² the court rejected a challenge to a regulation that was informed by scientific studies completed after the comment period.

“The studies here in question, unlike the study in *Portland Cement*, did not provide entirely new information ‘critical’ to the Secretary’s determination. To the extent that they supported the challenged labeling change, they expanded on and confirmed information . . . which the Secretary had summarized in his notice of proposed rulemaking.”⁴³

“...consistent with the APA, an agency may use ‘supplementary’ data, unavailable during the notice and comment period, that ‘expand[s] on and confirm[s]’ information contained

⁴¹ *Portland Cement Assn. v. Ruckelshaus*, Id. at 402

⁴² *Community Nutrition Institute, et al. v. John R. Block*, 749 F.2d 50 (D.C. Cir. 1984); electronically at <http://openjurist.org/749/f2d/50/community-nutrition-institute-v-r-block>.

⁴³ *Community Nutrition Institute, et al. v. John R. Block*, Id. at 58

in the proposed rulemaking and addresses ‘alleged deficiencies’ in the pre-existing data, so long as no prejudice is shown.”⁴⁴

23. The key element of tension, therefore, is whether a late technical study (or any additional reference not identified prior to the comment period) provides critical, new information, or whether its information is merely confirmatory or supplementary to prior studies (or any previously identified references). This tension is explored in depth, e.g., in *Chamber II*.³⁷

24. Here, there is no doubt but that the Advanced IBOC Coverage and Compatibility Study provided new, not merely confirmatory information. No such prior study had been done, which is why NPR advocated it and the Corporation for Public Broadcasting spent \$350,000 to fund it. Prior to the AICCS Report, the Commission had anecdotal information about what had *not* happened during testing of elevated sideband power—spontaneous complaints. The strength of the AICCS was that it was the first study of what actually *did* happen under various controlled and well-measured conditions of potential digital interference into analog. Its major contribution was that, for the first time, there was quantified, experimental data on the impact of higher digital powers. Rather than relying on spontaneous complaints, it assembled a panel of listeners—ordinary citizens with no axes to grind—and took into account all of their observations.

25. I previously raised this issue in my *Application for Review*, and the thrust of the opposition was that I, personally, knew of the AICCS report and had the opportunity to file comments (which would have been *ex parte* at the time). As the expression goes, this is not about me. I am not a named person in this rulemaking action⁴⁵—indeed, it is a rule of general applicability, without specific parties. As the Court made clear in *Utility Solid Waste Activities*

⁴⁴ *Solite Corporation v. U.S. EPA*, 952 F.2d 473, 484 (D.C. Cir. 1991); electronically at <http://openjurist.org/952/f2d/473>.

⁴⁵ See, e.g., Administrative Procedure Act (“APA”) [5 U.S.C. 553\(b\)](#)

Group, et al. v. EPA,⁴⁶ there is no substitute for proper publication of notice in the *Federal Register*. The same is true here. It is the public that is owed proper notice, and they have yet to receive it.

26. The conclusion here is straightforward: the *Order* on which the instant request is predicated should be withdrawn until the AICCS report is tested in public comment.

Additionally, the absence of informed comments about the AICCS report colors the instant request as well. The same issue of digital interference into analog at elevated sideband powers (greater than –20 dBc, that is, greater than –23 dBc each) is present. For independent but similar reasons, the instant request should not be granted unless and until the Advanced IBOC Coverage and Compatibility Study report is properly noticed as a basis for the Commission’s decision, and put up for public comment.

2. The AICCS Proves that Elevated Digital Powers Create Harmful Interference

27. On the subject of adjacent channel interference, the principal technical finding of the AICCS report is that it requires a D/U ratio of 6 dB to avoid harmful interference of digital into analog with –20 dBc digital power, a D/U ratio of 8.9 dB to avoid harmful interference with –14 dBc digital power, and a D/U ratio of 10 dB to avoid harmful interference with –10 dBc digital power.⁴⁷ A D/U ratio of 6 dB is the regulatory standard for interference protection between first-adjacent stations.⁴⁸ In other words, the principal finding of the research study was that digital powers greater than –20 dBc created harmful interference *within* the protected

⁴⁶ *Utility Solid Waste Activities Group, et al. v. Environmental Protection Agency*, 236 F.3d 749, 754 (D.C. Cir. 2001); electronically at [http://www.cadc.uscourts.gov/internet/opinions.nsf/05601975C267424C85256F7A0063D685/\\$file/99-1372a.txt](http://www.cadc.uscourts.gov/internet/opinions.nsf/05601975C267424C85256F7A0063D685/$file/99-1372a.txt).

⁴⁷ Report to the CPB and FCC on the Advanced IBOC Coverage and Compatibility Study, November 3, 2009, p. 30; <http://fjallfoss.fcc.gov/ecfs/comment/view?id=6015395377>.

⁴⁸ See [47 C.F.R. 73.215](#). See also [47 C.F.R. 73.509](#) and Section 2.1, pp. 3–4, in the AICCS Report, *Id.*

contours of first-adjacent analog stations under the Commission’s frequency allocation scheme. Arguably the study chose methods of data interpretation that allowed a D/U ratio of 6 dB to be sufficient for –20 dBc sidebands when it might not otherwise have been, but on its face this is what the report concluded.⁴⁹ Nonetheless, the report’s conclusions are in sharp contrast to the *Order*, which found, “that the record establishes that the digital power limits set forth in this order will provide the necessary protection to analog FM stations.”⁵⁰

28. Early in his administration, President Obama spoke to the point that agencies were to ensure, “the highest level of [scientific] integrity in all aspects of the executive branch’s involvement with scientific and technological processes.”⁵¹ In prepared remarks, the President amplified on what this Memorandum was intended to achieve. “It is about letting scientists like those here today do their jobs, free from manipulation or coercion, and listening to what they tell us, even when it’s inconvenient—especially when it’s inconvenient. It is about ensuring that scientific data is never distorted or concealed to serve a political agenda—and that we make

⁴⁹ See *Application for Review* at 34. See also, Barry McLarnon, “Oh Well, on With the Experiment ...,” April, 26, 2010, Radio World Online, electronically at <http://www.rwonline.com/article/oh-well-on-with-the-experiment-.../3126>. According to McLarnon, “The report says that a correction factor of 8 dB is ‘appropriate’ for separations up to 68 miles, but the accompanying graphs (Fig. 27) show that is clearly not true—the correction factor should decrease monotonically towards zero as the spacing is reduced. This is not a ‘one size fits all’ situation. The larger issue is: Why make this correction at all? The 10 percent field strength value is the time-honored standard for ensuring that the regulatory D/U limits (6 dB for first adjacencies) are rarely exceeded, so why would it not also apply to digital interference? I’ve thought about it long and hard, and I simply can’t see the rationale for making this correction—except, of course, that it supplies 8 dB of headroom for a power increase. Without it, the power increase idea simply won’t fly.”

⁵⁰ *Order* at 23. The “record” being referenced also includes the false statements described in §§ 8–16, the non-existence of unlikely spontaneous complaints, and, “five years of interference-free FM hybrid digital operations by approximately 1500 stations.” (*Order* at 15.) This is akin to the Food and Drug Administration concluding that since a drug at a particular dosage is safe, it necessarily follows that the drug at 4 to 10 times that dosage would also be safe.

⁵¹ Presidential Memorandum of March 9, 2009, for the Heads of Executive Departments and Agencies, *Scientific Integrity*, [74 FR 10671–10672](https://www.federalregister.gov/documents/2009/03/09/74-FR-10671-10672).

scientific decisions based on facts, not ideology.”⁵² The President’s stated goal is to base public policies, “on the soundest science.”⁵³

29. Here, we have at hand a definitive technical study on the effect of elevated sideband powers, and the results are “inconvenient” to say the least. The AICCS report demonstrates that elevated digital sideband powers, of the levels contemplated in the instant request, do create harmful interference to adjacent channel stations at spacings commensurate with the Commission’s frequency allocation scheme. The Commission should listen to the soundest available engineering data on the subject and deny the instant request.

3. NPR Put Their Private Interest Before the Public Interest

30. What, then, is one to make of the disconnect between the technical result of the AICCS report and the fact that its sponsor, NPR, supports higher digital powers? Why did NPR bury their principle technical result on page 30 of their report, and then put forward a proposal that bore no logical nexus to it? Well, NPR has conflicted interests in this matter.

31. NPR is fond of introducing itself in its filings on this docket as the producer and distributor of fine programming such as *All Things Considered*. However, their filings here are not in made in their capacity as a producer and distributor of fine programming. NPR files on this docket in their capacity as the Washington lobbyist for certain noncommercial stations.⁵⁴ Their contemporaneous disclosure reports confirm the obvious, that they were lobbying the FCC for the IBOC power increase while simultaneously lobbying for the Corporation for Public

⁵² The White House, Office of the Press Secretary, March 9, 2009, Remarks of President Barack Obama – As Prepared for Delivery Signing of Stem Cell Executive Order and Scientific Integrity Presidential Memorandum; electronically at <http://www.whitehouse.gov/the-press-office/remarks-president-prepared-delivery-signing-stem-cell-executive-order-and-scientifi>.

⁵³ *Id.*

⁵⁴ National Public Radio is registered as a lobbying organization with Senate ID# 28413–12 and House ID# 310730000. Their lobbying disclosure reports may be found at <http://disclosures.house.gov/ld/ldsearch.aspx> by using the House ID as the search field.

Broadcasting (CPB) and the Public Telecommunications Facilities Program (PTFP) within NTIA.⁵⁵ And they should be proud of their results. Soon after the *Order* was issued, the CPB, which administers the Digital Radio Conversion Fund, announced “in light of the FCC's January 27th Order on increasing FM digital power, CPB is giving priority to applications for digital radio transmission projects that increase IBOC power levels up to the FCC allowed maximum.”⁵⁶ NTIA, for their part, announced that they would, “re-open the solicitation for [PTFP] applications ... to accommodate the increase in digital power levels of radio stations, as allowed by the provisions of the January 29, 2010, Order announced by the [FCC].”⁵⁷ NPR was not an unbiased investigator or an advocate for the public interest. As a lobbying organization, NPR’s duty is to maximize the largesse that their clients receive. And they succeeded quite well—creating a whole new paradigm for their clients to get Federal grants for capital improvements.

32. My point here is not to allege wrongdoing on the part of NPR—indeed, I allege none. Rather, my point is for the need for full public access to the rulemaking process so that everyone’s interests can be balanced. Much was made at the time about the “compromise” reached between iBiquity and NPR, as if either of them represented victim stations or their listeners. Both of them clearly saw increased sideband power as funding opportunities, which undoubtedly colored their opinions. It is the popular belief that, in Washington, lobbyists get to write the rules. Here, a lobbyist not only received preferential consideration in the drafting of the final rule, they received preferential consideration in interpreting the key engineering data upon which the rule is based. This is wrong. (Continued, next page...)

⁵⁵ See, e.g., Lobbying Report for 4Q 2009 at

<http://disclosures.house.gov/ld/pdfform.aspx?id=300157154>

⁵⁶ <http://www.cpb.org/grants/grant.php?id=258> (Visited April 24, 2010 and December 12, 2011)

⁵⁷ See [75 FR 13259–13261](http://www.federalregister.gov/?date=2010-03-19), March 19, 2010. Congress abolished the PTFP in FY 2011.

“Parties affected by administrative rules have a distinct personal interest in how they are made. An adequate opportunity to present relevant information to appropriate officials is one of the most important tools with which individuals can defend themselves against an exercise of rulemaking power that may be detrimental to their interests.”⁵⁸

D. The *Order* was Adopted in Clear Contravention of the Commission’s Rules

33. In the paragraphs above, I document that the *Order* is based on significant errors of fact and false statements, and that it was adopted without the requisite public comment on the most significant data upon which it is based. Even more remarkable is that it was adopted in clear contravention of the Commission’s rules.

34. [§ 0.283\(a\)](#) of the Commission’s rules, pertaining to the delegation of authority to Media Bureau, requires that final orders in rulemaking proceedings (other than those involving the allotment of FM and television channels) be referred to the Commission en banc for disposition. Indisputably this is not what happened—the *Order* was adopted as a final order in a rulemaking proceeding solely on delegated authority. The *Order* began as an informal inquiry in October 2008,⁵⁹ but it became a rulemaking proceeding on June 12, 2009, with the publication of notice in the *Federal Register*.⁶⁰ At Appendix C, supported by *Federal Register* publication,⁶¹ the *Order* is unequivocal in labeling its action taken as “final rule changes.” That is, it is an independent, final rulemaking order. To the extent that additional authority was delegated to

⁵⁸ Arthur E. Bonfield, “Public Participation in Federal Rulemaking Relating to Public Property, Loans, Grants, Benefits, or Contracts,” 118 U. Pa. L. Rev. 540–541 (1970), citing the *Final Report of the Attorney General’s Committee on Administrative Procedure* 102 (1941).

⁵⁹ “Comment Sought on Joint Parties Request for FM Digital Power Increase and Associated Technical Studies,” MM Docket No. 99-325, Public Notice, DA 08-2340 (MB rel. Oct. 23, 2008), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-08-2340A1.pdf

⁶⁰ See “Proposed Rule” notice, [74 FR 27985–27988](#). See also “Comment Sought on Specific Issues Regarding Joint Parties’ Request for FM Digital Power Increase and Associated Technical Studies,” MM Docket No. 99-325, Public Notice, DA 09-1127 (MB rel. May 22, 2009), http://fjallfoss.fcc.gov/edocs_public/attachmatch/DA-09-1127A1.pdf.

⁶¹ See “Final Rule” notice, [75 FR 17874–17878](#).

Media Bureau by the *Second Report and Order*, it was authority to “consider and grant routine petitions and waivers” (i.e., of existing rules), and not authority to revise rules.⁶²

35. In light of this error, I call upon Media Bureau to rescind the *Order* on its own motion. The instant request requires the *Order* for foundation, and absent valid authority for the *Order*, the instant request must be denied. Furthermore, I call upon Media Bureau to not repeat this error in the matter at hand. “The *Accardi* doctrine requires federal agencies to follow their own rules, even gratuitous procedural rules that limit otherwise discretionary actions.”⁶³

E. The *Order* is not yet Administratively Final

36. I anticipate reply comments to the effect that I am inappropriately using this comment period to reargue settled matters and matters that are out of scope of the present inquiry. Such reply comments would be wrong on both points.

37. In comment on the instant matter, no comments are more appropriate than those that provide informed challenges to the basis of the proposed action. Here, the proposed action is based in large part on the earlier *Order*, so challenges to the reliability of the *Order* are well within bounds. Furthermore, proposal at hand reopens the question of whether elevated sideband power is appropriate at all, since, as explained in the public notice soliciting these comments, “A significant number of FM stations are currently precluded from taking advantage of the full 10 dB digital power increase permitted by the *Order* due to the presence of a nearby station on one but not both of the two first-adjacent channels. If asymmetric digital sideband operation is

⁶² “*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 Rule Making, 22 FCC Rcd 10344 (2007) (“*Second Report and Order*”); electronically at http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-07-33A1.pdf. See also 72 FR 45670–45693.

⁶³ *Steenholdt v. Federal Aviation Administration*, 314 F.3d 633, 639 (D.C. Cir. 2003); electronically at [http://www.cadc.uscourts.gov/internet/opinions.nsf/D291855607FDE3D485256F82005F4689/\\$file/01-1331a.txt](http://www.cadc.uscourts.gov/internet/opinions.nsf/D291855607FDE3D485256F82005F4689/$file/01-1331a.txt).

permitted, such stations could presumably increase their digital power on the sideband away from the limiting station.”¹ I refer the Commission again to the quote in § 20 *supra* that is identified by Fn. 37. My comments go to the point that the *Order* errs in allowing digital sideband powers in excess of –23 dBc (–20 dBc total, when symmetrical), and that this error and the facts presented here are also germane to the question of allowing asymmetrical digital sideband powers when either sideband is in excess of –23 dBc.

38. Furthermore, the *Order* is hardly a settled matter—far from it. In addition to the pending applications for review, including my own, the Electronic Comment Filing System indicates that Media Bureau has received at least three petitions for reconsideration.⁶⁴ According to Commission rules, these petitions must be accorded due notice in the Federal Register, which will begin the filing window for oppositions and replies.⁶⁵ No notice has yet been given that any petitions for reconsideration were received. Thus, the Commission has not yet even begun to build the record upon which to decide whether to accept any of these petitions, or not.⁶⁶ Any decision at this juncture that reflects upon the merits of these petitions for reconsideration, and their effect upon the *Order*, would be premature, prejudicial, and unwarranted.

39. This lack of administrative finality is a bar to the consideration of the instant request. The purpose of the instant proposal to extend the *Order* by increasing opportunities to broadcast at –10 dBc (effective, one sideband), and its approval would implicitly reconsider and

⁶⁴ Petition for Reconsideration of Alan W. Jurison, <http://fjallfoss.fcc.gov/ecfs/comment/view?id=6015599952>; Comments of Mullaney Engineering, Inc. (identified in the ECFS, in the page headings, and in text as a petition for reconsideration), <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020454666>, Petition for Reconsideration of Peter and John Radio Fellowship, Inc., <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020454399>; all May 10, 2010, MM 99–325.

⁶⁵ See 47 C.F.R. § 1.429(e).

⁶⁶ There are filings on the docket that purport to be oppositions to these petitions for reconsideration. However, by rule, they are incurably premature. By the *Accardi* doctrine, the provisions of the Commission’s rule § 1.429 cannot be waived. Furthermore, two of the three filers of petitions for reconsideration have followed the rule and have not filed premature replies.

ratify the reasoning in the *Order*. This would be highly improper until the petitions for reconsideration have been given due consideration. The authors of these petitions have been waiting patiently for over a year and a half for the Commission to take even the minimal ministerial step of providing notice that the petitions were received. How could it possibly be in the public interest or proper for the Commission to now totally disregard these petitions and to bully forward as if they had no worth? The Commission should take pains to avoid this sort of prejudicial behavior. According to the notice, the issue of asymmetric sidebands first arose merely 2 ½ months ago. There is no reasonable argument why this matter should take administrative precedence over the petitions, which have been pending for over a year longer. I urge the Commission to tend to its business in the proper and logical order and to, at a minimum, hold the instant request in abeyance until the petitions for reconsideration have been answered.

III. THE COMMISSION SHOULD CLARIFY THE ALLOWANCE FOR ELEVATED SIDEBANDS, IF ALLOWED

40. While I urge the Commission to disallow digital sideband powers in excess of –23 dBc each (–20 dBc total, when symmetrical), I should nonetheless bring to the Commission's attention an inconsistency in the way the *Order* is being interpreted. Rather than allowing a maximum power of –10 dBc, or 10% of authorized analog effective radiated power for digital transmission, some industry documents are interpreting the *Order* as allowing up to –8.5 dBc, or 14% of authorized analog effective radiated power for digital transmission. The Commission should make the meaning of its rules clear and unambiguous.

41. This issue is rooted in the allowed modes for IBOC transmission: “hybrid” and various forms of “extended hybrid” operation. In “hybrid” mode, the IBOC system uses 382 subcarriers. In “extended hybrid” modes, it uses up to 534 subcarriers, an increase of 40%.⁶⁷

42. In the *First Report and Order*⁶⁸ the Commission relied on its Appendix B⁶⁹ for interim specifications of the IBOC system. This Appendix defined the subcarrier power by way of power spectral density, -41.39 dBc/kHz.⁷⁰ As I have explained (in more detail in the *Application for Review*), this corresponds to a total power of -20 dBc (1% of analog)—but only for the hybrid mode with 382 subcarriers. In the most extended hybrid mode (534 subcarriers), it corresponds to a total power of about -18.5 dBc (1.4% of analog). Initially, this difference of 0.4% was not sufficiently great to cause much concern, and since extended hybrid operation was not authorized until the *Second Report and Order* in 2007, it was a detail that flew under the radar. At elevated sideband powers, however, the difference between 10% of analog and 14% of analog is quite significant—it is obviously four times the *entire* sideband power that was initially allowed.

43. Unlike the earlier Appendix B, the *Order* specifically allows sideband powers by total power, as measured in dBc, rather than by power spectral density (dBc/kHz). Also, the *Order* is silent on its applicability to extended hybrid operation. This leads to two possible interpretations: (1) that -10 dBc is an absolute cap, regardless of operating mode, or (2) in extended hybrid modes, -10 dBc (10% of analog) actually means up to -8.5 dBc (14% of analog).

⁶⁷ See Doc. No. SY_IDD_1011s rev. G, *Id.*, at 5.4 (pp. 16–17).

⁶⁸ “*Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service*,” First Report and Order, 17 FCC Rcd 19990 (2002) (“*First Report and Order*”); electronically at http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-02-286A1.pdf.

⁶⁹ http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-02-286A2.pdf

⁷⁰ *Id.*, at Table A-3.

44. For the AICCS report, NPR labs used the first interpretation.⁷¹ However, broadcasters have adopted the latter interpretation. I refer the Commission to NRSC document G202, which provides guidance on various sideband configurations.⁷² Tables 1–5 show various percentages of analog power ranging up to 13.98% (which I have rounded to 14%, *supra*).

45. All digital sidebands are entirely in the first-adjacent channels (more than 100 kHz away from the carrier), and the interfering effects on first-adjacent stations vary depending on where in the channel the power is applied. The interference caused by the extended portion of the sidebands might be expected to cause the greater interference to the SCA channel of the first-adjacent station due to their spectral overlap.

46. In the AICCS report, NPR investigated the effect of higher powers in extended sidebands on the SCA signal of the *host* station, which for clarity is *not* the issue here.⁷³ They also studied the interference to the SCA signal of the first-adjacent station, and reported the results in Appendix B.⁷⁴ In these tests, they put an IBOC signal on the “desired” station in MP3 mode (2 out of 4 extended hybrid frequency partitions) at –20 dBc. However, it is not clear in what mode(s) the “undesired” station operated. I must also leave the interpretation of these test data to others.

47. There is little or no information to guide the Commission (or a court) as to which interpretation would be correct. The confusion over this issue is yet another reason to not allow elevated sideband powers (above –23 dBc each). Since extended hybrid operation is so

⁷¹ AICCS Report, *Id.*, at 7.3.1. Figure 36 shows the issue clearly.

⁷² National Radio Systems Committee, NRSC-G202, FM IBOC Total Digital Sideband Power for Various Configurations, September 2010; electronically at <http://www.nrscstandards.org/SG/NRSC-G202.pdf>

⁷³ AICCS Report, *Id.*, at Chapter 6

⁷⁴ AICCS Report, *Id.*, at Appendix B

commonly used, the combined effect of extended sidebands and higher powers on first-adjacent stations should be more carefully studied and documented.

IV. THE COMMISSION SHOULD ADOPT A COMPLETE TECHNICAL STANDARD

48. As the Commission is well aware, my concern goes beyond the issue of what digital sideband powers should be allowed in the IBOC system. I have made several filings on this docket since July 2005 that speak to the point that the Commission should insist upon, and adopt, a technical standard for IBOC broadcasting that comprises such full, clear, concise, and exact specifications as to enable any persons skilled in the art to which they pertain to make fully functional and compatible apparatus.⁷⁵ This is the language that is traditionally found in patent law,⁷⁶ where the objective is to remove from an invention the elements of secrecy that would prevent others from manufacturing and using it independently of the inventor (i.e., after expiration of the patent). Similar concepts are found within the realm of administrative law on the subject of specificity and vagueness. “An agency has ‘responsibility to state with ascertainable certainty what is meant by the standards’ and ‘to give sufficient guidance to those who enforce . . . , to those who are subject to civil penalties, or to those courts who may be charged to interpret and apply the standards.’”⁷⁷ Ever since IBOC broadcasting began over nine years ago, the only empowered arbiter of what meets all aspects of ‘the standard’ has been iBiquity. They alone have exclusive knowledge of all the salient technical details—it is not possible, even today, to have an

⁷⁵ See, e.g., Petition for Reconsideration of Jonathan E. Hardis, MM Docket No. 99-325, July 9, 2007; electronically at <http://fjallfoss.fcc.gov/ecfs/document/view?id=6519550109>.

⁷⁶ See [35 U.S.C. 112](#).

⁷⁷ *Georgia Pacific Corp. v. OSHRC*, 25 F.3d 999, 1005–1006 (11th Cir. 1994), <http://openjurist.org/25/f3d/999/georgia-pacific-corporation-v-occupational-safety-and-health-review-commission>; accord, *S. G. Loewendick & Sons, Inc. v. Reich*, 70 F.3d 1291, 1297 (D.C. Cir. 1995), <http://openjurist.org/70/f3d/1291/sg-loewendick-sons-inc-v-b-reich>.

independent arbiter of what the Commission allows in [§ 73.404\(a\)](#) of the its rules, and what it does not.

49. It was not supposed to be like this. In their original Petition for Rulemaking, iBiquity’s predecessor company offered that, “[t]he IBOC DAB standard should [] include all technical elements to ensure system compatibility.”⁷⁸ And they called out three areas that a complete standard must address: audio coding, digital error correction and interleaving codes, and modulation.⁷⁹ The Commission agreed, determining that adoption of a standard would facilitate the rollout of digital audio broadcasting, provide “regulatory clarity,” and “compress the timeframe for finalizing the rules.”⁸⁰ The power of the digital sidebands is but one of many aspects of the modulation portion of the standard. The audio coding portion, even today, remains an unpublished trade secret.

50. Beginning with a “Comments Sought” Public Notice issued 6 ½ years ago,⁴ the Commission received comments that documented the impasse in the standards process caused by iBiquity’s unwillingness to be forthcoming with a complete and open (that is, non-secret) standard.⁸¹ In the intervening 6 ½ years, these comments have received no consideration in any of several actions taken with respect to this broadcast service, including the *Second Report and*

⁷⁸ USA Digital Radio, *Petition for Rulemaking*, October 7, 1998 (RM-9395), at IX.D (pp. 94–96); available electronically at http://gullfoss2.fcc.gov/cgi-bin/websql/prod/ecfs/comsrch_v2.hts?ws_mode=retrieve_list&id_proceeding=RM-9395&id_submission_type=PU, more specifically, http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=2170270005.

⁷⁹ *Id.*

⁸⁰ *Digital Audio Broadcasting Systems And Their Impact On The Terrestrial Radio Broadcast Service*, Further Notice of Proposed Rulemaking and Notice of Inquiry, 19 FCC Rcd 7505 (2004) at 56; electronically at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-99A4.pdf.

⁸¹ The NRSC-5 industry standard on digital radio broadcasting has been revised since the 2005 comment period. It still covers many aspects of IBOC radio broadcasting with the notable exception of audio.

Order (which deferred the question of standards)⁸² and the sideband power *Order* under discussion now. [§ 1.425](#) of the Commission’s rules requires, *inter alia*, that “the Commission will consider all relevant comments and material of record before taking final action in a rulemaking proceeding.”

51. It’s time to get the complete standard done. In charting a path forward from here, I urge the Commission to renew a commitment to having a complete and open standard for the IBOC digital broadcasting service, and to avoid a seriatim and piecemeal consideration of its many parts. Rather than focusing on individual elements, such as digital sideband power, the Commission should apply its valuable resources towards finalizing the standard as a whole. Though the Commission is apparently reluctant to do so, it’s time to lay down the law and to insist that a complete standard is necessary, as originally promised, for the future of IBOC broadcasting. In this way, the public will finally receive the benefits that a standard will provide, including competition to lower prices and to improve the performance of the system—which has been proven to be workable at –20 dBc.⁸³

⁸² *Second Report and Order* at 12

⁸³ *Application for Review* at 5

V. CONCLUSION

52. For the foregoing reasons, the commission should deny the instant request and not allow powers on digital sidebands that exceed -23 dBc in either symmetrical or asymmetrical form. Furthermore, the commission should proceed with the essential and necessary business of adopting a complete technical standard.

Respectfully submitted,

A handwritten signature in black ink that reads "Jonathan E. Hardis". The signature is written in a cursive style with a large initial 'J'.

Jonathan E. Hardis
356 Chestertown St.
Gaithersburg, MD 20878-5724

Dated: December 19, 2011