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

MM Docket No. 87-121

In the Matter of

Amendment of Part 73 of the Commission's Rules to Permit Short-Spaced FM Station Assignments by Using Directional Antennas. RM-6015

MEMORANDUM OPINION AND ORDER

Adopted: August 28, 1991; Released: September 17, 1991

By the Commission: Commissioner Quello dissenting.

INTRODUCTION

1. Before the Commission are six petitions for reconsideration of the *Report and Order* ("*Report*") in this proceeding.[1] The *Report* adopted rules that permitted routine authorization of FM stations at nominally short-spaced transmitter locations as long as other stations are protected from interference. Two of the petitions request that the Commission's action be set aside; the remaining petitions support the basic decision but suggest refinements to the rules adopted. After careful consideration of the issues raised in these petitions, we reaffirm our decision to allow routine short-spaced FM assignments, but adopt several of the requested refinements.

BACKGROUND

2. The purpose of this proceeding was to consider technical methods by which FM station licensees could be afforded greater flexibility in the selection of antenna sites. These methods are utilization of directional antennas, reduction in operating facilities (effective antenna height and or transmitting power) and taking advantage of average terrain elevation in pertinent directions.

3. We initiated this proceeding in April, 1987, with a *Notice of Inquiry* ("*Inquiry*") to explore the possible use of directional antennas to allow assignment of FM broadcast facilities at short-spaced transmitter locations.[2] We noted that the FM service had developed into the largest and most popular aural service, and that future improvement of FM service may depend in part upon licensees having greater freedom in selection of antenna sites, including consideration of potential sites that do not meet the domestic minimum distance separation requirements in the rules.[3] We requested information needed to determine whether the technical characteristics of directional FM antennas could enable licensees to use short-spaced antenna sites and still provide protection to other FM stations' service.

4. Comments received in response to the *Inquiry* generally supported short-spaced antenna sites in the FM service, but urged that the Commission proceed cautiously in permitting such assignments in order to avoid increasing interference in the FM service. The comments also agreed that spacing requirements should be retained in the FM channel allotment process. After considering these comments, we concluded that we should propose changes to our rules to allow short-spaced FM assignments in certain limited situations. Accordingly, in February 1988, we adopted a *Notice of Proposed Rule Making* ("*Notice*")[4] proposing to amend Part 73 of the rules to allow FM short-spacing based on the established prohibited contour overlap assignment techniques used for non-commercial educational FM ("NCE-FM") stations operating in the portion of the FM band that is reserved for NCE-FM operations.[5]

5. The record developed in response to the *Notice* gave further support for the concept of greater flexibility in FM site selection. However, some commenters assumed that our proposal was considerably more far-reaching than we envisioned. Thus, in the *Report*, we stated that we were taking a conservative approach to the introduction of routine short-spacing in the FM service.[6] We discussed the major technical and administrative issues raised by commenters, and after considering these viewpoints, we adopted specific amendments to Part 73 of our rules to permit authorization of short-spaced antenna sites. These rule amendments became effective on June 26, 1989.

THE PETITIONS FOR RECONSIDERATION

6. The Association for Broadcast Engineering Standards, Inc. ("ABES"), du Treil, Lundin & Rackley, Inc. ("dLR"), Genesis Broadcasting, Inc. ("Genesis"), Greater Media, Inc. ("Greater Media"), Mullaney Engineering, Inc. ("Mullaney") and the National Association of Broadcasters ("NAB") filed petitions for reconsideration of the *Report and Order*. Comments supporting and/or opposing the petitions for reconsideration were filed by the following parties: the Association of Federal Communications Consulting Engineers ("AFCCE"), John F. X. Browne & Associates ("Browne"), JAB Broadcasting Corporation ("JAB"), the National Association of Broadcasters ("NAB"), WHOK Incorporated ("WHOK") and WTRJ Broadcasting, Inc. ("WTRJ"). Additionally, on May 11, 1990, NAB joined with ABES, dLR, Greater Media and Mullaney in filing a "Consensus and Joint Supplement to Petitions for Reconsideration" ("Consensus"). This resulted in the Commission's issuing a June 22, 1990, Public Notice reopening the proceeding to obtain additional pub-

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[1] *See Report and Order,* MM Docket No. 87-121, 4 FCC Rcd 1681 (1989).
[2] *See Notice of Inquiry,* MM Docket No. 87-121, 2 FCC Rcd 3141 (1987).
[3] *See* 47 CFR Section 73.207(b)(1), Table A.
[4] *See Notice of Proposed Rule Making,* MM Docket No. 87-121, 3 FCC Rcd 1820 (1988).
[5] The first 21 channels in the FM band are available for assignment only to NCE-FM stations. *See* Sections 73.501 and 73.509 of the Commission's Rules.
[6] *See Report* at paragraph 22.

lic comment. The deadline for filing comments on the Consensus was July 20, 1990, with reply comments due on or before August 3, 1990. NAB filed additional comments and dLR filed reply comments in response to the Public Notice.

DISCUSSION OF ISSUES

Issue 1: Whether the decision providing for FM directional antenna operation should be reversed

7. ABES and NAB request that the decision to permit FM directional antenna operation be set aside.[7] NAB asserts that the Commission ignored the notice requirements of the Administrative Procedures Act, 5 U.S.C. 553(b), by failing to give adequate notice that rules might be adopted which would establish limits on the use of contour protection, affect NCE-FM stations, and employ the use of terrain shielding to make short-spaced FM assignments.[8] It further claims that the Commission acted arbitrarily and capriciously by taking inconsistent positions with respect to the merits of directional antennas.[9] NAB also alleges that the Commission committed "manifest error" and made material omissions when it failed to include in its contour protection scheme "key regulations and policies" essential to protect FM stations from interference.[10] NAB urges the Commission to suspend action taken in the *Report* and to afford an opportunity for public comment on issues related to FM shortspacing by use of directional antennas. The need for additional rule making is supported by the Consensus, although the primary thrust of the Consensus is the need to improve and refine the current rules.

8. ABES opposes any exemption from the rules requiring minimum distance separations between co-channel and adjacent-channel FM stations. ABES argues that the rules adopted in the *Report* undercut these spacing requirements, and that any use of directional antennas to permit short-spaced FM assignments should be limited to case-by-case resolution of site availability problems not solvable by any other means. Specifically, ABES suggests limiting the authorization of FM directional antennas to situations involving the loss of a transmitter site, alleviation of adverse environmental conditions or resolution of FAA coordination problems. ABES further states that if directional antennas are to be relied upon to prevent interference, the Commission should strengthen its requirements regarding the design and installation of such antennas.[11] ABES believes that the Commission is abandoning the practice of making channel allotments based on distance separation requirements in favor of contour protection and that no consideration was given to the implications of such an action in regard to the Commission's responsibility to provide a fair, efficient and equitable distribution of radio facilities under Section 307(b) of the Communications Act of 1934, as amended.[12]

9. ABES also claims that the Commission adopted rules providing short-spaced FM assignments based on terrain shielding and terrain roughness, without providing notice that these factors would be considered.[13] ABES apparently believes that the requirement for determining antenna HAAT in particular directions is the same as utilizing "terrain shielding" or a "terrain roughness factor."[14] ABES asserts that these terrain considerations were not discussed in the *Notice*. Thus, it claims that adequate notice on this matter was not given and the entire *Report* is "fatally" flawed. NAB agrees with ABES stating that the Commission should not have adopted a terrain shielding rule without giving proper notice under the Administrative Procedures Act.

10. The remaining petitioners for reconsideration (dLR, Greater Media, Genesis and Mullaney), as well as other parties filing comments, while raising a variety of technical problems deriving from the new rules, support the Commission's intent in permitting more general use of FM directional antennas.

11. Greater Media, for example, believes that the *Report* reflects a measured approach to the sensitive issue of short-spacing, which balances the needs of licensees for site flexibility with the reasonable expectations of other licensees and the listening public.[15] JAB rebuts NAB's allegation that inadequate notice of the proposed rules was given[16] and affirms that in protecting the service of existing stations, limits on the protection of their contours is a necessary concomitant.[17] JAB also notes that terrain shielding Commission as long as FM stations have been authorized and that the Commission's failure to explicitly discuss it in the *Notice* is roughly akin to failing to mention that service areas are dependent upon antenna height and effective radiated power.[18] It also argues against those who believe that the authorization of FM directional antennas constitutes the "AMization" of the FM band, noting that the disparity between the two services is too obvious to belabor. Such an argument, JAB believes, is merely a thinly disguised argument for retention of the *status quo*, because without contour protection and directional antennas, and with limitation of height and terrain considerations, there can be no expansion of FM services throughout the country other than by new allotments,

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[7] NAB subsequently filed a Motion for Stay of the new rules on April 24, 1989, which was denied by *Order*, DA 89-673, adopted June 14, 1989.

[8] *See* NAB *Petition for Reconsideration* at 6.

[9] *Id.* at 9.

[10] *Id.* at 12.

[11] *See* ABES *Petition for Reconsideration* at 1-2 and 4.

[12] *Id.* at 3 and 9.

[13] *Id.* at 6.

[14] *Terrain shielding* refers to the effect of a substantial obstruction (such as a mountain range) on signal intensity at a point beyond the obstruction. The Commission has not adopted any rules providing for regular use of terrain shielding for any purpose in the commercial FM service. The *terrain roughness factor* is an adjustment to the F(50,50) propagation charts in Section 73.333 of the rules to compensate for the difference between the "average" terrain roughness on which these charts are based (50 meters) and the actual "roughness" of the terrain profile in a particular situation. The FM rules have contained provisions for this factor for many years (*see* Section 73.313(i) and (j)), but the effective date of these provisions was stayed indefinitely in 1977, pending further review by the Commission. Neither shielding nor roughness was incorporated in the rules permitting short-spacing.

[15] *See* Greater Media petition at 1.

[16] *See* JAB comments at 2.

[17] *Id.*

[18] *Id* at 3.

which may only be created in limited numbers.[19] In a similar vein, WTRJ argues that directional antenna rules which permit small short-spacings are in the best interest of the broadcast industry and will permit service to the public that would not be possible without the flexibility provided.[20]

12. The rules adopted in the *Report* do not represent a departure from traditional methods of contour protection. They are largely based on an accurate determination of the antenna height above average terrain ("HAAT") in critical directions and they reflect essentially the same method for determining HAAT that we have used for years in the non-commercial FM service and the Low Power TV service. Contrary to the assertions of ABES and NAB, our rules for determining antenna HAAT for short-spaced FM facilities do *not* include provisions for the use of either terrain shielding or a terrain roughness factor. Instead, we have taken the well-established procedures currently required in the NCE-FM service and the Low Power TV service and adapted them for use in calculating protected and interfering contours for short-spaced FM station assignments.[21] Adequate notice of the HAAT rules adopted was given because the *Notice* clearly proposed use of predicted field strength contours as in the NCE-FM service, and the position of such contours in that service are now and have always been based on calculations of antenna HAAT in specific directions. Thus, the rules adopted in the *Report* do not implement a novel method of "terrain shielding" or use of a "terrain roughness factor," but rather, represent another application of a method already used in other services. Therefore, we will deny the request of ABES and NAB petitions that the rules be set aside on the basis of alleged use of terrain shielding and roughness.

13. With respect to the impact of contour protection on our general allotment rules, we have held throughout this proceeding that no change has been made or will be made in the FM channel allotment process. All proposals for channel allotments must meet the minimum distance separations of Section 73.207 of our rules with respect to other existing and prospective stations. All station assignments are still bound by the requirement of Section 73.315(a), which requires a minimum field strength of 3.16 millivolts per meter over the principal community to be served. Therefore, these rules do not alter the service obligations of licensees. Consequently, the use of directional antennas permitted by our rules is not inconsistent with the mandate of Section 307(b). Therefore, we will deny that part of ABES's petition for reconsideration concerning the impact of FM directional antennas on the current FM channel allotment process.

14. While the *Report* clearly stated that no change was being made to the FM channel allotment process in this proceeding, Mullaney Engineering asserts that this point is not clearly expressed in paragraph (a) of Section 73.207 and that this could easily be misunderstood by the public. Upon review of that particular paragraph, we agree with Mullaney that the existing wording of paragraph (a) of Section 73.207 could be misinterpreted. Thus, we are making a minor editorial change to avoid misunderstanding.

15. Because contour protection has been used for many years in the NCE-FM broadcast service, we anticipated that there would be little question of its validity as a station assignment methodology. In the *Report,* we noted that contour protection takes into account the differences in elevations of the terrain surrounding stations, whereas the distance separation requirements are based on average terrain assumed to be uniform in all compass directions. We observed that this failure to account for variations in the HAAT as a function of direction means that the separation requirements sometimes overprotect, and at other times, underprotect FM service. Thus, contour protection is a more accurate approach to making FM assignments. Consequently, we did consider this matter in the *Report* and thus must reject NAB's assertion that the Commission did not consider whether contour protection would adequately protect the FM service.

16. The foregoing discussion describes the general engineering principles that underlie the FM directional antenna rules and demonstrates their origin in previously used and well-tested station assignment practices. Our experience in working with the new rules since their adoption also convinces us that they are effective in resolving cases requiring transmitter site flexibility without any adverse impact on the FM channel allotment process.

17. With respect to the NAB and ABES allegations that we did not provide adequate notice of our proposals, we note that 5 U.S.C. 553(b)(3) requires only that agencies give notice of "either the terms or substance of the proposed rule or a description of the subjects and issues involved." NAB is correct that when the Commission proposed to relax its spacing rules to permit short-spacing where contours were protected, it did not suggest that some spacing limits would still be maintained. In response to concerns expressed by commenters, including NAB, that this approach might cause objectionable interference, the Commission took a somewhat more cautious approach and retained some spacing requirements. Such a decision is well within the scope of the *Notice* and self-evidently a "logical outgrowth" therefrom. *See Small Refiner Lead Phase-Down Task Force v. EPA,* 705 F. 2d 506, 547 (D.C. Cir. 1983). With respect to NAB's suggestion that there was insufficient notice that non-commercial FM stations might be affected, presumably because short-spacing to non-commercial stations might be permitted, paragraph 12 of the *Notice* indicated that short-spacing would be permitted to "adjacent and co-channel stations and allotments...." 3 FCC Rcd at 1821. Some non-commercial stations and allotments are, of course, adjacent to commercial stations. Thus, it was self-evident in the *Notice* that such non-commercial stations could be affected. Indeed, NPR recognized in its comments that some non-commercial stations would be affected. Finally, as indicated above in paragraph 12, we have not allowed the routine use of terrain shielding or terrain roughness. In footnote 15 of the *Inquiry* we specifically declined to consider terrain roughness in this proceeding. Terrain variation is a fundamental component of the contour determination process, an issue discussed in paragraph 15 of the *Inquiry* and paragraph 24 of the *Notice*. In view of

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[19] *Id* at 3-4.

[20] *See* WTRJ comments at 2.

[21] However, as stated in the *Report,* the overall HAAT will be computed in accordance with the traditional eight-radial procedure for purposes of station authorization. Overall HAAT is used for determining station class and maximum power limit.

the extensive description of the subject in both the *Inquiry* and the *Notice,* we find that the notice requirements of the Administrative Procedures Act were legally satisfied.[22]

18. We turn next to considering various refinements to the FM directional antenna rules suggested by the petitioners and commenters. Generally, these issues require only brief discussion.

Issue 2: Whether the "next lower class" limitations in Section 73.215(e) should be replaced by a fixed limit on short-spacing

19. Currently, Section 73.215(e) limits the amount of short-spacing permissible using FM directional antennas. A table in that section sets forth distance minima that are derived from those of stations of the next lower class for co-channel and first, second and third adjacent channels. These limits were selected because we believed they would provide a modest but nonetheless useful basis for some flexibility in site selection. In order to minimize the burden on our processing staff and to identify any unforeseen problems associated with processing these applications, the table was qualified by a note temporarily limiting the short-spacing in any case to not more than 8 kilometers (5 miles).

20. Comparing the new permitted minimum short-spaced distances given in Section 73.215(e) with the normal separation distances listed in Section 73.207(b)(1), dLR observes that many facilities with second and third-adjacent channel spacing problems will receive little or no benefit. dLR cites examples in which stations would be better served under the previous Commission policies, because under those policies, there was a possibility that the Commission would authorize a short-spaced antenna location by waiver. dLR contends that the general requirement for complying with the spacing requirement of the next lower class should be eliminated. dLR also recommends, apart from the temporary 8 kilometer limitation, that there should be no distance restrictions as long as interference to another facility (with assumed maximum facilities if not so operating) is not created or increased.

21. Comments from AFCCE also note that new permitted short-spacings listed for most co-channel and first adjacent channel stations range from approximately 20 to 40 km. However, for second and third adjacent stations, AFCCE notes the allowable short-spacing in most cases is from 0 to 3 km, with only two instances of 5 km short-spacing, and one instance of 12 km shortspacing. As a result of the new short-spacing restrictions, AFCCE also believes that there will be numerous instances in which FM stations could relocate only a very small amount, if at all. In addition, AFCCE notes that the table in Section 73.215(e) contains numerous discrepancies. AFCCE agrees with the petitioners that the new short-spacing criteria based on "the next lower class of station," creates serious limitations. AFCCE suggests that many simpler and equally valid schemes to limit short-spacing exist, such as using 15% of the full spacing for each class.

22. The table in Section 73.215(e) gives one minimum short-spaced separation distance for each class pair regardless of the class of station to be short-spaced. Problems occur when we mix classes, *e.g.* B to C.[23] Also, flexibility for second and third adjacent channels is modest because spacings are tight to begin with. Moreover, since the adoption of these new shortspacing distances, the Commission created an additional intermediate C3 class of FM broadcast station for Zone II with maximum facilities of 25 kW effective rated power at 100 meters reference height above average terrain, and has also increased the maximum permitted power for Class A stations, including increased minimum separation distances with respect to Class A stations.[24] Prior to creation of the Class C3 stations, Class A station status was the next lower class from a Class C2 station that might propose to short-space its facilities; now, Class C3 is the next lower station classification in such situation. Also, with the Class A power increase provisions, the previously permitted amount of short-spaced separation has been reduced towards Class A stations. Thus, portions of the table in Section 73.215(e) need updating.

23. Many of the other petitioners and commenters also believe that the limits in the Section 73.215(e) table are arbitrary and unduly restrictive (particularly in the case of second and third adjacent channel separations). There appears to be some agreement that a fixed limit should be applied. The most popular limit mentioned is 8 kilometers (5 miles), or 15% of the required distance separation (AFCCE). Eight kilometers is, of course, the limit currently imposed by what was intended as a temporary note to the table in Section 73.215(e). However, we believe that we should continue to strike a balance between the 8 kilometer initially imposed and the essentially unrestricted limit suggested by dLR. Therefore, we believe that the "next lower class" approach continues to be the most suitable limit at this time. Accordingly, Section 73.215(e) will be updated to reflect changes in the station classes that have occurred since its adoption and to consistently reflect that the amount of short-spacing permitted is the lesser value obtained by referring to Table A in Section 73.207.[25]

Issue 3: Whether the Commission should reinstitute waivers of Section 73.207

24. We concluded, in the *Report,* that the new FM short-spacing rules would permit us to discontinue granting waivers of Section 73.207 for co-channel and adjacent channel short-spacing. Greater Media urges us, however, to reconsider this policy change. Greater Media claims

[22] We have also addressed this issue and reached a similar conclusion in the *Order Denying Stay Request* adopted June 14, 1990, which also responded to allegations of inadequate notice made by NAB in it Motion for Stay. *See* paragraphs 8 and 9 of that *Order.*

[23] Thus, for a Class C to Class B co-channel short-spacing, we find that the next lower class limit of Class C1 to Class B spacing is 270 km. The next lower class limit for Class B1 to Class C spacing is 259 km. In the interest of uniformity, we chose the greater of the two values and specified 270 km in Section 73.207(e).

[24] *See* MM Docket No. 88-375, *First Report And Order,* 4 FCC Rcd 2792 (1989) and *Second Report And Order,* 4 FCC Rcd 6375 (1989).

[25] We note that action taken in the *Second Report and Order* in MM Docket No. 88-375 exempts certain Class A stations from the 8 km short-spacing limit. This decision was affirmed on reconsideration in that proceeding and the instant action does not alter that result.

that over the years, such waivers for minor, though not necessarily *de minimis,* short-spacing have well served licensees and the public by encouraging multi-station co-location of facilities and the use of shared antenna systems in many metropolitan areas. In a typical multi-user common antenna system, an omni-directional antenna is shared by a number of area stations. Greater Media suggests that most metropolitan facilities are tightly hemmed in by a number of co-channel and adjacent channel stations, many of which were allotted and/or improved in the past under much more lenient short-spacing standards.[26]

25. Greater Media further notes that the necessary reduction of power would automatically trigger the condition that these stations henceforth would only be protected to the extent of their diminished coverage contours. Greater Media states that this result is unacceptable to it and other affected stations, and would certainly discourage desirable co-location of facilities in metropolitan areas. Thus, under these circumstances, Greater Media suggests that the continued ability of stations to seek waivers for very minor short-spacings, subject to a showing of need, should be an essential component of the Commission's scheme to increase licensees' flexibility in site selection.

26. Greater Media argues that it is unfair and unrealistic to expect voluntary diminution of coverage and protection by a group of licensees in a major metropolitan area, yet this is the impact it sees of the change in waiver policy. Greater Media stresses that the difficulties, as well as the benefits of re-siting FM radio facilities are greatest in metropolitan areas, and multi-user antennas in many cases provide the only practical option &available to licensees from both a logistical and financial standpoint. Greater Media, therefore, suggests that the Commission should not foreclose the waiver option by exacting diminished signal contours which could benefit many licensees in maintaining and enhancing service to the public in areas where site selection is particularly constrained. For these reasons, Greater Media concludes that the Commission should rescind its "no waiver" policy concerning this issue. At the very least, Greater Media requests that the policy of routinely permitting short-spacings of up to one mile be retained.

27. The FM directional antenna rules were developed in order to permit stations to short-space in cases of necessity without diminishing the coverage of other stations. Certainly, technology exists that will afford the desired protection. Moreover, we viewed the policy of waiving Section 73.207, even if only to permit short-spacing of a mile, as undesirable because it undermines, at least to some extent, the effectiveness of the distance separation table. Neither Greater Media nor other commenters provided convincing arguments that a limited number of Section 73.207 waivers are necessary. The adopted Section 73.215 provides for site selection flexibility in those exceptional circumstances where no fully spaced sites are available. We do not believe additional short-spacing waivers of Section 73.207 would generally be in the public interest where an alternative means of achieving a similar result, such as Section 73.215, is available.[27] Therefore, we will deny the requests that we reinstate consideration of Section 73.207 waivers.

Issue 4: Whether stations employing directional antennas should be protected to maximum permissible, rather than actual, facilities [Section 73.215(b)(2)]

28. Currently, Section 73.215(b)(2)(iv) indicates that FM stations using directional antennas authorized pursuant to the new rules will be protected only to the contour defined by their current facilities. WHOK argues that because stations using directional antennas would likely be forever frozen at that signal pattern, it would be difficult, if not impossible, to guarantee reliable community service in the face of shifting population centers. This scenario, WHOK observes, is at odds with the notion that radio station allocations[28] should be flexible to respond to the growth and demographic shifts that occur over time in most communities and regions.

29. We chose to protect actual contours because their locations are well defined, whereas the placement of desirable future contours is unknown. In addition, use of maximum permissible facilities would overprotect a station because any potential service increase might not be attainable or desired. In any event, it is not apparent the stations would be "frozen" forever as a result of this decision. For the near future, we expect it to be a rare event when a station authorized pursuant to Section 73.215 must be protected by another station changing its site pursuant to the provisions of Section 73.215. Even where it occurs, we believe the probability is low that the second station would encroach on the first in a way that would preclude desirable and practical directional antenna modifications. We did consider the idea of overlaying the actual contour on a full-facility omnidirectional contour to show the limits imposed by short-spacing and the potential expansion in other directions. However, this presents problems of maintaining two

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[26] According to Greater Media, Washington, D.C. is an example of this situation where virtually every station is short-spaced to some extent. Greater Media claims that a move of any of these facilities (other than those already located at the desired site) to either of two newly proposed multi-user antenna sites in the Washington area would result in every case with slight, but not *de minimis,* newly created short-spacings or worsening of existing short-spacings. With current technology, Greater Media asserts that a multi-user antenna cannot be directionalized for individual frequencies. Thus, Greater Media states that the only option permitted under the Commission's new rules is for all such affected facilities to reduce power to the extent necessary to provide equivalent contour protection to all short-spaced stations if the desired co-location is to be realized.

[27] Nevertheless, at the time the new rules were adopted, we did not give sufficient weight to the fact that there may be a very small number of cases, such as the one cited by Greater Media above, where the public interest would be better served by waiver of the rules rather than application of the directional antenna requirements of Section 73.215. Therefore we will consider waiver of Section 73.215 to permit greater power in a short-spaced station's direction where it is demonstrated that such a facility is necessary to allow use of a multiplexed transmitting antenna and that its authorization would otherwise serve the public interest, for example, by allowing retention of existing service to an underserved area.

[28] While WHOK refers to "allocations," the context of the comment suggests that the intended meaning should be "assignments."

patterns and artificially melding them. Accordingly, we are denying the request for protection of maximum possible facilities.

Issue 5: Received interference in currently unserved areas

30. In the *Report*, we noted that virtually all commenters agreed that licensees should not be allowed to accept interference beyond that permitted by the rules. It was also concluded that the Commission, at this time, prefers to gain further experience with various methods of limiting interference, such as through the use of directional antennas. Thus, the rules were not revised to permit acceptance of additional interference. dLR, in its petition, suggests that opponents of the concept of allowing stations to receive interference are envisioning the selling and buying of interference rights. While dLR recognizes that concern, it notes that interference may be received in some instances without service loss. dLR reports that this could occur when a station increases its signal and new interference is received within a portion of what would have been the station's new service contour. dLR observes that if no service was provided to that particular area before the station's adjustment, then effectively, no new interference is caused. dLR thus argues that the public loses nothing and will likely gain improved service by a station's moving to a location which enables it to maximize population served. Browne agrees with dLR on this issue. Accordingly, dLR suggests that the Commission weigh and counterbalance the necessity of receiving interference against the extent of additional service to be rendered.

31. We do not believe we should permit acceptance of interference, even under the limited scenario presented by dLR. Essentially, dLR's petition reduces to a proposal to allow applicants to negotiate interference standards on a case-by-case basis. The selection of such interference standards is properly a function of the Commission. We further note that one station's acceptance of interference would preclude some future facility changes by the station which causes the interference. Accordingly, we are denying dLR's request that we consider allowing stations to accept interference in limited cases.

Issue 6: Whether "equivalent protection" rather than "contour protection" should be used in the authorization of directional FM stations

32. dLR and Mullaney suggest that some of the complexities associated with the contour protection method used in conjunction with FM directional antenna authorization could be avoided by using what each believes is a more straightforward approach. dLR proposes "equivalent protection" as used in the television service. Under equivalent protection, affected stations[29] are considered to operate with maximum facilities for their class, with circular coverage areas. To use it in the FM service, an effective service contour would need to be selected which is outside the normally protected station contour.[30] The area of interference within the effective service contour that would be caused by a minimally-spaced full-facility station is then determined. This area represents the degree of interference permitted by the distance separation rules. Permitted effective radiated power may then be determined at the proposed short-spaced site to produce the same interference area.

33. dLR suggests two ways for determining the facilities of the shortspaced station. First, use of maximum antenna height is assumed and the power is adjusted to provide the equivalent protection just described. Alternatively, the HAAT could be determined using the standard 8-radial procedure, which would permit a lesser power reduction for a station with less than maximum antenna height. This approach is said to avoid discontinuities between the fully-spaced allotment rules and the short-spaced assignment rules, at least in the co-channel and first adjacent channel cases. It is also relatively insensitive to the propagation curves and interference protection ratios used.

34. Mullaney prefers the alternative method of protection used under the provisions for grandfathered short-spaced FM stations in Section 73.213. That rule allows grandfathered short-spaced stations to move their facilities provided their 1 mV/m contours do not move closer to the stations to which they are short.

35. It is not evident that these methods are less complex, nor would they yield actual interference protection as effective as the adopted method. Mullaney's method could allow the antenna height of the encroaching station to be elevated in its change to a new site with the interfering contour conceivably overlapping the protected station's service contour. Similarly, the dLR approach fails to account for variations in terrain elevations in different directions from the protected and interfering stations' transmitter sites. Therefore, to avoid authorizing harmful interference, we will maintain the adopted method involving contour overlap protection ratios.

Issue 7: What should be done about inconsistencies in the Section 73.207 table of distance separation requirements and whether the second adjacent channel protection requirements in Section 73.215(a)(2) are excessive

36. Mullaney argues that the distance separation requirements of Section 73.207 do not provide uniform contour protection for FM stations. Minor inconsistencies have come from rounding the required distances and changing the propagation curves, but Mullaney points out that a major difference exists between the required distance table and the contour overlap protection criteria adopted for second adjacent channel situations. While the distance table requires the same separation between second adjacent channel stations as it does between third adjacent channel stations (based on the contour protection criteria used for the third adjacent channel, *i.e.*, an interference contour that is 40 dB higher than the protected contour), the protection ratios we adopted for contour overlap are based on an interference contour that is 20 dB higher than the protected contour, which is more

[29] "Affected stations" are stations to which another station (as applied to the instant proceeding, a directional FM station) wishes to short-space.

[30] dLR points out that a minimally usable monaural FM signal may be as little as 0.050 mV/m.

restrictive. Browne supports Mullaney in this matter. Mullaney suggests that we amend Section 73.207 to remove at least the minor inconsistencies.

37. Changing the Section 73.207 distance spacing requirements is far beyond the scope of this proceeding. However, we are concerned about the inconsistent treatment of second adjacent channel stations accorded by the commercial FM distance separation table in Section 73.207 and the site flexibility provisions in Section 73.215. In adopting the contour protection provisions our model was the interference protection criteria that have been employed successfully by non-commercial educational FM stations (Section 73.509). In most situations, the NCE-FM requirements are based on the same planning factors as the commercial FM requirements. However, the second adjacent channel protection ratio is a significant exception. The adopted rules establish an incongruity in the way commercial FM stations are treated. Both the Section 73.207 domestic distance separation table and the Section 73.215(e) minimum distance table, which limits the extent of short-spacing, are based on the 40 dB protection ratio while the adopted contour protection provisions of Section 215(a) require use of the more restrictive 20 dB protection ratio. We have no reason to believe that the commercial FM second adjacent channel protection is inadequate, or that it allows significantly more actual interference than NCE-FM protection. Therefore, even though our confidence that contour protection is a valid approach is founded in part on our non-commercial educational FM experience, we now believe that it is more important to make the commercial FM contour protection provisions internally consistent with the other commercial FM requirements. Accordingly, we will amend Section 73.215(a)(2) by replacing the overlap provision for an interference contour that is 20 dB higher than the protected contour of second adjacent channel stations with one that is 40 dB higher.

Issue 8: Whether there is a need for the directional antenna limit of 2 dB per 10 degrees radiation pattern rate of change and how it and the limit of 15 dB on the ratio of maximum to minimum radiation should be applied [Section 73.316(b)]

38. In the *Report,* we concluded that our existing policy of restricting the rate of change of the horizontal antenna radiation pattern to 2 dB per 10 degrees of azimuth should be applied to all future directional antenna systems. Additionally, due to a lack of support in the comments, we decided not to amend the current requirement restricting the maximum to minimum antenna pattern gain to a 15 dB ratio. In its reconsideration request, dLR states that, in some cases, the 2 dB per 10 degree standard would require an expensive panel antenna when an economical side-mounted antenna could provide adequate protection. dLR further claims that the rate-of-change standard does not have any present engineering justification. dLR notes that the standard was developed to govern applications for grandfathered short-spaced stations. In such cases, the station was limited in power and antenna height in the direction of the station to which it was short-spaced.[31] dLR indicates that protection in such cases was calculated only along the connecting radial to the pertinent station and the rate-of-change standard served to prevent interference along other radials toward the pertinent station's service area. dLR argues that because the rules adopted in this proceeding require protection of the entire service area of the station to which the application is shortspaced, the 2 dB per 10 degree standard is no longer necessary.[32]

39. Browne agrees with dLR, but suggests that applicants be required to show how the directional antenna pattern would be achieved, certified and maintained if greater rates of change are employed. Browne also proposes the same showing requirement for the use of an antenna with a ratio of maximum to minimum radiation greater than the 15 dB allowed by Section 73.316(b)(1). Mullaney suggests that the 15 dB maximum to minimum ratio and the 2 dB/10 degree limitations only apply to stations' predicted antenna radiation patterns (the "envelope" patterns from construction permit applications) and not to the "as built" patterns filed with license applications.

40. Upon reconsideration, we are persuaded that we should apply the 2 dB per 10 degrees rate of change limitation only where the directional antenna is used to provide protection to a short-spaced station. At this time we are not prepared to eliminate or otherwise change either this requirement or the 15 dB maximum to minimum radiation ratio limit. While we recognize that the contour overlap provisions of Section 73.215 adopted in this proceeding require protection of a station's entire service area, we do not have an adequate record to justify relaxing these antenna requirements. We expect to further consider these matters when we institute a separate proceeding on FM directional antennas. Finally, we are amending Section 73.316(b)(1) to clarify that we now consider the 15 dB maximum to minimum radiation limit to be a requirement imposed on the antenna design and, while the goal should be to construct an antenna that will match the predicted pattern, we recognize that the actual pattern of the constructed and installed antenna may depart from that limit.[33]

Issue 9: Whether provisions are needed to limit the effects of potentially re-radiating objects and the effects of platforms [Section 73.316(c)(6)&(7)]

41. Greater Media argues that the incursion of conduits, transmission lines, detuning skirts and a host of other metallic objects with their collective potential for re-radiation into the antenna aperture and its immediate vicinity creates precisely the same potential for pattern distortion as the incursion of an additional antenna. Therefore,

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[31] *Fourth Report and Order* in Docket No. 14185 (FCC 64-919), 29 FR 14110, 14116, October 14, 1964.

[32] dLR also requests clarification of Section 73.316(c)(2) as to the need for an expanded scale on antenna pattern plots, noting that the expanded scale is only needed if the ratio of maximum to minimum radiation exceeds 20 dB.

[33] We will retain the Section 73.316(c)(2) requirement to use an expanded scale when displaying a pattern with greater than 20 dB maximum to minimum radiation. While this rule does not apply to most antennas, it does provide for a more precise description of the antenna patterns in those few cases where a waiver of the 15 dB rule is justified or the actual "as built" pattern exceeds 20 dB.

Greater Media urges the Commission to revise Section 73.316(c)(7), which restricts other antennas' incursions into the aperture of a directional antenna, to restrict these other incursions too. ABES makes a similar recommendation.

42. dLR, however, takes the opposite view, arguing that the rule governing antenna placement and tower construction are arbitrary and unnecessary. dLR believes that with appropriate antenna modeling, it is possible to take placement of other antennas and other physical objects in the vicinity of the antenna into account. dLR claims that because an antenna is no different from any other physical object, its placement in the aperture of another antenna should not be objectionable. dLR believes that not allowing antennas to occupy the same levels on a tower may cause increased harm to the environment because antennas that could otherwise share the same tower would be required to be mounted on a new tower.

43. Browne agrees with dLR and concludes that such a blanket rule cannot be supported on an engineering basis and recommends instead requiring the applicant to submit engineering data demonstrating that the proposed mounting arrangement considers the effects of other potentially re-radiating or reflecting objects within (or near) the aperture of the antenna. AFCCE agrees that such outright prohibitions of mounting directional antennas on platforms or in the aperture of other antennas are unwarranted. Instead, AFCCE suggests that the permittee and antenna manufacturer should be required to show accurate and stable directional operation under all reasonable conditions.

44. In a similar vein, Genesis seeks relaxation of Section 73.316(c)(6), which severely limits installation of FM directional antennas on platforms. Genesis states that it recognizes the Commission's desire for rules that ensure to the greatest extent practicable that stations operating at short-spaced locations using FM directional antennas will not cause interference. However, Genesis believes that this paragraph is unnecessarily restrictive because not all directional antennas are used for short-spaced assignments. Genesis noted that FM directional antennas have been successfully used in the past to meet other technical restraints, *e.g.*, to achieve compliance with signal restrictions over designated Quiet Zones, or to provide improved service without the need for the proscription contained in Section 73.316(c)(6). Moreover, Genesis asserts that it is possible to design and model an FM directional antenna to take into full account the effect on the array of a platform which is larger than the cross-sectional area of the tower. Thus, Genesis concludes that the blanket proscription contained in Section 73.316(c)(6) is excessively restrictive.

45. The intent behind the provisions of Section 73.316(c)(6) and (7) was to ensure that the pattern of a directional antenna was not distorted by other nearby objects in the horizontal plane. For example, the "platform restriction" was developed out of concern that a directional antenna intended to be mounted on top of a tower in an unobstructed configuration could have its pattern distorted by another FM, TV or even a land mobile antenna that might be mounted nearby elsewhere on the platform.

46. We continue to believe that at this time we must proceed cautiously and assure that FM directional antennas operate in a controlled, unobstructed and static environment. Our review of the provisions in Section 73.216(c)(6) and (7) leads us to conclude that they strike an appropriate balance between the differing concerns of the parties in this proceeding and that their amendment at this time is not warranted. However, we recognize that these provisions could unnecessarily preclude some valid FM directional antenna designs. Therefore, while we will consider waiving these rules in appropriate cases, upon a showing that the particular antenna design takes into consideration all other nearby antennas and other potentially reradiating structures, the requests for amendment of Section 73.216(c)(6) and (7) will be denied.[34]

Issue 10: Whether the rules assure that directional antennas are installed properly [Section 73.316(c)(8)]

47. NAB questions whether the use of a licensed surveyor, as required by the new rules, is adequate to ensure that an FM directional antenna is installed properly. NAB agrees that a licensed surveyor can determine the orientation of an installed FM antenna, but questions whether a surveyor can determine the proper installation of the antenna. NAB notes that there are many critical items to be checked when determining whether an FM directional antenna installation is correct (*e.g.* the position of the radiating elements, the proximity of metallic objects, the spacing from the broadcast tower). NAB asserts that a surveyor may not always be the best qualified professional to make these judgments. NAB claims that designing and installing directional antennas is difficult and complex technical work, and there needs to be some minimal guarantees that the work is done properly. Thus, NAB suggests the Commission should consider a requirement that the directional antenna design, instructions for installation and field measurements be certified by a "registered professional engineer."[35] However, JAB questions whether the use of a registered professional engineer is necessary.

48. We agree with the petitioners that a refinement in Section 73.316(c)(8) is necessary. On reconsideration, we believe that certification of an FM directional antenna's installation "pursuant to the manufacturer's instructions" is outside the competence of a surveyor. Therefore, we are revising the rule to require that the *installation* be certified by an engineer whose qualifications shall be submitted at the time of application for license. However, inasmuch as most electronics engineers are not trained in surveying, we will continue to require that a licensed

[34] By "nearby" we mean those antennas and structures located within the aperture of the directional antenna and within any unobstructed distance specified by the directional antenna manufacturer.

[35] A registered (or "licensed") professional engineer is one who has qualified (principally by education, experience and examination) for a state license to practice engineering in the state in which he or she resides or practices. Although professional engineers in all of the various engineering disciplines (*e.g.* civil, electrical, nuclear, etc.) receive the same type of certificate or license, the qualifying examination and experience must relate specifically to a particular discipline. In all but one of the 50 states and the District of Columbia, the examinations are standardized by the National Council of Engineering Examiners. Professional engineers are expected to practice only in the engineering disciplines in which they are competent.

surveyor certify that the *azimuth* of the directional antenna is "in the proper orientation." We expect that at the time surveying services are either arranged for or provided, the surveyor will be provided with the information necessary to determine the relationship between the antenna's main lobe and its mechanical construction. We believe this dual certification process will be responsive to both NAB's and JAB's concerns.

Issue 11: Whether the Commission should adopt more rigorous rules relating to physical deterioration or maintenance of directional antennas

49. NAB asserts that the Commission should address protection to FM stations from interference stemming from antenna system deterioration. ABES also states that more rigorous antenna installation standards are needed, and that pre-installation and post-installation procedures intended to insure the proper operation of directional antennas should be adopted. ABES concludes that the directional antenna performance and certification requirements specified in Section 73.316 of the rules will not insure that the operation of a directional antenna complies with the theoretical design. ABES thus suggests that periodic checks, such as at renewal time, should be required to show that no change has taken place in the antenna or in the immediate environment in which it operates.

50. In the *Report,* we found no apparent need for such changes in the policies and rules governing directional antenna performance at this time. We stated that existing requirements would be sufficient, for the most part, but added a number of requirements in Section 73.316(c) to further ensure that the predicted directional performance will be realized and maintained. We will also continue to require proofs of performance to establish that directional antennas have acceptable measured patterns. NAB and ABES do not provide us with information necessary to improve upon the current requirements. However, this matter may be explored further in a future directional antenna rule making. Until then, we believe the current provisions will be sufficient.

Issue 12: Whether the Commission should permit short-spacing in Puerto Rico and the Virgin Islands

51. dLR also notes that the Commission's rules, for several years, have permitted greater facilities for FM stations in Puerto Rico and the Virgin Islands per Section 73.211(b)(3). As a result, many of these stations currently generate signal overlap of the protected service contours specified in the new Section 73.215. Because of the unique topography and the maximum permitted facilities in the islands, dLR request that the procedures applicable to this area be clearly defined.

52. The *Report* did not address this matter. We now conclude that stations in Puerto Rico and the Virgin Islands that may wish to short-space their antenna sites may do so by applying the protection method set forth in the grandfather provisions of Section 73.213. Thus, Section 73.215 is amended to allow these stations to short-space their locations provided the predicted distance to the 1 mV/m field strength contour is not extended toward the 1 mV/m field strength contour of any short-spaced station.

Issue 13: Other requested clarifications

53. Mullaney requests clarification as to how non-commercial stations operating on channels 218, 219, and 220, are to be protected from short-spaced commercial assignments on Channel 221 and above. We note that non-commercial licensees operate on these channels on a contour protection basis, and are required to afford maximum protection to adjacent channel commercial station licensees. Thus, in keeping with current assignment practice, we wish to make clear that adjacent channel commercial stations should base the protection afforded non-commercial stations on their actual facilities since this is the level of protection that they receive from other non-commercial stations.

54. dLR notes that many existing short-spacings occurred after November 1964, and therefore, are not covered under Section 73.213 of the Rules. dLR suggests that it is not clear to what extent and under what conditions those facilities may be short-spaced. Such short-spaced stations with existing overlap with another FM station may also seek modifications pursuant to Section 73.215. While the directional antenna provisions are primarily intended to maximize protection to the service of the non-encroaching station, we see no reason why existing short-spaced licensees seeking to relocate to another similarly short-spaced site should forfeit service already established in directions where some overlap exists. Therefore, we will permit such facility re-location provided the current overlap is not increased.

REGULATORY FLEXIBILITY ANALYSIS

55. In accordance with the Regulatory Flexibility Act of 1980 (Pub. L. 96-354), a regulatory flexibility analysis follows:

I. Need and purpose of this action:

The Commission reaffirms that to provide applicants in the FM Broadcast Service with greater flexibility in the selection of transmitter/antenna sites, it will allow routine short-spaced station assignments, provided appropriate technical measures are taken, *i.e.,* the use of a directional antenna system or reduction in transmitter output facilities. In some cases, this action will permit the installation of facilities that would not be possible because of the lack of available sites at fully spaced locations. This will also permit them to more precisely locate their signal coverage over areas of greater demographic interest.

II. Summary of Issues Raised by Public Comment in Response to the Final Regulatory Flexibility Analysis:

None of the petitions for reconsideration or comments filed in response thereto addressed the Final Regulatory Flexibility Analysis presented in the *Second Report and Order.*

III. Significant Alternatives Considered and Rejected:

The only significant alternative would be to return to the process of granting waivers of the FM station distance separation requirements. This alternative was not chosen because no protection would be afforded short-spaced stations and because of the administrative inconvenience in reaching a decision that such waivers were in the public interest.

56. The Secretary shall send a copy of this Report, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act (Pub. L. No. 96-354, 94 Stat. 1164, 5 U.S.C. Section 601 *et seq.*, (1981)).

PAPERWORK REDUCTION ACT STATEMENT

57. The decisions contained herein have been analyzed with respect to the Paperwork Reduction Act of 1980, and has been found to impose a new or modified information collection requirement on the public. Implementation of any new or modified requirement will be subject to approval by the Office of Management and Budget as prescribed by the Act.

ORDERING CLAUSES

58. Accordingly, IT IS ORDERED THAT the Petitions for Reconsideration ARE GRANTED to the extent indicated above and ARE DENIED in all other respects. IT IS FURTHER ORDERED THAT, pursuant to authority contained in Sections 4 and 303 of the Communications Act of 1934, as amended, 47 U.S.C. 154 and 303, and effective **November 1, 1991,** Part 73 of the Commission's Rules IS AMENDED as set forth below in the Appendix.

FEDERAL COMMUNICATIONS COMMISSION

Donna Searcy
Secretary

APPENDIX

47 CFR Part 73 is amended as follows:

1. The authority citation for Part 73 continues to read as follows:

Authority: 47 U.S.C. 154 and 303.

2.47 CFR Section 73.207 is amended by revising paragraph (a) to read as follows:

Section 73.207 Minimum distance separation between stations.

(a) Except for assignments made pursuant to Section 73.213 or Section 73.215, FM allotments and assignments must be separated from other allotments and assignments on the same channel (co-channel) and five pairs of adjacent channels by not less than the minimum distances specified in paragraphs (b) and (c) of this section. The Commission will not accept petitions to amend the Table of Allotments unless the reference points meet all of the minimum distance separation requirements of this section. The Commission will not accept applications for new stations, or applications to change the channel or location of existing assignments unless transmitter sites meet the minimum distance separation requirements of this section, or such applications conform to the requirements of Section 73.213 or Section 73.215. However, applications to modify the facilities of stations with short-spaced antenna locations authorized pursuant to prior waivers of the distance separation requirements may be accepted, provided that such applications propose to maintain or improve that particular spacing deficiency. Class D (secondary) assignments are subject only to the distance separation requirements contained in paragraph (b)(3) of this section. (See Section 73.512 for rules governing the channel and location of Class D (secondary) assignments.)

* * * * *

3. 47 CFR 73.215 is amended by revising paragraph (a)(2), adding paragraph (a)(4), and revising paragraph (e) to read as follows:

Section 73.215 Contour protection for short-spaced assignments.

(a) * * *

(2) The interfering contours, for the purpose of this section, are defined as follows. For co-channel stations, the F(50,10) field strength along the interfering contour is 20 dB lower than the F(50,50) field strength along the protected contour for which overlap is prohibited. For first adjacent channel stations (+200 kHz), the F(50,10) field strength along the interfering contour is 6 dB lower than the F(50,50) field strength along the protected contour for which overlap is prohibited. For both second and third adjacent channel stations (+400 kHz and +600 kHz), the F(50,10) field strength along the interfering contour is 40 dB higher than the F(50,50) field strength along the protected contour for which overlap is prohibited.

* * * * *

(4) Stations in Puerto Rico and the Virgin Islands may submit application for short-spaced locations provided the predicted distance to their 1 mV/m field strength contour is not extended toward the 1 mV/m field strength contour of any short-spaced station.

* * * * *

(e) The Commission will not accept applications that specify a short-spaced antenna location for which the following minimum distance separation requirements, in kilometers (miles), are not met:

Relation	Co-Channel	200 kHz	400/600 kHz
A to A	92 (57)	49 (30)	29 (18)
A to B1	119 (74)	72 (45)	46 (29)
A to B	143 (89)	96 (60)	67 (42)
A to C3	119 (74)	72 (45)	40 (25)
A to C2	143 (89)	89 (55)	53 (33)
A to C1	178 (111)	111 (69)	73 (45)
A to C	203 (126)	142 (88)	93 (58)
B1 to B1	143 (89)	96 (60)	48 (30)
B1 to B	178 (111)	114 (71)	69 (43)
B1 to C3	143 (89)	96 (60)	48 (30)
B1 to C2	175 (109)	114 (71)	55 (34)
B1 to C1	200 (124)	134 (83)	75 (47)
B1 to C	233 (145)	165 (103)	95 (59)
B to B	211 (131)	145 (90)	71 (44)
B to C3	178 (111)	114 (70)	69 (43)
B to C2	211 (131)	145 (90)	71 (44)

B to C1	241 (150)	169 (105)	77 (48)
B to C	270 (168)	195 (121)	105 (65)
C3 to C3	142 (88)	89 (55)	42 (26)
C3 to C2	166 (103)	106 (66)	55 (34)
C3 to C1	200 (124)	133 (83)	75 (47)
C3 to C	226 (140)	165 (103)	95 (59)
C2 to C2	177 (110)	117 (73)	56 (35)
C2 to C1	211 (131)	144 (90)	76 (47)
C2 to C	237 (147)	176 (109)	96 (60)
C1 to C1	224 (139)	158 (98)	79 (49)
C1 to C	249 (155)	188 (117)	105 (65)
C to C	270 (168)	209 (130)	105 (65)

* * * * *

4. 47 CFR 73.316 is amended by revising paragraphs (b), (b)(1), (b)(2) and (c)(8) to read as follows:

Section 73.316 FM antenna systems.

* * * * *

(b) Directional antennas. A directional antenna is an antenna that is designed or altered for the purpose of obtaining a non-circular radiation pattern.

(1) Applications for the use of directional antennas that propose a ratio of maximum to minimum radiation in the horizontal plane of more than 15 dB will not be accepted.

(2) Directional antennas used to protect short-spaced stations pursuant to Section 73.213 or Section 73.215 of the rules, that have a radiation pattern which varies more than 2 dB per 10 degrees of azimuth will not be authorized.

(c)* * *

(8) In the case of applications for license upon completion of antenna construction, a statement from an engineer (as well as a statement of the engineer's qualifications) that the antenna has been installed pursuant to the manufacturer's instructions and a statement from a licensed surveyor that the antenna is installed in the proper orientation.

* * * * *