Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
An Inquiry Into the Commission's Policies	)	MM Docket No. 93-177
and Rules Regarding AM Radio Service	)	
Directional Antenna Performance Verification	)	

SECOND REPORT AND ORDER
AND
SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: September 24, 2008 **Released: September 26, 2008**

Comment Date: (30 days after date of publication in the Federal Register)
Reply Comment Date: (60 days after date of publication in the Federal Register)

By the Commission:

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I. INTRODUCTION

1. The *Further Notice of Proposed Rulemaking* in this proceeding[1] solicited comment on the use of moment method computer modeling[2] to demonstrate that certain AM directional antennas perform as authorized. The *Further Notice* is part of a broad-based streamlining initiative to simplify the Media Bureau's licensing procedures. In the course of this initiative, the Commission has introduced substantially shorter and simpler certification-based application forms, established new broadcast application licensing procedures, and instituted electronic filing.[3] The *Report and Order* in this proceeding simplified traditional proof of performance requirements for directional AM stations.[4] The *Further Notice* sought comment on the use of moment method modeling as a more efficient substitute for traditional field strength proofs, which are time-consuming and expensive. A subsequent Public Notice, responding to comments from an industry group, also sought comment on the related issue of using moment method programs to assess the effects of nearby towers on AM antenna patterns.[5] This *Second Report and Order* further reduces the regulatory burdens on AM broadcasters by permitting the use of computer modeling techniques to verify AM directional antenna performance. The *Second Further Notice of Proposed Rulemaking* seeks additional comment on new rules regarding tower construction near AM stations that would not depend upon the service for which a tower is used .

II. AM PROOF OF PERFORMANCE REQUIREMENTS

2. Background. There are approximately 1,900 directional AM stations currently licensed in the United States. Directional AM stations use antennas which suppress radiated field in some directions and enhance it in others. Under our current rules, an AM licensee operating with a directional antenna must perform a proof of performance to demonstrate that the antenna pattern conforms to the station's authorization. An AM station must perform a full proof to verify the pattern shape when a new directional antenna system is authorized. Partial proofs, which require fewer measurements, are occasionally necessary to show that an array continues to operate properly. Typically, a full proof requires measurement of the AM station's field strength on six to 12 critical bearings, ranging to distances of 15 kilometers or more from the antenna.[6] Making necessary antenna adjustments, selecting accessible measurement points, and taking measurements can be a daunting, slow, and expensive process. Subsequent graphical analysis of proof measurements also requires substantial time and expense.

3. This proceeding began with a *Notice of Inquiry* in response to a joint petition for rulemaking (the "Petition") filed by five broadcast consulting engineering firms ("Joint Petitioners").[7]

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[1] *See An Inquiry Into the Commission's Policies and Rules Regarding AM Radio Service Directional Antenna Performance Verification,* Report and Order and Further Notice of Proposed Rule Making, 16 FCC Rcd 5635 (2001) (*"Report and Order"* or *"Further Notice"*).

[2] Computer programs to predict antenna performance are generically referred to as "moment method" or "NEC" programs. NEC programs are based on the Numerical Electromagnetics Code moment method of analysis developed at Lawrence Livermore National Laboratory, Livermore, California.

[3] *See 1998 Biennial Regulatory Review -- Streamlining of Mass Media Applications, Rules and Processes*, Report and Order in MM Docket No. 98-43, 13 FCC Rcd 23056 (1998); 63 Fed. Reg. 70,039 (Dec. 18, 1998).

[4] 16 FCC Rcd at 5637.

[5] *See Comment Sought on Proposed Rules Permitting Antenna Modeling to Verify AM Directional Antenna Performance,* Public Notice, 22 FCC Rcd 9279 (MB 2007) ("*May 2007 Public Notice")*.

[6] *See* 47 C.F.R. § 73.186.

[7] The five broadcast consulting firms which filed the joint petition for rulemaking in 1991 are duTreil, Lundin & Rackley ("DLR"); Hatfield and Dawson Consulting Engineers, Inc. ("Hatfield & Dawson"); Lahm, Suffa & Cavell ("LSC"); Moffet, Larson & Johnson, Inc. ("MLJ"); and Silliman & Silliman.

The Petition requested that the Commission conduct a broad review of its rules for directional AM antenna performance verification, many of which have been in place for decades. As part of the review, the Joint Petitioners proposed that the Commission consider the use of computer modeling techniques for AM directional antennas. The Commission subsequently issued a *Notice of Proposed Rulemaking* (*"NPRM"*)[8] seeking comments on proposals to streamline existing requirements, including the potential incorporation of moment method techniques into our AM rules. The *Report and Order* in this proceeding streamlined the rules with respect to conventional requirements for directional AM stations, reducing the scope of work required for a directional AM proof of performance, and also eliminating other obsolete rules. The *Report and Order* observed, however, that commenters were divided as to the advisability of permitting moment method modeling as a substitute for field strength measurements. Therefore, the *Further Notice* deferred resolution of this issue and sought additional comments on the incorporation of moment method techniques.

4. In late 2006 and early 2007, an *ad hoc* technical group of radio broadcasters, equipment manufacturers, and broadcast consulting engineers, acting collectively as the AM Directional Antenna Performance Verification Coalition ("Coalition"), convened to assess previous comments and to refresh the record in the Commission's directional antenna proceeding. The Coalition's members include 24 broadcast licensees, among them the largest group owners, and ten broadcast consulting firms. On May 4, 2007, the Coalition submitted comments proposing several rule changes to the Commission in response to the *Further Notice*. The Coalition proposed rule changes to permit applicants to use moment method computer modeling to demonstrate that AM directional antennas perform as authorized. The Coalition also proposed rules to permit use of moment method modeling to assess the effects of tower construction in proximity to AM stations.

5. The Coalition proposal would allow licensees to verify antenna performance based on measurements of internal parameters, *i.e*., the current (or voltage) and phase measured at specific locations on antenna elements. These measured internal parameters would then be used in moment method programs in conjunction with a physical model of the directional antenna, represented with varying degrees of complexity as a series of wires, to compute the contribution of each antenna element to the directional pattern. The procedures recommended by the Coalition include the calibration of the model with measured impedances for each tower in the array. In order to predict the resulting directional pattern accurately, the internal array parameters which the program uses in its calculations must be carefully measured. To this end, the Coalition's proposal describes in detail the proper construction of the antenna sampling system that provides input to the modeling software. The Coalition recommended that the Commission permit but not require moment method proofs for antenna arrays using simple series-fed elements. AM stations using directional arrays consisting of top-loaded or sectionalized elements or folded unipoles would not be eligible to use moment method calculations in place of field strength measurements.

6. In addition to specifying the procedures which would constitute a moment method proof, the Coalition proposal also discusses the limitations of traditional field strength measurements to verify antenna adjustment. Field strength meters do not directly measure electric field strength. Rather, they measure the magnetic field component of the electromagnetic wave, and assume an orthogonal relationship between magnetic and electric field vectors to derive electric field strength. According to the Coalition proposal, effects from nearby conductors, reradiating objects, diffraction, and terrain anomalies often yield field strength readings that do not properly reflect the radiated pattern. The Coalition states that "moment method proofs will in many cases yield results that are superior to traditional field strength measurement proofs in terms of interference protection between stations."[9]

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[8] *In the Matter of an Inquiry Into The Commission's Policies and Rules Regarding AM Radio Service Directional Antenna Performance Verification,* Notice of Proposed Rulemaking, 14 FCC Rcd 9275 (1999) (64 FR 40535).

[9] Coalition Reply Comments at 2.

7. The Media Bureau subsequently issued a Public Notice inviting parties to comment on the Coalition's proposals submitted in response to the *Further Notice*[10] Many Coalition members filed individual comments supporting the proposals. Carl T. Jones Corporation comments that its engineers have been using the techniques proposed by the Coalition "for the setup and initial adjustment of directional antenna systems. Our experience using these techniques indicates that the methods proposed by the Coalition are sound."[11] Clear Channel Communications, Inc. also describes its favorable experience with the proposed procedures, including two recent examples in which directional arrays were located, respectively, on an island and near a mountain ridge, where field strength measurements were problematic. Crawford Broadcasting Company points out the difficulties in relying on field strength measurements, stating "[i]t is often difficult or impossible in . . . heavily developed areas to obtain meaningful data from magnetic field measurements."[12]

8. Other commenters also support the Coalition's proposal. The Association of Federal Communications Consulting Engineers ("AFCCE") supports adoption of the proposed new rules, and suggests minor changes to several rule sections. The National Association of Broadcasters ("NAB") notes that in the past, critics of moment method techniques have argued that the results were subject to misinterpretation, and were less accurate than traditional proofs. "Although there may have been some truth to this argument a decade ago, " NAB states, "moment modeling has since become the preferred choice among broadcasters, who have gained extensive experience in its use."[13] The Society of Broadcast Engineers sees the proposed rules as "a reasonable balancing of new and more efficient technologies with prudent oversight safeguards."[14]

9. Some commenters take a more guarded view of the Coalition's proposal, supporting some aspects and opposing others. Potomac Instruments, Inc. recognizes the value of method of moment techniques, but cautions that external measurements such as those taken at monitoring points are also an essential tool when, for example, antenna components malfunction. Mullaney Engineering, Inc. supports the concept of using moment method modeling, but suggests that the Commission should consider placing some additional restrictions on the circumstances in which modeling techniques are permitted to substitute for traditional field strength proofs.

10. A minority of commenters oppose the adoption of moment method techniques as the principal means of certifying directional antenna performance. According to Greater Media, Inc. and Charles A. Hecht & Associates, Inc. ("Greater Media"), while the techniques specified in the Coalition's proposal produce a directional antenna pattern that is "reasonably close" to the authorized pattern, the Coalition's procedures are not adequate in themselves for antenna performance verification. Greater Media advocates adoption of a hybrid method consisting of modeling and a set of field strength measurements similar to that required for a partial proof.[15] Several other commenters oppose adoption of the Coalition's proposal because of concerns about the method's accuracy, particularly in regard to the effects of nearby reradiators on directional antenna patterns. [16]

11. RadiOhio Incorporated observes that it is particularly difficult to adjust and maintain directional patterns with extremely deep nulls, which often characterize nighttime operation, and suggests

[10] *May 2007 Public Notice*, 22 FCC Rcd 9279.

[11] Carl T. Jones Corporation Comments at 2.

[12] Crawford Broadcasting Company Comments at 2.

[13] NAB Comments at 3.

[14] Society of Broadcast Engineers Comments at 2.

[15] Greater Media Comments at 4.

[16] *See, e.g.,* Comments of Donald L. Markley, R. Morgan Burrow, and Independent Broadcast Consultants, Inc.

that the Commission open a new proceeding to address possible changes in nighttime allocation rules. duTreil, Lundin & Rackley also suggests opening a new proceeding to examine various aspects of the Commission's AM rules. We agree that further scrutiny of long-standing AM rules may be useful, but such rule changes would be outside the scope of this proceeding. We will, however, solicit comment on possible AM rule changes in a future proceeding.

12. Discussion. We are persuaded by the arguments of the majority of commenters who conclude that moment method techniques offer an efficient and reliable means of verifying the performance of AM directional antennas. With minor changes, we will adopt the rules proposed by the Coalition, which permit use of moment method proofs as an option for AM stations using series-fed radiators. We share the view of commenters who recognize the value of some form of external measurements as part of a moment method proof. To this end, we note that the Coalition's proposal includes the requirement that a moment method proof include field strength measurements at reference locations. The reference measurements will provide a general indication– the only indication external to the antenna–that the antenna continues to function properly. We will adopt the suggestion of J.S. Sellmeyer and others that a moment method proof should include field strength measurements at three to eight locations, and that the descriptions of the measurement locations and measured field strengths shall be filed with the Form 302 covering license application. In consideration of the importance of antenna sampling system construction to the accuracy of a moment method proof, we also will require the submission of a complete description of the sampling system construction as an exhibit to Form 302. We note that AFCCE's comments include a sample form for recording the required details of sampling system construction that licensees may find useful for submission with the Form 302.

13. We acknowledge Greater Media's concern that the procedures proposed by the Coalition result in a final pattern adjustment that is close to the authorized pattern but not perfectly precise. In support of this claim, Greater Media mentions its recent experience with the adjustment of a new directional antenna pattern used by WPEN, Philadelphia, Pennsylvania. According to Greater Media, use of moment method techniques resulted in an initial adjustment that produced lower radiation at pattern minima than the standard radiation pattern values. While we respect the concern for accuracy expressed by Greater Media and other commenters, we disagree that minor differences in pattern adjustment are sufficient to disqualify moment method techniques. The uncertainties in the AM assignment process, including short- and long-term variations in directional antenna performance, seasonal changes in ground conductivities, and variations in nighttime propagation caused by sunspot activitity, are large enough to obscure any differences between two reasonable methods of directional antenna adjustment. Regarding commenters' concerns that a moment method proof will not account for the effects of nearby reradiators on the AM pattern, we acknowledge that this is a potential drawback of relying on moment method proofs, which are based on measurements internal to the antenna system. We agree, however, with the Coalition's observation that taking field strength measurements in the presence of reradiating structures may offer no more accurate a depiction of the pattern shape than moment method techniques do. Reliance on field strength measurements alone, as our present rules requires, makes compliance very difficult for many AM stations, particularly when construction and land development occur near the AM station. Earlier in this proceeding, commenters expressed concern about the number of directional arrays that are no longer operating properly. For example, du Treil, Lundin & Rackley, Inc. estimated that more than half of the AM directional antenna systems were out of adjustment.[17] We believe that adoption of moment method techniques would provide an overall benefit to the AM service by substantially reducing the cost of a proof of performance, thereby encouraging AM licensees to properly maintain directional arrays.

[17] duTreil, Lundin & Rackley November 1999 Comments at 3.

III. SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

14. Background. In AM radio, the tower itself functions as the antenna. Consequently, a nearby tower may become an unintended part of the AM antenna system, reradiating the AM signal and distorting the authorized AM radiation pattern. Thus, our rules contain several sections concerning tower construction near AM antennas that are intended to protect AM stations from the effects of such tower construction., specifically, Sections 73.1692, 22.371, and 27.63[18] These existing rule sections impose differing requirements on the broadcast and wireless entities, although the issue is the same regardless of the types of antennas mounted on a tower. Other rule parts, such as Part 90 and Part 24, entirely lack provisions for protecting AM stations from possible effects of nearby tower construction. The Coalition has proposed that the Commission adopt rules to "harmonize the disparate treatment"[19] regarding tower construction near AM stations, and also to incorporate moment method techniques in the analysis of the impact of nearby structures on the AM station.

15. Existing AM proximity rules governing wireless licensees specify fixed distances within which tower construction is presumed to affect the AM station. The Coalition's proposal, in contrast, would specify critical distances from an AM station in terms of wavelengths at the AM frequency, albeit limiting the distance to a maximum of three kilometers, as specified in existing rules for wireless licensees. The Coalition's proposal designates moment method modeling as the principal means of determining whether a nearby tower affects an AM pattern. The proposal would, however, allow traditional partial proof measurements taken before and after tower construction as an alternative procedure when the AM station in question was licensed pursuant to field strength measurements. The Coalition proposes to eliminate short towers from consideration, with critical tower heights also defined in terms of the AM wavelength. Existing rules apply to modification of towers, as well as to new tower construction near AM stations. The Coalition's proposal would define the types of tower modification that may affect AM stations, and would exclude many routine cases in which antennas are added to existing towers.

16. Nearly all commenters support the concept of a single rule that would apply to all parties constructing towers near AM stations. According to PCIA—The Wireless Infrastructure Association ("PCIA"), "[a consolidated rule] would benefit the public by ensuring consistent protection to AM stations where appropriate, while eliminating the confusion that exists today given the absence of explicit rules across all services."[20] Wireless communications industry representatives proposed several modifications to the Coalition proposal. The Coalition filed reply comments modifying its initial proposal in response to wireless industry concerns.[21] The changes simplified the definition of significant tower modifications, and clarified the procedures for modeling directional arrays with nearby reradiators. Most commenters agree substantially with the Coalition's proposal, with some suggesting additional revisions. Hatfield & Dawson supports the Coalition's proposal, but cautions that there may be unusual circumstances in which tower construction outside the proposed distances may affect an AM pattern. Hatfield & Dawson recommends that the proposed rule include a section that would protect an AM station in cases that fall outside the screening criteria.[22] AFCCE also supports the proposed new rule, and supplies a series of moment method modeling studies demonstrating the effects of towers of varying heights and distances on AM patterns. AFCCE concludes that the proposed criteria "are adequate to protect the vast majority of AM stations," but its modeling studies do show instances in which a

[18] 47 C.F.R. §§ 73.1692, 22.371, and 27.63.

[19] Coalition Comments at 3.

[20] PCIA Comments at 2. See also, e.g., Land Mobile Communications Council ("LMCC") Comments at 2.

[21] *See* Comments of PCIA, Sitesafe, Inc, and The Wireless Communications Association International, Inc. ("WCA").

[22] Hatfield & Dawson Reply Comments at 3.

directional pattern may be affected by towers which the proposed rule would exclude from study.[23] Mullaney Engineering, Inc. favors the definition of critical distances and tower heights in terms of the AM frequency, but cautions that even electrically short structures near a directional AM station may affect the pattern. Mullaney suggests reducing the height below which towers are excluded from study to 20 electrical degrees at the AM frequency.[24]

17. A minority of commenters, while advocating the consolidation of AM proximity rules, oppose the use of moment method techniques to assess the effect of a newly constructed tower on an AM pattern. Greater Media characterizes the substitution of moment method studies for field strength measurements to assess a nearby tower's effect on an AM pattern as a "gift for telecommunications providers at the expense of AM licensees and their listeners."[25] Greater Media advocates maintaining the current distances from AM stations specified in rules governing wireless licensees, and relying on field strength measurements to determine the effect of a tower on an AM pattern.

18. Discussion. We agree in substance with the Coalition's intent to harmonize and update the Commission's existing rules for tower construction near AM stations. Accordingly, we are adopting this *Second Further Notice of Proposed Rulemaking* to solicit comment from Commission licensees and other interested parties on the Coalition's proposal as explained below.

19. Proposed rules based on those advanced by the Coalition appear as Appendix E herein. We tentatively conclude that any new rules adopted should appear in Part 1 of the Commission's Rules. As proposed, the rules would apply to construction of all communications towers above a specified height, not just towers requiring notice to the Federal Aviation Administration and tower registration under Part 17. We seek comment on this proposal. We also seek comment on whether the Commission may apply the proposed rules to the owners of structures that are not otherwise subject to Commission licensing processes, i.e., with regard to structures such as towers that do no require registration and which no Commission licensee or applicant uses or proposes to use. Do such towers fall within Part 15 restrictions as incidental radiators? Alternatively, should the Commission prohibit applicants from proposing and licensees from using a tower when the owner has not complied with notice and detuning requirements?

20. We seek comment on a number of issues that could establish limits on the scope of the new rules, and the technical and/or policy grounds for such limits. Specifically, we seek comment on the proposed rule's exclusion of short towers from consideration. In this regard, we are concerned by AFCCE's modeling studies showing that a tower at the proposed threshold height of 45 electrical degrees, when located within two wavelengths of a directional antenna, may distort a directional pattern. We note that AFCCE's corresponding study for a 36-degree radiator shows little effect on the directional pattern. We tentatively conclude that the tower height triggering study and notification should be reduced to 36 electrical degrees for towers near a directional antenna. In addition, we seek comment on the types of structures, such as buildings, that should be categorically excluded from the proposed rules. Furthermore, we tentatively conclude that towers not subject to FAA or tower registration requirements should not be categorically excluded. We seek comment on these and any other provisions of the proposed rules.

21. We note Hatfield & Dawson's suggestion that the rules should include a provision to cover those unusual circumstances that would be excluded by the Coalition's proposal. For example, Hatfield & Dawson postulates a situation in which construction of a tall tower outside the proposed threshold distance changes field strength readings along a monitored radial for a station ineligible to use moment method techniques. Additionally, a short tower that would normally be excluded from study under the proposed rules may affect the operation of an AM antenna if the tower is extremely close, i.e.,

[23] AFCCE Comments, Appendix A.

[24] Mullaney Engineering, Inc. Comments at 10.

[25] Greater Media Comments at 12. *See also* Comments of R. Morgan Burrow.

within the near field of the AM antenna. In consideration of such circumstances, should any final rule on this issue, if adopted, include a provision requiring tower proponents to protect the AM station upon submission of a credible demonstration that the tower affects the AM pattern? We tentatively conclude that such a provision would be appropriate. We invite comment on these and any other issues that would harmonize the rules for any applicant proposing tower construction near an AM station, and that would extend the proposed rules to cover all communications towers.

22. We seek comment on the notification procedures to AM stations regarding planned nearby structure construction that would fall within the scope of the proposed new rules. Notice would provide an AM licensee with the opportunity to perform its own assessment of the possible effects of tower construction, including a "traditional" partial proof, if necessary. What minimum notice period should be provided before the construction of a new structure could commence? We seek comment on when notification procedures should apply. Should a tower proponent be required to notify the permittee of an unconstructed AM station? Alternatively, should notification procedures apply only when the AM station is licensed or operating pursuant to Program Test Authority (PTA) prior to construction of the nearby structure?

23. We tentatively conclude that the Commission should continue to rely on its current complaint procedures to determine whether detuning obligations have been properly fulfilled. We tentatively conclude that any new rules adopted should be applied only prospectively for towers constructed after the effective date of such new rules, i.e., where actual construction commences after the effective date. Finally, we invite comment on the proposed rules and on any other changes that would be necessary to establish uniform procedures for all communications services and all Commission regulatees with respect to communications tower construction and the effects on AM stations.

IV. CONCLUSION

24. The rules adopted herein are designed to ease licensing burdens on AM stations without sacrificing the Commission's core responsibility to promote and safeguard the technical integrity of the AM service. Similarly, the rule changes contemplated in the *Second Further Notice of Proposed Rulemaking* would use the same techniques to streamline and rationalize our rules with regard to the way in which the potential impact of construction near AM stations can be assessed. Our actions today, made possible by the support and contributions of a broad coalition of technical experts and broadcasters, represents a significant step forward in modernizing our AM licensing procedures.

V. PROCEDURAL MATTERS

A. Comment Information

25. *Ex Parte Rules*. The *Second Further Notice of Proposed Rulemaking* in this proceeding will be treated as a "permit-but-disclose" subject to the "permit-but-disclose" requirements under Section 1.1206(b) of the Commission's rules.[26] *Ex parte* presentations are permissible if disclosed in accordance with Commission rules, except during the Sunshine Agenda period when presentations, *ex parte* or otherwise, are generally prohibited. Persons making oral *ex parte* presentations are reminded that a memorandum summarizing a presentation must contain a summary of the substance of the presentation and not merely a listing of the subjects discussed. More than a one- or two-sentence description of the views and arguments presented is generally required.[27] Additional rules pertaining to oral and written presentations are set forth in Section 1.1206(b).

26. Comments and Replies. Pursuant to Sections 1.415 and 1.419 of the Commission's Rules,[28] interested parties may file comments on or before the dates indicated on the first page of this

[26] *See* 47 C.F.R. § 1.1206(b).

[27] *See id.* § 1.1206(b)(2).

[28] *See* 47 CFR §§ 1.415, 1.419.

document. Comments may be filed using: (1) the Commission's Electronic Comment Filing System ("ECFS"), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies.[29]

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://www.fcc.gov/cgb/ecfs/ or the Federal eRulemaking Portal: http://www.regulations.gov. Filers should follow the instructions provided on the website for submitting comments.
- For ECFS filers, if multiple docket or rulemaking numbers appear in the caption of this proceeding, filers must transmit one electronic copy of the comments for each docket or rulemaking number referenced in the caption. In completing the transmittal screen, filers should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions, filers should send an e-mail to ecfs@fcc.gov, and include the following words in the body of the message, "get form." A sample form and directions will be sent in response.
- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.
- Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.
- The Commission's contractor will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, NE, Suite 110, Washington, DC 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

27. Availability of Documents. Comments, reply comments, and ex parte submissions will be available for public inspection during regular business hours in the FCC Reference Center, Federal Communications Commission, 445 12th Street, S.W., CY-A257, Washington, D.C., 20554. These documents will also be available via ECFS. Documents will be available electronically in ASCII, Word 97, and/or Adobe Acrobat.

28. Accessibility Information. To request information in accessible formats (computer diskettes, large print, audio recording, and Braille), send an e-mail to fcc504@fcc.gov or call the FCC's Consumer and Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (TTY). This document can also be downloaded in Word and Portable Document Format (PDF) at: http://www.fcc.gov.

[29] *See Electronic Filing of Documents in Rulemaking Proceedings*, 13 FCC Rcd 11322 (1998).

B. Regulatory Flexibility Analysis

29. Pursuant to the Regulatory Flexibility Act of 1980, as amended,[30] the Commission has prepared a Final Regulatory Flexibility Analysis ("FRFA") of the possible significant economic impact on small entities of the policies and rules addressed in this document. The FRFA is set forth in Appendix B. A Supplemental Initial Regulatory Flexibility Analysis ("Supplemental IRFA") has been prepared in regard to the new rules proposed in the Second Further Notice of Proposed Rulemaking. The Supplemental IRFA is set forth in Appendix C.

C. Paperwork Reduction Act Analysis

30. This document contains new and modified information collection requirements and proposed new and modified information collection requirements subject to the paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, it contains new and modified "information collection burdens for small business concerns with fewer than 25 employees," pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. § 3506(c)(4). It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and OMB to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995. In regard to the proposed new information collection requirements, pursuant to the Small Business Paperwork Relief Act of 2002,[31] we seek specific comment on how we might "further reduce the information collection burden for small business concerns with fewer than 25 employees." In regard to the new and modified information collection requirements adopted herein, we previously sought specific comment on how the Commission might "further reduce the information collection burden for small business concerns with fewer than 25 employees."

31. In this present document, we have assessed the effects of the new rules for directional AM performance verification adopted herein, and find that these new rules, which are optional, would greatly reduce the information collection burden for licensees.

32. In addition to filing comments with the Secretary, a copy of any comments on the Paperwork Reduction Act information collection requirements contained herein should be submitted to Cathy Williams, Federal Communications Commission, Room 1-C823, 445 12th Street, SW, Washington, D.C., 20554, or via the Internet to Cathy.Williams@fcc.gov and to Kristy L. LaLonde, OMB Desk Officer, Room 10234 NEOB, 725 17th Street, N.W., Washington, D.C., 20503, or via the Internet to Kristy_L._LaLonde@omb.eop.gov, or via fax at 202-395-5167. For additional information concerning the Paperwork Reduction Act information collection requirements contained in this document, contact Cathy Williams at 202-418-2918, or via the Internet at Cathy.Williams@fcc.gov

D. Congressional Review Act

33. The Commission will send a copy of the *Second Report and Order and Second Further Notice of Proposed Rulemaking*, including the FRFA, in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act.[32] In addition, the Commission will send a copy of the *Second Report and Order and Second Further Notice of Proposed Rulemaking*, including the FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the *Second Report and Order and Second Further Notice of Proposed Rulemaking*, including the FRFA (or summaries thereof), will also be published in the Federal Register.[33]

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[30] 5 U.S.C. §§ 601 *et seq.*

[31] Pub. L. 107-198, *see* 44 U.S.C. § 3506(c)(4).

[32] *See* 5 U.S.C. § 801(a)(1)(A).

[33] *See* 5 U.S.C. § 604(b).

E. Additional Information

34. For additional information on this proceeding, please contact Ann Gallagher, (202) 418-2716, or Susan Crawford, (202) 418-2700, both of the Audio Division, Media Bureau.

VI. ORDERING CLAUSES

35. Accordingly, **IT IS ORDERED** that, pursuant to the authority contained in Sections 1, 4(i) 303,308, 309, 310, and 319 of the Communications Act of 1934, as amended; 47 U.S.C. §§ 151, 154(i), 303, 308, 309, 310, and 319, this *Second Report and Order and Second Further Notice of Proposed Rulemaking* **IS ADOPTED**.

36. **IT IS FURTHER ORDERED** that, pursuant to the authority contained in Sections 1, 4(i) 303, 308, 309, 310, and 319 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 303, 308, 309, 310, and 319 , 47 C.F.R. Part 73 of the Commission's Rules **IS AMENDED**, as set forth in Appendix D.

37. **IT IS FURTHER ORDERED** that the rules contained herein **SHALL BECOME EFFECTIVE** upon Commission publication of a document in the Federal Register announcing that OMB has approved them.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

List of Commenters

AM Directional Antenna Performance Verification Coalition:

Broadcasters

Beaseley Broadcast Group, Inc.
Bonneville International
Buckley Broadcasting Corporation
CBS Radio Inc.
Citadel Broadcasting Company
Clear Channel Radio
Cox Radio, Inc.
Crawford Broadcasting Company
Cumulus Media Inc.
Emmis Communications Corp.
Entercom Communications Corp.
Entravision Communications Corp.
Family Stations, Inc.
Journal Broadcast Group
Lincoln Financial Media
Morris Communications Company, LLC
Multicultural Radio Broadcasting, Inc.
Peak Broadcasting LLC
Radio One, Inc.
Regent Communications
Saga Communications
Salem Communications Corporation
The Walt Disney Company

Consulting Engineers/Equipment Manufacturers

Carl T. Jones Corporation
Cavell, Mertz & Associates, Inc.
Communications Technologies, Inc.
duTreil, Lundin & Rackley, Inc.
Edward A. Schober, P.E., Radiotechniques Engineering, LLC
Hammett & Edison, Inc.
Hatfield & Dawson Consulting Engineers, LLC
Khanna & Guill, Inc.
Radiotechniques Manufacturing, LLC
Sellmeyer Engineering

Association of Federal Communications Consulting Engineers
Broadcast Engineering and Equipment Maintenance Company
R. Morgan Burrow Jr.
Carl T. Jones Corporation
CBS Radio Inc.
Clear Channel Communications, Inc.
Cohen, Dippell and Everist, P.C.
Crawford Broadcasting Company
Communications Technologies, Inc.
Entercom Communications Corporation
Family Stations, Inc.
Georgia-Carolina Radiocasting
Greater Media, Inc. and Charles A. Hecht & Associates, Inc.
Hatfield & Dawson Consulting Engineers, LLC
Henry Communications

Independent Broadcast Consultants, Inc.
Land Mobile Communications Council
Donald L. Markley
Mullaney Engineering, Inc.
National Association of Broadcasters
PCIA – The Wireless Infrastructure Association
Potomac Instruments, Inc.
RadiOhio Incorporated
Regent Communications, Inc.
J.S. Sellmeyer, P.E.
Sitesafe, Inc.
J.L. Smith, P.E.
Society of Broadcast Engineers, Inc.
The Wireless Communications Association International, Inc.

List of Reply Commenters

AM Directional Antenna Performance Verification Coalition
Cohen, Dippell and Everist, P.C.
Communications Technologies, Inc.
Delner J. Dayton
duTreil, Lundin & Rackley, Inc.
Greater Media, Inc. and Charles A. Hecht & Associates, Inc.
Hatfield & Dawson Consulting Engineers, LLC
Multicultural Radio Broadcasting, Inc.
RadiOhio Incorporated
Edward A. Schober, Radiotechniques Engineering, LLC

APPENDIX B

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended ("RFA"),[1] an Initial Regulatory Flexibility Analysis ("IRFA") was incorporated in the *Notice of Proposed Rulemaking* (the "*Notice*") to this proceeding.[2] The Commission sought written public comment on the proposals in the NPRM, including comment on the IRFA. None were received. This Final Regulatory Flexibility Analysis ("FRFA") conforms to the RFA.[3]

A. Need for, and Objectives of, the Report and Order

2. This Report and Order adopts rules permitting the use of computer modeling techniques based on moment method analysis to verify AM directional antenna performance. Adoption of such techniques will reduce the substantial costs associated with licensing for directional AM stations. These rules also advance the Commission's regulatory requirements to the minimum necessary to achieve our policy objectives of controlling interference and assuring adequate community coverage.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA.

3. None.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

4. The RFA directs the Commission to provide a description of and, where feasible, an estimate of the number of small entities that will be affected by the rules adopted herein.[4] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small government jurisdiction."[5] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[6] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[7]

5. The rules adopted in this *Second Report and Order* will apply to those AM radio broadcasting licensees and potential licensees. that operate with directional antennas. The Small

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[1] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 *et. seq.*, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 ("SBREFA"), Pub. L. No. 104-121, Title II, 110 Stat. 847 (1996). The SBREFA was enacted as Title II of the Contract With America Advancement Act of 1996.

[2] *Exclusive Service Contracts for Provision of Video Services in Multiple Dwelling Units & Other Real Estate Developments,* Notice of Proposed Rulemaking, 22 FCC Rcd 5935 (2007).

[3] *See* 5 U.S.C. § 604.

[4] 5 U.S.C. § 603(b)(3).

[5] 5 U.S.C. § 601(6).

[6] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

[7] 15 U.S.C. § 632.

Business Administration defines a radio broadcasting entity that has $6.5 million or less in annual receipts as a small business.[8] Business concerns included in this industry are those "primarily engaged in broadcasting aural programs by radio to the public. According to Commission staff review of the BIA Financial Network, Inc. Media Access Radio Analyzer Database as of May 1, 2008, 13,457 (about 96 percent) of 13,977 radio stations in the United States have revenues of $6.5 million or less. AM stations constitute 4,776 of the radio station total, and approximately 40 percent of AM stations use directional antennas. Consequently, we estimate that 1,910 AM stations may be affected by the new rules. Using the 96 percent figure to estimate the number of small businesses among directional AM stations, we conclude that approximately 1,834 of the affected AM stations are small businesses. We note, however, that in assessing whether a business entity qualifies as small under the above definition, business control affiliations[9] must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by any changes to the ownership rules, because the revenue figures on which this estimate is based do not include or aggregate revenues from affiliated companies.

6. In this context, the application of the statutory definition to radio stations is of concern. An element of the definition of "small business" is that the entity not be dominant in its field of operation. We are unable at this time and in this context to define or quantify the criteria that would establish whether a specific radio station is dominant in its field of operation. Accordingly, the foregoing estimate of small businesses to which the rules may apply does not exclude any radio station from the definition of a small business on this basis and is therefore over-inclusive to that extent. An additional element of the definition of "small business" is that the entity must be independently owned and operated. We note that it is difficult at times to assess these criteria in the context of media entities, and our estimates of small businesses to which they apply may be over-inclusive to this extent.

D. Description of Projected Reporting, Record Keeping and other Compliance Requirements

7. In order to control interference between stations and assure adequate community coverage, directional AM stations must undergo extensive "proofs of performance" when initially constructed, and from time to time thereafter, to verify conformance with authorized operating parameters. The new proof of performance techniques adopted here, which are optional, will substantially reduce the compliance burden for licensees of directional AM stations and for Commission staff. The new compliance requirements associated with the rule changes are less onerous than our existing proof of performance requirements. The periodic recertification required for stations opting to use the new proof of performance techniques is the only new record keeping involved. We believe this requirement does not represent a significant burden, and is more than offset by the efficiency of the new procedures.

E. Steps Taken to Minimize Significant Impact on Small Entities, and Significant Alternatives Considered

8. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather

[8] *See* NAICS Code 515112.

[9] "[Business concerns] are affiliates of each other when one business concern controls or has the power to control the other or a third party or parties controls or has the power to control both." 13 C.F.R. § 121.103(a)(1).

than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[10]

9. The rules adopted in the *Second Report and Order* offer alternative procedures that will greatly reduce the compliance burden for directional AM stations. Directional AM stations are not required to use these new procedures, however. Previous rules concerning AM directional antenna performance verification remain in effect, and an AM station may continue to use the old rules if these are more advantageous. By offering a cost-effective and efficient new means of performance verification, but not requiring its use, we have increased the options available to all directional AM stations for verifying antenna performance. The additional flexibility afforded by the new rules will be particularly advantageous to small businesses.

[10] 5 U.S.C. § 603(c)(1) – (c)(4).

APPENDIX C

Supplemental Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act, as amended ("RFA"),[1] the Commission has prepared this Supplemental Initial Regulatory Flexibility Analysis ("IRFA") of the possible significant economic impact on a substantial number of small entities by the policies and rules considered in the attached *Second Further Notice of Proposed Rule Making* ("*Second Further Notice*"). Written public comments are requested on this Supplemental IRFA. Comments must be identified as responses to the Supplemental IRFA and must be filed by the deadline for comments on the *Second Further Notice*. The Commission will send a copy of the *Second Further Notice*, including this Supplemental IRFA, to the Chief Counsel for Advocacy of the Small Business Administration ("SBA").[2]

A. Need for, and Objectives of, the Proposed Rules

2. In May 2007, a coalition of broadcasters, consulting engineers, and equipment manufacturers ("AM Coalition") submitted a proposal that the Commission update and consolidate its disparate rule sections concerning tower construction near AM stations. The AM Coalition's proposed new rules for tower construction near AM stations would also incorporate moment method modeling techniques similar to those proposed for AM proofs of performance. The proposed rules regarding tower construction near AM stations, which would apply to all Commission licensees who construct towers, would simplify procedures and reduce costs. The *Second Further Notice* seeks additional comment on these proposed rules.

B. Legal Basis

3. This Notice is adopted pursuant to Sections 4(i), 303, 612, and 616 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 303, 532 and 536.

C. Description and Estimate of the Number of Small Entities To Which the Proposed Rules Will Apply

4. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[3] The RFA defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental entity" under Section 3 of the Small Business Act.[4] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[5] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[6]

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[1] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. §§ 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, 110 Stat. 857 (1996).

[2] *See* 5 U.S.C. § 603(a).

[3] 5 U.S.C. § 603(b)(3).

[4] *Id*. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies, "unless an agency, after consultation with the Office of Advocacy of the SBA and after opportunity for public comment, establishes one or more definitions of the term where appropriate to the activities of the agency and publishes the definition(s) in the Federal Register."

[5] *Id.*

[6] 15 U.S.C. § 632.

5. Nationwide, there are a total of approximately 22.4 million small businesses, according to SBA data.[7] A "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[8] Nationwide, as of 2002, there were approximately 1.6 million small organizations.[9] The term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[10] Census Bureau data for 2002 indicate that there were 87,525 local governmental jurisdictions in the United States.[11] We estimate that, of this total, 84,377 entities were "small governmental jurisdictions."[12] Thus, we estimate that most governmental jurisdictions are small.

6. **Wireless Telecommunications Carriers (except Satellite).** Since 2007, the Census Bureau has placed wireless firms within this new, broad, economic census category.[13] Prior to that time, such firms were within the now-superseded categories of "Paging" and "Cellular and Other Wireless Telecommunications."[14] Under the present and prior categories, the SBA has deemed a wireless business to be small if it has 1,500 or fewer employees.[15] Because Census Bureau data are not yet available for the new category, we will estimate small business prevalence using the prior categories and associated data. For the category of Paging, data for 2002 show that there were 807 firms that operated for the entire year.[16] Of this total, 804 firms had employment of 999 or fewer employees, and three firms had employment of 1,000 employees or more.[17] For the category of Cellular and Other Wireless Telecommunications, data for 2002 show that there were 1,397 firms that operated for the entire year.[18] Of this total, 1,378 firms had employment of 999 or fewer employees, and 19 firms had employment of 1,000 employees or more.[19] Thus, we estimate that the majority of wireless firms are small.

7. **Non-Licensee Tower Owners.** Many communications towers, while used to support

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[7] *See* SBA, Programs and Services, SBA Pamphlet No. CO-0028, at page 40 (July 2002).

[8] 5 U.S.C. § 601(4).

[9] Independent Sector, The New Nonprofit Almanac & Desk Reference (2002).

[10] 5 U.S.C. § 601(5).

[11] U.S. Census Bureau, Statistical Abstract of the United States: 2006, Section 8, page 272, Table 415.

[12] We assume that the villages, school districts, and special districts are small, and total 48,558. *See* U.S. Census Bureau, Statistical Abstract of the United States: 2006, section 8, page 273, Table 417. For 2002, Census Bureau data indicate that the total number of county, municipal, and township governments nationwide was 38,967, of which 35,819 were small. *Id.*

[13] U.S. Census Bureau, 2007 NAICS Definitions, "517210 Wireless Telecommunications Categories (Except Satellite)"; http://www.census.gov/naics/2007/def/ND517210.HTM#N517210.

[14] U.S. Census Bureau, 2002 NAICS Definitions, "517211 Paging"; http://www.census.gov/epcd/naics02/def/NDEF517.HTM.; U.S. Census Bureau, 2002 NAICS Definitions, "517212 Cellular and Other Wireless Telecommunications"; http://www.census.gov/epcd/naics02/def/NDEF517.HTM.

[15] 13 C.F.R. § 121.201, NAICS code 517210 (2007 NAICS). The now-superseded, pre-2007 C.F.R. citations were 13 C.F.R. § 121.201, NAICS codes 517211 and 517212 (referring to the 2002 NAICS).

[16] U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization," Table 5, NAICS code 517211 (issued Nov. 2005).

[17] *Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

[18] U.S. Census Bureau, 2002 Economic Census, Subject Series: Information, "Establishment and Firm Size (Including Legal Form of Organization," Table 5, NAICS code 517212 (issued Nov. 2005).

[19] *Id.* The census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

multiple antennas for Commission licensees in various services, are owned by entities which are not themselves Commission licensees. Thus, non-licensee tower owners may be subject to any new or additional requirements adopted in this proceeding. Communications towers fall into two categories: those requiring antenna structure registration, and those exempt from registration. The Commission's rules require that any entity proposing to construct an antenna structure over 200 feet or within the glide slope of an airport must register the antenna structure with the Commission on FCC Form 854.[20] As of September 3, 2008, there were 97,617 registration records in a 'Constructed' status and 13,047 registration records in a 'Granted, Not Constructed' status in the Antenna Structure Registration (ASR) database. This includes both towers registered to licensees and towers registered to non-licensee tower owners. The Commission does not keep information from which we can easily determine how many of these towers are registered to non-licensees or how many non-licensees have registered towers.[21] Regarding towers that do not require antenna structure registration, we do not collect information as to the number of such towers in use and therefore cannot estimate the number of tower owners who would be subject to the proposed new rules. Moreover, the SBA has not developed a size standard for small businesses in the category "Tower Owners." Therefore, we are unable to estimate the number of non-licensee tower owners that are small entities. We assume, however, that nearly all non-licensee tower companies are small businesses under the SBA's definition for cellular and other wireless telecommunications services.[22]

8. **Radio Broadcasting**. The Small Business Administration defines a radio broadcasting entity that has $6.5 million or less in annual receipts as a small business.[23] Business concerns included in this industry are those "primarily engaged in broadcasting aural programs by radio to the public. According to Commission staff review of the BIA Financial Network, Inc. Media Access Radio Analyzer Database as of May 1, 2008, 13,457 (about 96 percent) of 13,977 radio stations in the United States have revenues of $6.5 million or less. We note, however, that in assessing whether a business entity qualifies as small under the above definition, business control affiliations[24] must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by any changes to the ownership rules, because the revenue figures on which this estimate is based do not include or aggregate revenues from affiliated companies.

9. In this context, the application of the statutory definition to radio stations is of concern. An element of the definition of "small business" is that the entity not be dominant in its field of operation. We are unable at this time and in this context to define or quantify the criteria that would establish whether a specific radio station is dominant in its field of operation. Accordingly, the foregoing estimate of small businesses to which the rules may apply does not exclude any radio station from the definition of a small business on this basis and is therefore over-inclusive to that extent. An additional element of the definition of "small business" is that the entity must be independently owned and operated. We note that it is difficult at times to assess these criteria in the context of media entities, and our estimates of small businesses to which they apply may be over-inclusive to this extent.

10. **FM Translator Stations and Low Power FM Stations.** The proposed rule could affect licensees of FM translator and booster stations and low power FM (LPFM) stations, as well as potential

[20] 47 C.F.R. §§ 17.4(a), 17.7(a).

[21] We note, however, that approximately 13,000 towers are registered to 10 cellular carriers with 1,000 or more employees.

[22] 13 C.F.R. § 121.201, North American Industry Classification System (NAICS) code 517212. Under this category, a business is small if it has 1,500 or fewer employees.

[23] *See* NAICS Code 515112.

[24] "[Business concerns] are affiliates of each other when one business concern controls or has the power to control the other or a third party or parties controls or has the power to control both." 13 C.F.R. § 121.103(a)(1).

licensees in these radio services. The same SBA definition that applies to radio broadcast licensees would apply to these stations. The SBA defines a radio broadcast station as a small business if such station has no more than $6.5 million in annual receipts.[25] Currently, there are approximately 5904 licensed FM translator and booster stations and 831 licensed LPFM stations.[26] Given the nature of these services, we will presume that all of these licensees qualify as small entities under the SBA definition.

11. **Television Broadcasting.** The proposed rule could affect licensees of full power, low power, and television translator stations, as well as potential licensees in these services. In this context, the application of the statutory definition to television stations is of concern. The Small Business Administration defines a television broadcasting station that has no more than $13 million in annual receipts as a small business. Business concerns included in this industry are those "primarily engaged in broadcasting images together with sound."[27] According to Commission staff review of the BIA Financial Network, Inc. Media Access Pro Television Database as of May 1, 2008, 1,350 (about 77 percent) of the 1,759 full power television stations in the United States have revenues of $13 million or less. However, in assessing whether a business entity qualifies as small under the above definition, business control affiliations[28] must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by any changes to the attribution rules, because the revenue figures on which this estimate is based do not include or aggregate revenues from affiliated companies. Currently, there are approximately 4,271 licensed TV translator and booster stations, 556 Class A television stations, and 2,295 licensed LPTV stations.[29] Given the nature of these services, we will presume that all of these licensees qualify as small entities under the SBA definition.

12. An element of the definition of "small business" is that the entity not be dominant in its field of operation. The Commission is unable at this time and in this context to define or quantify the criteria that would establish whether a specific television station is dominant in its market of operation. Accordingly, the foregoing estimate of small businesses to which the rules may apply does not exclude any television stations from the definition of a small business on this basis and is therefore over-inclusive to that extent. An additional element of the definition of "small business" is that the entity must be independently owned and operated. It is difficult at times to assess these criteria in the context of media entities, and our estimates of small businesses to which they apply may be over-inclusive to this extent.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

13. The *Second Further Notice* seeks comment on proposed rules that, if adopted and implemented, may affect compliance requirements for small entities. As noted above, we invite small

[25] *See* 13 C.F.R. § 121.201, NAICS Code 515112.

[26] *See News Release*, "Broadcast Station Totals as of December 31, 2007" (rel. March 18, 2008) ("*Broadcast Station Totals*") (http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-280836A1.doc).

[27] OMB, North American Industry Classification System: United States, 1997, at 508-09 (1997) (NAICS Code 51320 which was changed to 51520 in October 2002). This category description continues, "These establishments also produce or transmit visual programming to affiliated broadcast television stations, which in turn broadcast the programs to the public on a predetermined schedule. Programming may originate in their own studio, from an affiliated network, or from external sources." Separate census categories pertain to businesses primarily engaged in produced programming. *See id.* at 502-505, NAICS code 512110. Motion Picture and Video Production; Code 512120, Motion Picture and Video Distribution, code 512191, 19 FCC Rcd 15238 (2004). Teleproduction and Other Post-Production Services, and code 512199, Other Motion Picture and Video Industries.

[28] "[Business concerns] are affiliates of each other when one business concern controls or has the power to control the other or a third party or parties controls or has the power to control both." 13 C.F.R. § 121.103(a)(1).

[29] *See Broadcast Station Totals.*

entities to comment in response to the proposed rules. Specifically, the *Second Further Notice* seeks comment on the use of moment method modeling techniques to assess the effect of nearby towers on AM radio stations. In AM radio, the tower itself functions as the antenna. Consequently, a communications tower erected near an AM station may inadvertently become part of the AM antenna system, distorting the authorized AM pattern. The *Second Further Notice* seeks comment on new rules which would consolidate the disparate rule sections currently in place, simplify the requirements of existing rules, and extend the rule to all Commission licensees constructing towers.

E. Steps Taken to Minimize Significant Impact on Small Entities, and Significant Alternatives Considered

14. The RFA requires an agency to describe any significant alternatives that might minimize any significant economic impact on small entities. Such alternatives may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[30]

15. As noted, we are directed under law to describe any such alternatives we consider, including alternatives not explicitly listed above.[31] The *Second Further Notice* seeks comment on a new method of assessing the effects of nearby tower construction on AM stations. We tentatively conclude that adoption of these proposed rules would reduce the compliance burden on most Commission licensees, and that this reduction would be particularly beneficial to small entities. We invite commenters to propose steps that the Commission may take to minimize any significant economic impact on small entities.

F. Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rules

None.

[30] 5 U.S.C. § 603(c).

[31] 5 U.S.C. § 603(b).

APPENDIX D

Final Rules

PART 73 – RADIO BROADCAST SERVICES

The authority for Part 73 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303, 334, 336.

Amend § 73.61 by revising paragraphs (a) and (b) to read as follows:

§ 73.61 AM directional antenna field strength measurements.

(a) Each AM station using a directional antenna with monitoring point locations specified in the instrument of authorization must make field strength measurements as often as necessary to ensure that the field at each of those points does not exceed the value specified in the station authorization. Additionally, stations not having an approved sampling system must make the measurements once each calendar quarter at intervals not exceeding 120 days. The provision of this paragraph supersedes any schedule specified on a station license issued prior to January 1, 1986. The results of the measurements are to be entered into the station log pursuant to the provisions of § 73.1820.

(b) If the AM license was granted on the basis of field strength measurements performed pursuant to § 73.151(a), partial proof of performance measurements using the procedures described in § 73.154 must be made whenever the licensee has reason to believe that the radiated field may be exceeding the limits for which the station was most recently authorized to operate.

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Amend § 73.68 by revising paragraph (a) to read as follows, by adding a new paragraph (b), and by redesignating the remaining paragraphs.

§ 73.68 Sampling systems for antenna monitors.

(a) Each AM station permittee authorized to construct a new directional antenna system which will be subject to a proof of performance based on field strength measurements, as described in § 73.151(a) or (b), must install the sampling system in accordance with the following specifications:

(1) Devices used to extract or sample the current and the transmission line connecting the sampling elements to the antenna monitor must provide accurate and stable signals to the monitor (e.g., rigidly mounted and non-rotatable loops and all system components protected from physical and environmental disturbances).

(2) Sampling lines for directional antennas may be of different lengths provided the phase difference of signals at the monitor are less than 0.5 degrees between the shortest and longest cable lengths due to temperature variations to which the system is exposed.

(3) Other configurations of sampling systems may be used upon demonstration of stable operation to the FCC.

(b) An AM station permittee authorized to construct a directional antenna system which will be subject to a proof of performance based on moment method modeling, as described in § 73.151(c), shall install a sampling system conforming to the requirements set forth in that section.

(c) A station having an antenna sampling system constructed according to the specifications given in paragraph (a) of this section may obtain approval of that system by submitting an informal letter request to the FCC in Washington, DC, Attention: Audio Division, Media Bureau. The request for approval,

signed by the licensee or authorized representative, must contain sufficient information to show that the sampling system is in compliance with all requirements of paragraph (a) of this section.

Note to paragraph (c): A public notice dated December 9, 1985 giving additional information on approval of antenna sampling systems is available through the Internet at http://www.fcc.gov/mb/audio/decdoc/letter/1985-12-09-sample.html.

(d) In the event that the antenna monitor sampling system is temporarily out of service for repair or replacement, the station may be operated, pending completion of repairs or replacement, for a period not exceeding 120 days without further authority from the FCC if all other operating parameters and the field monitoring point values are within the limits specified on the station authorization.

(e) If the antenna sampling system is modified or components of the sampling system are replaced, the following procedure shall be followed:

(1) Special Temporary Authority (see § 73.1635) shall be requested and obtained from the Commission's Audio Division, Media Bureau in Washington to operate with parameters at variance with licensed values pending issuance of a modified license specifying parameters subsequent to modification or replacement of components.

(2) Immediately prior to modification or replacement of components of the sampling system, and after a verification that all monitoring point values and operating parameters are within the limits or tolerances specified in the rules, the following indications must be recorded for each radiation pattern: Final plate current and plate voltage, common point current, antenna monitor phase and current indications, and the field strength at each monitoring point. Subsequent to these modifications or changes the procedure must be repeated.

(3) If monitoring point field strengths or antenna monitor parameters exceed allowable limits following the replacement or modification of that portion of the sampling system above the base of the towers, a partial proof of performance shall be executed in accordance with § 73.154 . The partial proof of performance shall be accompanied by common point impedance measurements made in accordance with § 73.54.

(4) Request for modification of license shall be submitted to the FCC in Washington, DC, within 30 days of the date of sampling system modification or replacement. Such request shall specify the transmitter plate voltage and plate current, common point current, base currents and their ratios, antenna monitor phase and current indications, and all other data obtained pursuant to this paragraph.

(e) If an existing sampling system is found to be patently of marginal construction, or where the performance of a directional antenna is found to be unsatisfactory, and this deficiency reasonably may be attributed, in whole or in part, to inadequacies in the antenna monitoring system, the FCC may require the reconstruction of the sampling system in accordance with requirements specified above.

Amend § 73.151 by revising the introductory paragraph and by adding paragraph (c) to read as follows:

§ 73.151. Directional Antenna Performance Verification

The performance of a directional antenna may be verified either by field strength measurement or by computer modeling and sampling system verification.

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(c) Computer modeling and sample system verification of modeled parameters to establish operation of a directional antenna consistent with the theoretical pattern. Each element of the directional array shall be modeled by use of a method of moments computer program, using the physical characteristics of each element to establish a model that does not violate any of the internal constraints of the computer program. Only arrays consisting of series-fed elements may have their performance verified by computer modeling and sample system verification.

(1) A matrix of impedance measurements at the base and/or feed point of each element in the array, with all other elements shorted and/or open circuited at their respective measurement locations, shall be made. The physical model of the individual antenna elements used in the computer program may be varied to match the measured impedance matrix, but the actual spacings and orientations of the array elements must be used. Towers may be modeled using individual vertical wires to represent them, or with multiple wires representing their leg and cross-member sections. The resulting model description (consisting of the length, radius, and number of segments of each wire for arrays using vertical wire sections to represent the towers, or the length, end-point coordinates, and radius of each wire used to represent leg and cross-member sections for arrays using detailed tower structure representations) as well as the assumed input feed and base region stray reactances shall be used to generate the drive impedances and sample system parameter values for the operating directional antenna pattern parameters.

(i) For arrays using vertical wires to represent each tower, the radii of cylinders shall be no less than 80 percent and no more than 150 percent of the radius of a circle with a circumference equal to the sum of the widths of the tower sides.

(ii) For arrays using multiple wires to represent leg and cross-member sections, the individual legs of the tower may be modeled at their actual diameters with appropriate interconnecting segments representing cross-members at regular intervals.

(iii) No less than one segment for each 10 electrical degrees of the tower's physical height shall be used for each element in the array.

(iv) Base calculations shall be made for a reference point at ground level or within one electrical degree elevation of the actual feed point.

(v) For uniform cross-section towers represented by vertical wires, each wire used for a given tower shall be between 75 to 125 percent of the physical length represented.

(vi) For self-supporting towers, stepped-radius wire sections may be employed to simulate the physical tower's taper, or the tower may be modeled with individual wire sections representing the legs and cross members.

(vii) The lumped series inductance of the feed system between the output port of each antenna tuning unit and the associated tower shall be no greater than 10 μH unless a measured value from the measurement point to the tower base with its insulator short circuited is used.

(viii) The shunt capacitance used to model base region effects shall be no greater than 250 pF unless the measured or manufacturer's stated capacitance for each device other than the base insulator is used. The total capacitance of such devices shall be limited such that in no case will their total capacitive reactance be less than five times the magnitude of the tower base operating impedance without their effects being considered.

(ix) The orientation and distances among the individual antenna towers in the array shall be confirmed by a post-construction certification by a land surveyor (or, where permitted by local regulation, by an engineer) licensed or registered in the state or territory where the antenna system is located.

(2)(i) The computer model, once verified by comparison with the measured base impedance matrix data, shall be used to determine the appropriate antenna monitor parameters. The moment method modeled parameters shall be established by using the verified moment method model to produce tower current distributions that, when numerically integrated and normalized to the reference tower, are identical to the specified field parameters of the theoretical directional antenna pattern. The samples used to drive the antenna monitor may be current transformers or voltage sampling devices at the outputs of the antenna matching networks or sampling loops located on the towers. If sample loops are used, they shall be located at the elevation where the current in the tower would be at a minimum if the tower were detuned in the horizontal plane, as determined by the moment method model parameters used to determine the antenna monitor parameters. Sample loops may be employed only when the towers are identical in cross-sectional structure, including both leg and cross member characteristics; if the towers are of unequal

height, the sample loops shall be mounted identically with respect to tower cross members at the appropriate elevations above the base insulator. If the tower height used in the model is other than the physical height of the tower, the sampling loop shall be located at a height that is the same fraction of the total tower height as the minimum in tower current with the tower detuned in the model. Sample lines from the sensing element to the antenna monitor must be equal in both length (within one electrical degree) and characteristic impedance (within two ohms), as established by impedance measurements, including at the open-circuit resonant frequency closest to carrier frequency to establish length, at frequencies corresponding to odd multiples of 1/8 wavelength immediately above and below the open circuit resonant frequency closest to carrier frequency, while open circuited, to establish characteristic impedance, and at carrier frequency or, if necessary, at nearby frequencies where the magnitude of the measured impedance is no greater than 200 ohms with the sampling devices connected. Samples may be obtained from current transformers at the output of the antenna coupling and matching equipment for base-fed towers whose actual electrical height is 120 degrees or less, or greater than 190 electrical degrees. Samples may be obtained from base voltage sampling devices at the output of the antenna coupling and matching equipment for base-fed towers whose actual electrical height is greater than 105 degrees. Samples obtained from sample loops located as described above can be used for any height of tower. For towers using base current or base voltage sampling derived at the output of the antenna coupling and matching equipment, the sampling devices shall be disconnected and calibrated by measuring their outputs with a common reference signal (a current through them or a voltage across them, as appropriate) and the calibration must agree within the manufacturer's specifications. A complete description of the sampling system, including the results of the measurements described in this paragraph, shall be submitted with the application for license.

(ii) Proper adjustment of an antenna pattern shall be determined by correlation between the measured antenna monitor sample indications and the parameters calculated by the method of moments program, and by correlation between the measured matrix impedances for each tower and those calculated by the method of moments program. The antenna monitor sample indications must be initially adjusted to agree with the moment method model within +/- 5 percent for the field ratio and +/- 3 degrees in phase. The measured matrix impedances must agree with the moment method model within +/- 2 ohms and +/- 4 percent for resistance and reactance.

(3) Reference field strength measurement locations shall be established in directions of pattern minima and maxima. On each radial corresponding to a pattern minimum or maximum, there shall be at least three measurement locations. The field strength shall be measured at each reference location at the time of the proof of performance. The license application shall include the measured field strength values at each reference point, along with a description of each measurement location, including GPS coordinates and datum reference.

Add § 73.155 to read as follows:

§ 73.155 Periodic Directional Antenna Performance Recertification

A station licensed with a directional antenna pattern pursuant to a proof of performance using moment method modeling and internal array parameters as described in § 73.151(c) shall recertify the performance of that directional antenna pattern at least once within every 24 month period.

(a) Measurements shall be made to verify the continuing integrity of the antenna monitor sampling system.

(1) For towers using base current or base voltage sampling derived at the output of the antenna coupling and matching equipment, the sampling devices shall be disconnected and calibrated by measuring their outputs with a common reference signal (a current through them or a voltage across them, as appropriate) and the calibration must agree with the manufacturer's specifications.

(2) For towers using base current or base voltage sampling derived at the output of the antenna coupling and matching equipment, sampling line measurements shall be made to verify the open-circuit resonant frequency closest to carrier frequency, to establish length, and also at frequencies corresponding to odd

multiples of 1/8 wavelength immediately above and below the open-circuit resonant frequency closest to carrier frequency, while open circuited, to verify their characteristic impedance. The frequencies measured must be the same as were measured in the most recent proof of performance and must demonstrate that the sampling lines continue to meet the requirements of § 73.151(c) with regard to their length and characteristic impedance.

(3) For towers having sampling loops, measurements shall be made at carrier frequency or, if necessary, at nearby frequencies where the magnitude of the measured impedance is no greater than 200 ohms with the sampling loops connected. The frequencies measured must be the same as were measured in the most recent proof of performance and the measured impedances must agree within +/- 2 ohms and +/- 4 percent resistance and reactance of the proof values.

(b) Field strength measurements shall be made at the reference field strength measurement locations that were established by the most recent proof of performance. If locations have become inaccessible or their readings contaminated by localized electromagnetic environmental changes, new locations that meet the requirements of the moment method proof of performance rules in § 73.151(c)(3) shall be established to replace them.

(c) The results of the periodic directional antenna performance recertification measurements shall be retained in the station's public inspection file.

APPENDIX E

Proposed Rules

Amend § 1 to add Subpart AA as follows:

Subpart AA. Disturbance of AM broadcast station antenna patterns.

§ 1.30000 Purpose. This rule part protects the operations of AM broadcast stations from nearby tower construction which may distort the AM antenna pattern. All parties proposing to construct or make a significant modification to an antenna tower or support structure in the immediate vicinity of an AM antenna, or proposing to install an antenna on an AM tower, are responsible for measures necessary to correct disturbances of the AM radiation pattern, if such disturbances occurred as a result of the tower construction or modification.

§ 1.30001 Definitions. For purposes of this subpart:

(a) Wavelength at the AM frequency. In this subpart, critical distances from an AM station are described in terms of the AM wavelength. The AM wavelength, expressed in meters, is computed as follows:

(300 meters)/(AM frequency in megahertz)=AM wavelength in meters.

For example, at the AM frequency of 1000 kHz, or 1 MHz, the wavelength is (300/1 MHz) = 300 meters.

(b) Electrical degrees at the AM frequency. This term describes the height of a proposed tower as a function of the frequency of a nearby AM station. To compute tower height in electrical degrees, first determine the AM wavelength in meters as described in paragraph (a). Tower height in electrical degrees is computed as follows:

[(Tower height in meters)/AM wavelength in meters)] x 360 degrees = Tower height in electrical degrees.

For example, if the AM frequency is 1000 kHz, then the wavelength is 300 meters, per paragraph (a). A nearby tower 75 meters tall is therefore [75/300] x 360 = 90 electrical degrees tall at the AM frequency.

(c) Proponent. The term proponent refers in this section to the party proposing tower construction or modification.

§1.30002 Tower construction or modification near AM stations.

(a) Construction near a nondirectional AM station. Proponents of construction or significant modification of a tower which is within one wavelength of the AM station, and is taller than 60 electrical degrees at the AM frequency, must notify the AM station at least 30 days in advance. The proponent shall examine the potential impact of the construction or modification as described in paragraph (c). If the construction or modification would distort the radiation pattern by more than 2 dB, the licensee shall be responsible for the installation and maintenance of any detuning apparatus necessary to restore proper operation of the nondirectional antenna.

(b) Construction near a directional AM station. Proponents of the construction or significant modification of a tower which is within the lesser of 10 wavelengths or 3 kilometers of the AM station, and is taller than 36 electrical degrees at the AM frequency, must notify the AM station at least 30 days in advance. The proponent shall examine the potential impact of the construction or modification as described in paragraph (c). If the construction or modification would result in radiation in excess of the AM station's licensed standard pattern or augmented standard pattern values, the licensee shall be responsible for the installation and maintenance of any detuning apparatus necessary to restore proper operation of the directional antenna.

(c) Proponents of construction or significant modification of a tower within the distances defined in (a) and (b) herein of an AM station shall examine the potential effects thereof using a moment method analysis. The moment method analysis shall consist of a model of the AM antenna together with the potential reradiating tower in a lossless environment. The model shall employ a simplified version of the methodology specified in § 73.151(c) of this chapter. The AM antenna elements may be modeled as a

series of thin wires driven to produce the required radiation pattern, without any requirement for measurement of tower impedances.

(d) A significant modification of a tower in the immediate vicinity of an AM station is defined as follows:

(1) Any change that would alter the structure's physical height by 5 electrical degrees or more at the AM frequency.

(2) The addition of one or more antennas or a transmission line to a tower that has been detuned or base-insulated.

(e) The addition or modification of an antenna or antenna supporting structure on a building shall not be considered significant.

(f) With respect to an AM station that was authorized pursuant to a directional proof of performance based on field strength measurements, the proponent of the tower construction or modification may, in lieu of the study described in paragraph (c), demonstrate through measurements taken before and after construction that field strength values at the monitoring points do not exceed the licensed values. In the event that the pre-construction monitoring point values exceed the licensed values, the proponent may demonstrate that post-construction monitoring point values do not exceed the pre-construction values. Alternatively, the AM station may file for authority to increase the relevant monitoring point value after performing a partial proof of performance in accordance with *§* 73.154 to establish that the licensed radiation limit on the applicable radial is not exceeded.

(g) Tower construction or modification that falls outside the criteria described in the preceding paragraphs is presumed to have no significant effect on an AM station. In some instances, however, an AM station may be affected by tower construction notwithstanding the criteria set forth above. In such cases, an AM station may submit a showing that its operation has been affected by tower construction or alteration. If necessary, the Commission shall direct the tower proponent to install and maintain any detuning apparatus necessary to restore proper operation of the AM antenna.

§ 1.30003. Installations on an AM antenna.

(a) Installations on a nondirectional AM tower. When antennas are installed on a nondirectional AM tower the AM station shall determine operating power by the indirect method (see §73.51). Upon the completion of the installation, antenna impedance measurements on the AM antenna shall be made. If the resistance of the AM antenna changes, an application on FCC Form 302-AM (including a tower sketch of the installation) shall be filed with the Commission for the AM station to return to direct power measurement. The Form 302-AM shall be filed before or simultaneously with the filing of any license application covering a broadcast station installation.

(b) Installations on a directional AM array. Before antennas are installed on a tower in a directional AM array, the proponent shall notify the AM station so that, if necessary, the AM station may determine operating power by the indirect method (see § 73.51) and request special temporary authority pursuant to § 73.1635 to operate with parameters at variance in order to maintain monitoring point field strengths within authorized limits. For AM stations licensed via field strength measurements (see § 73.151(a)), a partial proof of performance (as defined by § 73.154) shall be conducted both prior to the commencement of construction and upon completion of construction to establish that the AM array has not been adversely affected. For AM stations licensed via a moment method proof (see § 73.151(c)), the proof procedures set forth in § 73.151(c) shall be repeated. The results of either the partial proof of performance or the moment method proof shall be filed with the Commission on Form 302-AM before or simultaneously with any broadcast license application associated with the installation.