

**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

COMMENTS OF NATIONAL PUBLIC RADIO, INC.

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Summary

NPR is committed to HD Radio and improving HD Radio coverage by increasing authorized digital sideband power. Where we differ with the Joint Parties is on the approach. An across-the-board 10 decibel ("dB") power increase fails to account for a significant increase in interference to the protected analog service of a number of stations. Based on extensive testing by NPR Labs, a managed power increase can significantly improve HD Radio coverage without sacrificing analog service.

NPR and its member stations have supported in-band, on-channel ("IBOC") digital audio broadcasting since iBiquity Digital first demonstrated the technology's feasibility. NPR has been actively engaged in developing the technology, including through pioneering work on multicasting and "accessible radio" services for the print- and hearing-impaired. NPR member stations have embraced the technology, converting to HD Radio operations in large numbers and developing new multicast services. We recognize, however, that more needs to be done to assure a successful HD Radio transition, and that includes improving HD Radio signal coverage through a *managed* power increase.

NPR reached this conclusion only after NPR Labs conducted an exhaustive 18 month study assessing the digital coverage and analog interference associated with HD Radio. NPR Labs utilized a wide range of receiving equipment, a state-of-the art radio-frequency ("RF") test bed, thousands of miles of IBOC mobile coverage data, and exacting procedures to generate and collect the most comprehensive set of consumer radio receiver data in decades. The results demonstrate that, while an across-the-board 10 dB IBOC power increase would improve HD Radio coverage, it would also cause analog interference within the protected contours of a significant number of stations.

Assuming a 10 dB power increase and hybrid operation, more than half of 49 major market stations sampled as part of the study would experience interference to 10 percent or more of the population within the station's protected service contour. More than one third would experience

interference to more than 20 percent of the population within the station's protected service contour. Of the 78 million people residing within the protected service contours of these 49 stations, better than 1 in 5, or 16.7 million people, would experience interference.

The interference itself is insidious, appearing as white noise such that an affected listener would be unable to identify its source. Although the interference sounds as though the receiver is about to lose the desired signal, listeners would not be able to tune the receiver to avoid it. The only recourse would be to endure the degraded audio or cease listening.

Interference to analog listening could be devastating to public radio stations. Listeners have come to rely on public radio programming in part for its audio quality, particularly news/talk and fine arts programming. Beyond aesthetic sensibilities, material degradation of analog service could have a direct impact on a station's financial bottom line and continued public service because listeners provide, on average, one-third of a public radio station's revenue. Many listeners reside outside of the protected service contour of the stations they support, and the interference for those listeners would be even worse.

While the extent of interference would vary among stations, that variability points up the need for a managed approach rather than an across-the-board 10 dB increase. Even the Joint Parties recognize that short-spaced Class B stations would cause interference to adjacent stations. The variation is attributable to the distance and terrain between first adjacent stations and facility size. NPR Labs has already developed simple regulatory models to establish how much of an IBOC transmission power increase individual stations can implement without causing undue interference to analog service.

In sum, NPR is convinced that an IBOC power increase is necessary. Rather than approving the requested across-the-board power increase, however, NPR urges the Commission to permit interested industry participants a modest amount of time to conduct additional testing and determine the specific parameters that would govern a more particularized approach to increasing IBOC transmission power.

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Comments of National Public Radio, Inc.

Introduction

Pursuant to Section 1.415 of the Commission's Rules, 47 C.F.R. § 1.415, National Public Radio, Inc. ("NPR") hereby submits its Comments in response to the Commission's Public Notice regarding a joint request for an FM digital power increase.¹

NPR is a non-profit membership corporation which produces and distributes noncommercial educational programming through more than 800 public radio stations nationwide. In addition to broadcasting award winning NPR programming, including *All Things Considered*[®], *Morning Edition*[®], and *Talk Of The Nation*[®], NPR's Member stations are, themselves, significant producers of news, information and cultural programming. NPR also operates the Public Radio Satellite Interconnection System and provides representation and other services to its Member stations.

¹ Public Notice: Comment Sought on Joint Parties Request for FM Digital Power Increase and Associated Technical Studies, MM Docket 99-325, rel. Oct. 23, 2008 [hereinafter "Public Notice"]. See Joint Parties, Ex Parte Presentation, filed June 10, 2008 [hereinafter "Joint Parties Request"].

I. NPR Is Committed to HD Radio and Favors A Managed Power Increase To Improve Digital Service

NPR has long supported and remains committed to the iBiquity in-band, on-channel ("IBOC") digital audio broadcasting ("DAB") technology, or "HD Radio." It offers the promise of significantly improved service to the public through enhanced sound fidelity, improved robustness, and new radio features, including the multicasting of additional program services and enhanced auxiliary services.² NPR also supports authorizing stations to increase the power of their HD Radio transmissions to improve service coverage. The power increases must be managed, however. An across-the-board increase will produce analog interference within the protected service contours of a significant number of stations if the power increase is too great, and it will produce insufficient HD Radio coverage improvement if the power increase is too little.

Just six years into the HD Radio transition,³ the radio broadcast industry has made tremendous strides. Of the approximately 14,000 commercial and noncommercial AM and FM stations licensed by the FCC,⁴ 1,830 HD Radio stations are already in operation,⁵ broadcasting 2,791 digital radio channels, with many more on the way.⁶ The Corporation for Public Broadcasting ("CPB") has awarded digital conversion grant funds to almost 700 public radio

² See Comments of National Public Radio, MM Docket No. 99-325, at 3 (filed Feb. 19, 2002).

³ In the Matter of Digital Audio Broadcasting Systems and their Impact on Terrestrial Radio Broadcast Service, First Report and Order, 17 FCC Rcd 19990 (2002).

⁴ Broadcast Station Totals as of June 30, 2008, www.fcc.gov/mb/audio/totals/index.html.

⁵ www.ibiquity.com/hd_radio/hdradio_find_a_station (accessed Dec. 3, 2008)

⁶ www.ibiquity.com/hd_radio/hdradio_find_a_station?state=SA (accessed Dec. 3, 2008).

stations to date, more than 430 public radio stations have completed the conversion and are broadcasting digitally, and, of those, 137 are offering multicast services.⁷

NPR is committed to HD Radio because the technology represents a significant step forward, allowing stations to transmit multiple services of various types and data rates and developers, such as NPR, to pioneer new categories of services and reinvent existing ones. Because public radio remains a fundamentally local medium, HD Radio offers the prospect of services even more responsive to the needs of local communities. As one example, NPR is continuing to develop "accessible radio" options for people with sensory disabilities by making traditional radio reading services available via off-the-shelf HD Radio receivers and, for the first time, by extending radio to the hearing-impaired through captioning. Indeed, one month ago, NPR offered the first radio-captioned election night broadcast coverage to groups of hearing impaired "listeners" in five cities around the country via public radio HD stations: WTMD in Baltimore, WGBH in Boston, KJZZ in Phoenix, KCFR in Denver, and WAMU in Washington, DC.⁸

Notwithstanding this progress, more needs to be done to spur consumer penetration of HD Radio receivers and assure a successful HD Radio transition.⁹ That is why NPR has endorsed including HD Radio functionality in SDARS receivers.¹⁰ For the same reason, NPR

⁷ <http://www.cpb.org/grants/grant.php?id=169> (accessed Dec. 3, 2008).

⁸ See <http://www.npr.org/about/press/2008/102118.CaptionedRadio.html> (accessed Dec. 3, 2008).

⁹ iBiquity announced only recently that it had surpassed the manufacturing milestone of 1 million HD Radio modules for retail radio receivers. Press Release: 1 Million HD Radio™ Modules Manufactured To Date (Oct. 8, 2008) available at www.ibiquity.com/press_room/news_releases/2008/1244 (accessed Dec. 3, 2008).

¹⁰ See Comments of National Public Radio, Inc., In the Matter of Development of Devices

supports authorizing radio stations to increase HD Radio power to improve coverage. For many stations, the power currently authorized for HD Radio transmissions is insufficient to serve listeners in their homes and in mobile environments. The CPB-supported NPR Labs technical study of digital coverage and interference found that, while mobile HD Radio coverage approaches parity with analog coverage, indoor and projected HD Radio portable coverage is half or less of the population of analog coverage.¹¹ Clearly, HD Radio coverage must be improved, and an IBOC transmission power increase is one of the leading methods to increase coverage.

While we believe many stations can increase power fairly significantly without undue effects, an across-the-board increase of the magnitude proposed by the Joint Parties will cause harmful interference to analog reception of a significant number of adjacent stations. That is why NPR supports a more managed approach as discussed in Section III, below. With a modest amount of additional time and testing, NPR, iBiquity Digital, and other interested entities can develop an approach that better accommodates the existing allocation of radio stations and their technical facilities.

Capable of Supporting Multiple Audio Entertainment Services Applications, MB Docket 08-172, filed Nov. 17, 2008.

¹¹ National Public Radio, Report to the Corporation for Public Broadcasting, Digital Radio Coverage & Interference Analysis, Final Report at 19 (May 19, 2008) *available at* <http://www.nprlabs.org/research/drcia.php> [hereinafter "DRCIA Report"].

II. An Across-The-Board 10 dB Power Increase Would Cause Unacceptable Interference To The Analog Service Of A Significant Number Of Stations

A. The DRCIA Study Represents A State-Of-The-Art Assessment Of IBOC Coverage And Its Potential Impact On Analog Service

The DRCIA Report represents the culmination of an exhaustive 18-month study in which NPR Labs used testing techniques generally recognized by major broadcast organizations, including the Radio Sector of the International Telecommunications Union, the Engineering Division of the British Broadcasting Corporation, and the Communications Research Centre Canada, and thoroughly documented the research. NPR Labs acquired a broad array of receivers, constructed state-of-the art test instrumentation, and utilized custom designed software to generate readily verifiable data and results. NPR Labs conducted extensive research into the effects of interference from elevated IBOC transmission power on actual stations. Currently, more than 100 FM stations have been analyzed, including more than 20 stations operating in the non-reserved portion of the FM. By precisely mapping both digital coverage and analog interference, the DRCIA Report provides the most detailed assessment to date of the potential impact on listeners of the introduction of HD Radio.

As the foundation for the coverage and interference studies, NPR Labs measured 30 analog and 15 HD Radio receivers (operating in analog mode) as well as their combined performance.¹² To collect receiver data, NPR Labs developed an automated RF test bed that collected between 3,000 and 4,000 measurement points for each receiver, representing the largest and most comprehensive collection of consumer receiver data of its kind. The compiled

¹² The ITU Recommendations applied to the receiver testing include BS.641 (“*Determination of radio-frequency protection ratios for frequency-modulated sound broadcasting*”), BS.468-4 (“*Measurement of audio-frequency noise voltage level in sound broadcasting*”), and SM.331-4 (“*Noise and Sensitivity of Receivers*”). These recommended procedures were adapted as necessary to conform to U.S. broadcast standards and Commission

data included receiver sensitivity, audio signal-to-noise ratio ("SNR") and stereo separation at all RF levels, impact of additive white Gaussian noise on audio SNR, and interference susceptibility ratios for co-channel and first-, second- and third-adjacent channels with analog signals and IBOC at 20 decibels to carrier ("dBc") and 10 dBc injection (1% and 10% of analog power, respectively). The signal link budgets published in the DRCIA Report include allowances for building loss, environmental noise and location variability in accordance with ITU-R and other standards. In determining suitable desired-to-undesired ("D/U") ratios, the criterion for impairment was determined in a controlled subjective study with 30 paid listeners using five different genres of program material to calibrate the psophometric audio SNR values.

NPR Labs employed a carefully constructed receiving environment, including antenna efficiency, Raleigh fading, signal location availability, building penetration loss, and radiofrequency noise. The DRCIA Report documents the extensive testing of indoor and portable consumer receiver antennas to determine typical efficiency. These tests were guided by a variety of sources, including the BBC Engineering Division: "*Antennas for Portable VHF-FM Receivers*", "*Dipole Antennas*", and "*The Theory of Electrically-Short Antennas*". NPR Labs drew on reports and discussion with Senior Fellows at the Visteon Corporation for information on vehicular antennas. Indoor, portable, and vehicular antennas were field-tested to verify theoretical performance values. The final values were documented in the RF link budgets published in the DRCIA Report.

To verify antenna testing and collect field strength data, NPR Labs built a custom mobile ground plane antenna. This antenna was calibrated at the Table Mountain Test Range in Boulder, Colorado, operated by the Institute for Telecommunications Sciences (ITS), the

Rules.

research and engineering branch of the National Telecommunications and Information Administration (NTIA), which is part of the U.S. Department of Commerce.¹³ NPR Labs built a custom multi-channel signal measurement package to collect mobile and portable field strength data and to model IBOC receiver performance. This measurement instrumentation was presented and discussed in papers at the IEEE Broadcast Symposium and NAB Engineering Conferences.

The interference susceptibility ratios were converted into map studies with software developed in collaboration with the ITS. NPR Labs used mobile measurements of ten public radio stations across the U.S., comprising thousands of miles of signal collection, to select the most accurate point-to-point pathloss model and calibrate the signal predictions. This provided an unprecedented level of prediction accuracy in the coverage and interference maps and the associated population studies provided to the Commission and the National Radio Systems Committee.

B. The NPR Labs Testing Demonstrates A Substantial Likelihood Of First Adjacent Interference To Analog Reception For A Significant Number Of Stations and Listeners

The results of the DRCIA study are significant. As a threshold matter, the testing confirms the technical soundness of HD Radio and the IBOC approach to digital broadcasting. At 1% IBOC transmission power, HD Radio coverage falls short of the companion analog coverage, but interference to adjacent analog service is minimal. Thus, the DRCIA study lends no support for jettisoning HD Radio and, in fact, confirms the wisdom of the Commission's decision approving it.¹⁴

¹³ <http://www.its.bldrdoc.gov/>.

¹⁴ See 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 (2002).

With respect to the proposed across-the-board IBOC transmission power increase, the study results compel a more cautious approach. For a sample of 49 major-market public radio stations, a 10 dB power increase would result in an HD Radio coverage area for mobile reception that is, on average, 117 percent of quality analog coverage, by population.¹⁵ At the same time, however, interference to mobile analog FM listening would affect an average of 26 percent of the total population served by the sampled stations.¹⁶ Interference would affect mobile reception of some stations severely: 41 percent of the stations could experience interference to one-third or more of their covered population and 18 percent would experience interference to more than half of their population.¹⁷ As requested by CPB, the impact of increased digital power are based on total population served by a quality analog or digital signal, since listeners and station supporters are not found solely within Commission designated service contours. As discussed below, significant interference is predicted to occur within the protected contour of some stations. The interference was also found to vary dramatically from one station to the next, thus supporting NPR's request for a managed regulatory policy to safeguard against the most egregious interference situations.

Based on the DRCIA study, NPR Labs developed coverage and interference maps for the same group of 49 major-market public radio stations and prepared a spreadsheet showing the non-duplicated population within each station's 1.0 mV/m (60 dB μ) protected service contour predicted to receive interference if stations increased IBOC power from -20 dBc to 10 dBc.¹⁸ For roughly half of

¹⁵ DRCIA Report at 5. A 50th station, located in Puerto Rico, was dropped because NPR lacked the necessary demographic data.

¹⁶ Id.

¹⁷ Id.

¹⁸ National Public Radio, Inc., Ex Parte Presentation, filed Oct. 6, 2008, *available at* http://www.nprlabs.org/research/drcia_maps_index.php. The stations were chosen to provide

the stations, more than 10 percent of the population within the station's protected coverage area would experience additional interference as a result of a 10 dB IBOC power increase. For more than one-third of the stations, the increase would cause additional interference to 20 percent of the population. WBUR-FM, Boston, MA is slightly above the median in this regard, and it would experience a 12.5 dB increase in the population experiencing additional interference, representing more than 500,000 of the 4,132,176 people within WBUR's protected service contour. Cumulatively, of the approximately 78 million people within the protected service contours of these 49 stations, 16.7 million would experience interference as a result of an across-the-board 10 dB IBOC power increase.

To provide a sense of how the interference might sound, NPR Labs created 2 sets of audio clips of (1) an analog signal without an adjacent IBOC transmission, (2) an analog signal in the presence of a 1st-adjacent IBOC transmission at 1 dB power, and (3) an analog signal in the presence of a 1st-adjacent IBOC transmission at 10 dB power. One set of audio clips utilizes spoken word programming and one set utilizes fine arts programming. These audio clips are accessible through the NPR Labs website, www.nprlabs.org/research, in the form of .wav files. To match "real world" conditions, the samples were prepared with a first-adjacent FM interferer at a 6 dB D/U signal ratio, which is permitted at the protected service contour under the Commission's Rules.¹⁹ Raleigh fading was employed to accurately simulate mobile reception at 60 km/hr (37 mph). An original equipment Chevy Suburban radio received the signals and provided the audio for the clips.

These sound samples show how subtle, yet disturbing the interference is: the adjacent-channel IBOC signal is heard as white noise without an attributable source. Although the program

approximately the same distribution of facilities by station class as represented by all public radio stations in the 50 largest radio markets. The population data is based on U.S. Census 2000 figures.

¹⁹ 47 C.F.R. § 73.509.

material generally remains audible, the interference creates a continuous annoyance, almost as though the receiver was on the verge of losing the desired signal. Yet, listeners would be unable to avoid the interference by tuning to the next higher or lower channel. Nor would they be able to identify the source of the interference either by reference to the content of the transmission or the identity of the interfering station.²⁰ Listeners generally do not complain about interference, they simply tune away to another station or program source.²¹ In the case of IBOC-to-analog interference, listeners are likely to assume the interference is simply a weak station signal, even in locations where they previously enjoyed good service.²²

C. Interference To Analog Reception Would Have Significant Adverse Consequences For Public Radio And Other NCE Radio Stations

As much as NPR and public radio stations are committed to HD Radio, preserving the existing analog services is essential to the millions of listeners who depend on those services. NPR's technical facilities and those of its Member stations typically utilize moderate loudness processing to preserve the natural dynamic range of the programming, particularly in the case of

²⁰ By contrast, the interference caused by unauthorized Sirius FM modulators generated significant numbers of listener complaints because listeners recognized the source of the interference. See Frank D. Roylance, "Mixed signals: If you hear Howard Stern instead of NPR, bad satellite radio equipment is to blame," *Baltimore Sun*, at 1.A, Apr. 28, 2006.

²¹ See Association of Maximum Service Telecasters, Inc., Petition for Inquiry, at 38 (filed Oct. 4, 1989) ("The increasing increments of interference permitted may not even be noticed by the average viewer who ultimately, perhaps unconsciously, watches a particular station less and less or is driven to cable, videotapes, compact discs, and the like, by the cumulative degradation of over-the-air-service.") (*citing* NAB Study of Consumer Reactions to Signal Interference, Gen. Docket No. 87-389 (March 7, 1988) [hereinafter "MSTV Petition"]).

²² As the MSTV Petition explains, consumers typically lack perfect, or even any, information about the sources of interference. See id. ("If the air pollution control district in Los Angeles receives few consumer complaints about factories emitting sulfur dioxide, that fact hardly substantiates that Los Angeles is free of that pollutant -- or, more fundamentally, that consumers are unconcerned about the existence of such pollution.").

jazz and classical music, news/talk, and special programming rich in natural, on-location sound recordings. The introduction of significant new interference to analog services would materially degrade the listening experience for the affected listeners.

Just as importantly, public radio stations are financially dependent on all their listeners. In fact, local listeners voluntarily provide one-third of a typical public radio station's budget,²³ the single largest source of station revenue,²⁴ and a share that has grown significantly larger over time.²⁵ Public radio stations thus have a direct stake in providing a service that their communities will listen to and support through voluntary financial contributions.

Materially degrading the technical quality of a station's signal is therefore more than an aesthetic issue. It would likely mean the loss of listeners because most people will simply stop listening once reception becomes poor. Even though the Commission's Rules do not protect the many listeners who reside outside the station's protected contour but heretofore have received a good quality signal, appropriate regulation of digital sideband power to protect listeners inside the service contour of neighboring first-adjacent channel stations will help limit interference to those listeners beyond the station's service contour. These listeners are an important source of financial support for public radio and other NCE radio stations. The cumulative loss of listeners could also discourage foundation and business support. Ultimately, the interference would mean

²³ Public Broadcasting Revenue, Fiscal Year 2005, Table 2 (March 2006) *available at* <http://www.cpb.org/stations/reports/revenue/2005PublicBroadcastingRevenue.pdf>. (accessed Dec. 3, 2008).

²⁴ See Who Pays for Public Broadcasting, <http://www.cpb.org/aboutpb/faq/pays.html> (accessed Dec. 3, 2008).

²⁵ Public Broadcasting Deregulation Report and Order, 98 F.C.C.2d 746, at 753 n.17 (1984) (reporting that "[p]ublic broadcasting as a whole receives about one-sixth of its revenue from individual subscribers").

diminished resources to sustain the station's service, let alone fund a robust transition to HD Radio, including the development of new HD Radio services. Particularly in difficult economic times, the consequences for some stations could be dire.

D. An Across-The-Board 10 dB IBOC Power Increase Is The Wrong Approach To Improving HD Radio Coverage

While a 10 dB IBOC power increase would improve HD Radio coverage for all stations, it would also cause varying amounts of interference to analog service among stations. The interference varies because FM stations are allocated according to RF protection ratios designed to protect interference only from analog stations. The addition of IBOC signals to a first-adjacent station adds spectral energy that is essentially co-channel to the desired analog station and is not accounted for in the Commission's Rules. Based on the interference ratios determined in the DRCIA study, increasing the transmission power of IBOC to 10 dB of the first-adjacent host will cause audible degradation to the reception of a desired station in a number of cases.

The Joint Parties request concedes that a 10 dB power increase is inappropriate for some stations. Thus, the Joint Parties acknowledge that short-spaced Class B stations would cause interference to 1st-adjacent stations with a 10 dB power increase.²⁶ Their technical showing also indicates cases of degradation to reception of other stations, particularly with speech programming.²⁷ Improving HD Radio coverage is, therefore, not simply a matter of authorizing a blanket 10 dB power increase.

²⁶ Joint Parties Request at 8.

²⁷ See iBiquity Digital, HD Radio™ System Test Report: Compatibility and Performance Tests at Elevated FM Digital Power Level, Appendix C (Consumer Testing: HD Radio System Testing at Increased Power Levels) at 8 (August 6, 2007).

That the proposed power increase of up to 10 times the present level is voluntary does not solve the problem because the stations suffering interference will have had no choice in the matter. Stations will see an improvement in HD Radio coverage and many may experience little interference to their analog signal, but their adjacent neighbors may not be so fortunate. Even if many stations defer increasing power because of cost or other reasons, moreover, analog interference will only steadily worsen over time as stations decide to increase power. Responsible stewardship of the FM spectrum cannot mean sanctioning an across-the-board power increase based on the hope that few stations will avail themselves of the opportunity.

Ultimately, an across-the-board power increase has to balance two competing objectives: (1) increasing IBOC transmission power enough to provide meaningfully improved digital coverage and (2) minimizing the power increase in vulnerable station relationships to avoid analog interference. The first objective sacrifices analog service to improve HD Radio coverage. The second objective sacrifices HD Radio coverage to avoid analog interference. Attempting to balance these objectives just so that every station can increase power to the same extent unnecessarily sacrifices one objective or the other. The better approach, we submit, is to authorize an IBOC power increase on a more particularized basis so that, depending on a given station's facilities and proximity to adjacent stations, it can maximize its HD Radio coverage improvement without causing undue analog interference to its adjacent channel neighbors.

At an earlier point in this proceeding, the Commission authorized all stations converting to HD Radio to utilize separate analog and digital transmitting antennas.²⁸ Such an across-the-board decision was appropriate because employing dual antennas in the fashion authorized allowed all

²⁸ See Public Notice: Use Of Separate Antennas To Initiate Digital FM Transmissions Approved, MM Docket No. 99-325 (Mar. 17, 2004).

stations to benefit without adverse consequences to any. In this case, the circumstances are fundamentally different.

III. NPR, iBiquity, And Others Are Working To Ascertain The Optimal Approach To Increasing Power Without Causing Undue Interference To Analog Service And The Commission Should Await The Outcome Of Those Efforts

Given the importance of improving HD Radio coverage, NPR, CPB, iBiquity, and others committed to the future of over-the-air radio broadcasting and the HD Radio transition are already discussing alternative approaches to increasing IBOC power without causing undue analog interference. NPR recognizes that any method must be manageable from a regulatory standpoint, meaning generally applicable, simple to apply, and producing predictable results. We have already developed an interference protection approach for stations in the non-reserved portion of the FM band based on distance separation and facility class. Because this model is functionally identical to the procedures prescribed in the Commission's rules,²⁹ we believe it would meet the regulatory criteria described above.

For stations in the NCE reserved portion of the FM band, we believe a prohibited contour overlap protection methodology similar to that prescribed in the Commission's rules would effectively address the issue.³⁰ The prohibited overlap method to regulate IBOC power may also apply to short-spaced stations in the non-reserved portion of the FM band and, eventually, stations that wish to employ directional IBOC transmitting antennas or transmission with asymmetrical IBOC sideband techniques to operate at greater IBOC power than would otherwise be authorized. These potential regulatory methods have been presented to the Association of Federal Communications Consulting Engineers, September 12, 2008, and at the 58th Annual

²⁹ 47 C.F.R. § 73.207.

³⁰ 47 C.F.R. § 73.509.

IEEE Broadcast Symposium, October 19, 2008.

NPR believes that while the methods for regulating IBOC power increases is proven, some ascertainment of the specific power levels may remain. For example, the public record on interference levels does not include mobile reception, which involves the temporal effects of Raleigh fading from the desired and interfering stations. Mobile reception is a major part of radio listening today, and NPR Labs' studies indicate that quality analog mobile reception is possible at the protected service contour of most FM stations, where interference from IBOC would be greatest. Thus, mobile testing would be a valuable addition to the data on IBOC interference.

NPR Labs has already begun intensive technical planning to carry out additional testing to address this and related issues in the next few months.³¹ We believe the additional data will help inform the public record and the Commission in the development of sound procedures for balancing the needs for increased IBOC coverage and maintenance of a quality FM radio service in the U.S.

We expect the necessary testing will be conducted and completed in the next several months so that we may recommend a consensus approach for increasing IBOC transmission

³¹ As one related matter, NPR Labs intends to collect data on interference from high-power IBOC to SCA subcarrier services, such as those used by approximately 100 radio reading services for the visually impaired. According to data from the International Associations of Audio Information Services Radio, reading services provide unique informational programming to approximately one million Americans. NPR Labs also intends to collaborate with Minnesota State Services for the Blind, the country's largest radio reading service, on testing the effect of IBOC on digital SCA transmissions.

NPR Labs also anticipates performing tests on extended hybrid IBOC transmission in the P11 Mode, which activates additional OFDM subcarriers. The testing would assess the effect of extended hybrid IBOC transmission on IBOC protection ratios. This transmission mode is expected from equipment manufacturers in the near future.

power while more effectively avoiding interference by the spring. This timeframe means that denying the Joint Parties power increase proposal will not significantly delay improved HD Radio service. Given the cost and complexity of implementing a 10 dB power increase,³² taking some additional time to develop a more precise approach to increasing IBOC transmission power may also benefit stations that choose to increase power. In any event, the Commission should await this further testing and industry consultation to determine a better approach to improving HD Radio service coverage.

³² Bealor, Cost Considerations for Increasing HD Radio Another 10 dB, Radio Business Report (May 28, 2008), *available at* www.rbr.com/features/intel_briefs/hd_radio_signal_bealor_cavell.html.

Conclusion

NPR is committed to the successful implementation of HD Radio and supports a managed power increase, rather than the Joint Parties across-the-board proposal, to improve HD Radio coverage without undermining existing analog service.

Respectfully submitted,

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