AM Station, Technical Standards
Auditory Assistance Devices
Broadcasting, Re-Regulation
Deregulation
FM Station, Technical Standards
Television Station, Technical Standards

Report and Order adopted establishing general guideline principles to be used in future deregulation rule making proceedings and amending Parts 15, 73 and 74 of the Rules to eliminate unnecessary technical quality regulations. Guideline principles have been established for regulations relating to interference control, spectrum efficiency, interoperability and technical quality.
—*Technical Regulations*
GEN. Docket No. 83-114

FCC 84-521

BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C. 20554

In the Matter of:	
A Re-Examination of Technical Regulations	RM-1709 RM-2894 Gen. Docket No. 83-114

REPORT AND ORDER
(Proceeding Terminated)

Adopted: November 8, 1984; Released: December 7, 1984

BY THE COMMISSION: COMMISSIONER QUELLO CONCURRING AND ISSUING A STATEMENT.

Introduction

1. On February 17, 1983, the Commission adopted a *Notice of Inquiry and Proposed Rulemaking ("Notice")* in the above captioned matter requesting comments on the general concepts of technical regulation and proposing certain specific rule deletions in Parts 15 and 73.

2. This *Report and Order* (R&O) sets forth our analyses and conclusions on the general regulatory policies covered in the *Notice*, on the issue raised thereon in the comments and replies, and on the specific rule deletions proposed in the *Notice*. These general policies will help formulate additional deregulatory rulemaking proposals in related proceedings which will focus on particular categories of service and equipment.

3. We wish to emphasize that our principal objective in this and future proceedings of its kind is to eliminate unnecessary technical regulations and thereby create an environment that encourages innovation and avoids unnecessary and costly rulemaking. For several years the Commission has been examining all of its rules and policies and major deregulatory actions have resulted. It is our intention to extend our scrutiny to the area of technical regulation.

Procedural Matters

4. Four general points were expressed by the commenters dealing with nature and scope of this proceeding.[1] First, there were concerns that the *Notice* was either too broad in encompassing too many regulations, too narrow to achieve the Commission's goal, or ill-constructed to encourage commenters to respond to areas outside of their interests. Second, there were concerns that the regulations under consideration are intertwined, interdependent, and require complex assessment. Third, CBS and NAB, among others, believed there was the need for an advisory committee as a prerequisite for further action. Finally, several commenters argued for the retention of many technical regulations maintaining that Section 303 of the Communications Act mandates that the Commission regulate technical quality, interoperability and interference.

Discussion

5. In the *Notice* we divided the technical regulations into categories according to their primary purpose. The categories were interference control, spectrum efficiency, interoperability and signal quality. Understanding that a rule can serve more than one purpose, we employed a basic classification scheme that would facilitate the deregulatory efforts. On balance we believe this approach will work. Other approaches to classification were mentioned in the *Notice*. For instance, the rules could be divided functionally, rather than by purpose, into performance, design and conduct regulation.

6. Commenters generally seemed less interested in our methodology than what rules we proposed to eliminate. Many of the commenters complained that the *Notice* was too broad to allow adequate discussion of

[1] See comment and reply comment lists in Appendices A and B.

all major areas of technical regulation. Indeed, the Notice was very broad. Its purpose was to provide an overview of the Commission's technical standards as well as a reasonable scheme for their examination. It was a vehicle to stimulate thought and acquaint the public with our intentions. Many of the comments concerned only rather narrow issues of particular concern to one area of regulation.

7. Some commenters warned that some technical rules are so intertwined with others that too specific a proceeding will prove useless. In general we observed that within each rule part there can be an often complex relationship between rules. In fact some of the rules we are deleting today can be dispensed with largely because we are keeping others. This seems not to be the case, however, between the rule parts themselves. In a sense, the very organization of the rules suggests a part by part approach.

8. Some commenters claimed the need for an advisory committee as a prerequisite for further action.[2] We feel that we can address the technical needs of specific services on a case-by-case basis using the traditional notice and comment procedure that ensures industry participation. Industry groups need not wait for rulemakings, however. We urge industry to use existing associations and standards organizations to consider and suggest possible changes to regulations in advance of Commission action.

9. With respect to arguments about the Commission's mandate, we note that Section 303 of the Act authorizes regulation over the external effects and the purity and sharpness of emissions of stations "... from time to time, as public convenience, interest or necessity requires." Clearly there is no requirement that we continue regulation in areas where we find such regulation is no longer in the public interest. We have the authority, if not an obligation, to review all of our technical regulations in light of changes that have occurred in telecommunications markets since these rules were adopted and to determine whether such regulations still serve the public interest.[3]

Interference Control

10. In the *Notice* we stated that "interference control is a valid, even essential, government function" and that existing technical regulations may be the most direct means of achieving interference control. Concern in the comments focused on the necessity to exercise caution in revising the present rule structure and the feasibility of specific types of rule changes.[4] We agree and reaffirm the key nature of our interference

[2] See Comments of CBS and NAB.

[3] See e.g., *HBO, Inc. v. FCC*, 567 F.2nd 9,36 (D.C. Cir. 1977).

[4] See Comments of ABC, MIS, NAB, CBS, and Vincom.

prevention role and we intend to use all deliberate caution in reexamining our present rule structure. However, the present structure of narrowly defined emissions has also had a serious impact on technical innovation. We feel that our statutory mandate under Sections 1 and 303(g) of the Act requires us to consider new approaches to interference control. Any changes will be proposed in further rulemakings of a narrower scope than the Notice and will give all interested parties an opportunity to evaluate the effectiveness of the changes.

11. In the *Notice* we discussed the equivalent interference factor as an alternative to rigidly specified co-channel and adjacent channel separations and power limits. The concept of equivalent interference provides a mechanism by which a licensee would be able to use its transmitter, employing different forms of modulation, so long as no more interference would be caused than when operating with more conventional forms of transmission. To the extent this concept is employed, we will be able to eliminate the need for many rulemakings. Moreover, a licensee's or manufacturer's developmental plans would not have to be spread on a public record. Our staff is presently studying this approach in detail, and we expect to consider a more detailed proposal in further proceedings. We anticipate that it will be easier for the public to comment on a more detailed proposal limited to a single service category.

12. The *Notice* raised the possibility of relaxing frequency tolerance specifications where emission roll-off regulations were adequate to prevent adjacent channel interference. While one commenter supported this general concept, several others raised concerns of interference and a decrease in spectrum efficiency if more flexibility was allowed in this area. It was also pointed out that in services where AM and similar modulations with a strong carrier signal are used, frequency tolerance is essential to controlling interference from intercarrier beats. We recognize those concerns and will consider them in drafting any specific proposals in this area. We shall be especially careful in modifying stability rules in AM-like services susceptible to intercarrier beat.

Spectrum Efficiency

13. In the *Notice* we reasoned that ensuring technically efficient use of the spectrum justifies regulation in situations in which licensees lack incentives to voluntarily conserve spectrum and employ more spectrally efficient technologies. We also indicated that, where regulation of efficiency is warranted, it is less constraining to specify output or performance type standards, such as bits per second per hertz, rather than particular technologies, such as trunking or ACSB.

14. The comments generally confirmed the Commission's view that spectrum efficiency is a valid regulatory concern. Some also agreed that increasing licensee flexibility strengthens the incentive to use the

spectrum efficiently. Some commenters felt the Commission should take a more aggressive role in promoting and mandating spectrally efficient technologies, rather than relying on what those commenters perceived to be weak or non-existent marketplace incentives. Opinions were divided also on the most appropriate method of regulation. The general concept of regulating system output or performance rather than specifying a particular design or technology drew some support, although the complexities of defining and measuring spectrum efficiency were largely unaddressed.

15. Spectrum efficiency will be a valid reason for technical regulations as long as licensees incentives do not reflect the economic value of the spectrum and the corresponding incentive to be profligate in its use. Also the degree of regulatory control over efficiency will vary according to the particular service category. The same is true of the best method of regulation. We think, for example, that an output efficiency standard has little relevance in the context of the present television broadcasting service where technology is almost totally standardized to ensure interoperability goals. In other services, however, such a constraint may not apply. We are interested both generally and in this proceeding with all approaches to spectrum efficiency that rely on private incentives to use spectrum wisely.

Interoperability

16. In the *Notice* we defined interoperability regulations as technical rules that ensure that equipment owned by different entities are capable of operating together in the transfer of information. We pointed out that, where interoperability standards were desirable, they could be achieved by voluntary standards or mandatory regulations with different costs and benefits associated with each approach. However, in the case of interoperability mandated by law or treaty relating to emergency channels in the aeronautical and maritime mobile services, we clearly stated our intention of maintaining the *status quo*.[5]

17. Many parties argued the need for interoperability regulation in the broadcast services. Several parties raised issues of possible adverse

[5] Several commenters stated a need for interoperability standards in the Private Land Mobile Service (PLMRS). However, the Commission has traditionally allowed PLMRS licensees a choice of a small number of enumerated modulation types; for example, we presently allow AM, FM, and digital modulation for these users (see §90.207 of our Rules). Our experience has shown that licensees understand their own interoperability requirements and purchase the types of radio equipment necessary to maintain interoperability within their fleets. Those few licensees who require interfleet interoperability have also been able to select equipment to meet their requirements. Thus, we see no need at this time for initiating direct FCC regulation of modulation choices in order to mandate PLMRS interoperability.

impacts on national security/emergency preparedness (NSEP) if the present level of interoperability were to diminish greatly, but none stated specifically what level of interoperability they felt was essential. A possible NSEP impact would be a serious concern to us and will have to be considered on a case-by-case basis as specific proposals are made in future proceedings. We urge those agencies in the NSEP area to start considering interoperability requirements for specific services so that an overview is available to guide us in this area in future notices.

18. Parties commenting on potential adverse affects of deleting the present broadcast interoperability requirements ranged from those who said that such regulation was essential for the interoperability of broadcasters and home receivers to those who said such regulation facilitated receiver design and lowered cost. Others argued that discontinuing the detailed regulation of broadcasting emissions would have little immediate effect on today's standards due to the interlocking nature of the system but would facilitate the introduction of evolutionary changes. It was noted also that the impediment to innovation could be alleviated by a liberal special temporary authority and waiver policy.

19. We are aware of the concerns about the cacophony that preceded the formal regulation of radio in the U.S. in 1927. While detailed regulation of broadcast emissions may have been helpful in introducing the services we have today, it is fair to question the continuance of this regulation in all cases. Between 1963 and 1983 there were thirteen R&O's modifying §73.687, the broadcast transmitter standards for television. This is because the detailed nature of the present rules requires a rulemaking for any minor signal format change even if it is compatible with existing receivers. This rigidity thus tends to delay innovation which may be compatible with existing equipment and to increase the burden on the Commission and the public.

20. As was pointed out above, the interlocking nature of today's system of broadcast transmitters and receivers is likely to discourage radical changes that would obsolete receivers. Nevertheless, we recognize the concern of the commenters. In future proceedings which may explore the possibility of decreasing the detail of present interoperability standards, we shall proceed with caution, carefully considering both the power and the limitations of market forces and the use of voluntary standards to achieve the desired balance of interoperability and flexibility.

Technical Quality

21. In the *Notice* we stated that, in general, the existence or nonexistence of adequate competition and diversity in the supply of a service or equipment is the principal, if not the only, significant factor in deciding whether to regulate the technical quality of that service or equipment. The only clear exceptions discussed were certain services and

equipment used by the public primarily for safety of life and property, such as aeronautical and maritime mobile, which we suggested may warrant regulation even if competitively supplied. We also stated the view that most services and equipment under our jurisdiction are sufficiently competitive to warrant deregulation of technical quality.

22. The comments raised several factors other than an absence of competition and diversity as reasons to regulate technical quality. One factor mentioned in several comments is the inability of purchasers to evaluate the quality of technically sophisticated products or to ensure they are getting the quality they want. There was concern that communications products are uniquely difficult for consumers because the devices owned or used by individuals are often only a part of a larger system about which the consumer has little information and over which he has no direct control. (For example, a television viewer experiencing poor quality reception may have difficulty determining whether the cause is the receiver or some other part of the system.) Regulating the quality of the transmitter, it is argued, eliminates one possible source of degradation and simplifies the problem for consumers.

23. This concern over system complexity will have to be considered in specific cases. However, we note that there are a wide variety of technologically complex systems sold today without federal quality regulations except in the safety area and that this nonregulation is generally successful. In some cases though, telecommunications systems do have the unique characteristic of being split ownership systems (*e.g.*, the broadcaster does not own the receiver) and this complicates the feasibility of identifying the source of a quality problem by the end user. However, in services where there is effective competition, there are still ways for the consumer to identify quality and choose the quality consistent with their needs.

24. Existing quality rules serve a useful function as engineering benchmarks for system designers. The regulation status of these standards also imposes a real cost in that it is time consuming and expensive to go through a formal notice and comment procedure to update them. Moving such quality rules to a nonregulatory status (e.g. voluntary standards) would facilitate their updating and in many respects accomplish the same benchmark function as today. Indeed voluntary quality standards already exist in many areas we do not regulate.[6]

25. Several parties expressed concern over the viability of competition in small broadcast markets and the possible need for continued quality regulation in such markets. We have addressed similar concerns in previous proceedings dealing with program deregulation in radio and

[6] EIA studio transmitter link (STL) and land mobile radio standards.

television[7] and have found no need for a bifurcated approach. There is generally adequate competition between broadcasters and other suppliers of programming and entertainment.

26. Several commenters argued that, since broadcast licensees are trustees or stewards of the public airways, they should be required to maintain a minimum level of technical quality. While we agree that licensees have a responsibility to provide good quality service, we do not agree that such responsibility justifies direct regulation of technical quality. To the contrary, the pressure of competition and consumer choice have brought about a generally higher level of technical quality than required by our Rules.[8] The severe penalties imposed by the competitive marketplace on licensees who provide poor service make such behavior highly unlikely. Responsible conduct by broadcasters need not always be mandated by quantitative regulation.[9]

Guidelines

27. Based on the comments received and on our own long experience in the promulgation of technical regulations, we may reach some conclusions that should provide guidance in this and other proceedings. With respect to the broad categories of technical standards, our findings can be summarized in the following principles.

Interference - The control of harmful interference between users of telecommunications services and equipment is a valid regulatory function of the highest priority. Technical regulations deemed essential to interference control will be retained but will be carefully examined to ensure they are not unnecessarily restrictive in areas unrelated to interference control.

Spectrum Efficiency - Mechanisms to ensure spectrum efficiency are a high regulatory priority. However, explicit regulation of the spectrum efficiency of radio systems is not required where the following two conditions are both met: (1) licensees have an incentive to operate efficiently and (2) licensees are given the flexibility to choose the technical details of their system. Where significant flexibility is not possible and some regulatory control is necessary beyond merely setting the size of the channel assignment, the preferred type of regulation is one that specifies the required spectrum efficiency (*e.g.*, bits/second/Hertz) as opposed to a particular technology.

Interoperability - We attached a high priority to interoperability in many radio services, however, the priority of mandating specific interoperability through

[7] *Deregulation of Radio*, 84 FCC 2d 968 (1981); *TV Deregulation*, 49 Fed. Reg.

[8] The Commission's technical quality rules were adopted some 40 years ago and established the absolute minimum quality standards that broadcasters are required to observe. Since then, state-of-the-art transmission facilities and technological innovations have exceeded, by far, many of the above requirements.

[9] *See Deregulation of Radio, Docket 79-219*, 84 FCC 2d at 97, and *Aural Power* Docket 83-117, ___ F.C.C. 2d ___ (adopted April 19, 1984) at para. 15. In both proceedings, the Commission found that licensees had adequate incentives to provide satisfactory signals and programming to their audiences without quantitative standards.

regulation varies depending on the service. Direct Commission regulation of interoperability is useful in several cases such as 1) in systems where instant communications between all stations is critical to safety (e.g. the maritime and aeronautical distress frequencies), 2) in systems where interoperability can be shown to be critical to national security/emergency preparedness concerns (e.g. the Emergency Broadcast Service), and 3) in helping the introduction of new services involving large public participation (e.g. cellular radio telephone service). In non-safety cases where we consider mandatory standards we will consider them on a case by case basis, and we will consider whether the benefits of standards outweighs the costs and time delay involved. We will seek to deregulate standards when (1) it can be determined that they are sufficiently well established to be maintained as voluntary standards and (2) enough equipment is installed to give manufacturers and service providers the incentive to make any new changes compatible with the original equipment. In these non-safety cases, we will also consider alternatives to mandatory standards that endorse or give a preference to a specific standard rather than requiring it.[10]

Technical Quality - While the Commission has the discretionary authority, in many cases, to regulate the technical quality of telecommunications services and equipment, we find that it is not generally in the public interest to do so. Exceptions to this are limited to cases where there are explicit statutory or treaty mandates or some other overriding factor such as safety of life and property. The provisions of most telecommunications equipment and services can be considered sufficiently competitive to consider deregulation of technical quality.

28. It must be emphasized that the principles we have just enunciated are intended to be understood not as dogma but as useful tools to help us in the future. It is not our desire to set adrift established industries and communications services. We intend an incremental approach to technical deregulation. We do not expect this deregulation to occur in a void. It can be assumed that responsible industry organizations will continue to develop and promulgate what they perceive to be useful voluntary standards. We anticipate that the Commission will coordinate this process with the appropriate industries and the standards organizations.

Specific Rule Changes

29. The *Notice* stated reasons for undertaking this review of the technical rules and regulations with the hope of modifying burdensome rules to stimulate technological innovation in communications and to create, to the maximum extent possible, an unregulated, competitive marketplace environment for the development of communications. The technical quality regulations are prime examples of rules that were needed at one time to foster the growth of an industry by providing common specifications for everyone. Indeed, especially in the broadcasting field where the transmitting and receiving equipment is designed and owned by different groups, the quality regulations provided standards for

[10] See Multichannel TV Sound. See Second Report and Order, Docket 21323, (Adopted May 29, 1984), FCC 84-116.

the development of compatible transmitting and receiving equipment. Today, the broadcasting industry is mature. We are confident that the quality of broadcast stations will remain high. Never before have so many sources of entertainment been vying in the marketplace to please the consumer. Cable television, digital audio disks, VCR's, satellite programming, computer games, and other alternate sources of entertainment will provide the necessary incentive for broadcasters. Taking these factors into consideration, in the NPRM we proposed the deletion of various broadcast quality regulations as well as certain quality standards in Part 15 of the Rules. We turn now to a discussion of these regulations.

Section 73.40 - AM transmission system performance requirements

30. NAB argues that subparagraph 73.40(a)(2) must be retained because of the potential for interference to adjacent channels that would result from its deletion. ABES and Robert Jones, P.E., believe these are minimum standards and should be required of all licensees. NRBA does not favor the deregulation of Section 73.40 of the Commission's rules as proposed in the *Notice*. However, NRBA offers an alternative to the proposal, i.e., that a mere certification by the manufacturer that a broadcast transmitter meets the requirements of Section 73.40 would be sufficient to protect the broadcast licensees.[11] Cox indicated that this Section covers requirements for the general design of AM broadcast equipment as well as for providing the standard for checking equipment performance and, therefore, should be retained. Jules Cohen and Associates, P.C., object to the deletion of this Section, believing it to be necessary from the interference control and spectrum efficiency viewpoints. Motorola submits that eliminating the quality standards specified in Sections 73.40 and 73.128 of the Commission's rules would cast a pall of uncertainty over AM stereo as broadcasters and receiver manufacturers grapple with revised regulations. This could only degrade the quality of AM stereo. Thus, Motorola requests the above rules be retained. On the other hand, Harris agrees with the Commission that marketplace competition has brought about higher standards and agrees with the proposed deletions. CBS, like Harris, also favors relaxed quality standards believing that the proposed rules are generally surpassed by present transmission equipment and should be deleted.

31. An analysis of those regulations proposed for deletion in §73.40(a) is as follows: Subparagraph (1) describes the minimum level of modulation of which a transmitter must be capable. A broadcaster operating below

[11] This form of "certification" has already been provided. Broadcast transmitters are now authorized by a grant of notification instead of type acceptance. See Report and Order, Gen. Docket No. 83-10, adopted January 10, 1984, FCC 84-21, 49 FR 3991 published February 1, 1984.

this modulation level would experience a decrease in coverage area. Thus, there is an economic incentive for the broadcaster to continue to meet this specification, even without a quantitative requirement, and we feel that operation at a low modulation level is unlikely. Subparagraph (2) specifies the maximum permissible level of harmonic distortion, subparagraph (5) limits noise on the transmitted signal, and subparagraph (4) specifies the degree of carrier amplitude regulation for the transmitter. Some of the commenters argued that deletion of these rules would lead to interference to channels adjacent to the broadcaster whose signal did not comply. We believe that this will not happen because, first, we are retaining the provisions of §73.44(a) which directly limit emissions on adjacent channels and, second, any transmission which is of such poor quality that it causes interference on adjacent channels will also appear to be of poor quality to the intended listeners and will affect the broadcasters own audience by making his signals virtually unusable.

32. Subparagraph (3) concerns the frequency response characteristics of the broadcast transmitter. This is a quality standard and variance from it has no potential for increasing the level of interference to other stations. It is believed that the marketplace incentives are sufficient for the broadcaster to determine the "flatness" of the frequency response absent regulation. Regardless, audio processing by the broadcaster could be used to change the frequency response under the existing regulations. This rule, therefore, can be deleted.

33. Accordingly, after review of the comments we still believe that the marketplace forces are sufficient to ensure that broadcasters will continue to meet high quality standards without Commission regulation. Therefore, subparagraphs 73.40(a)(1) through (a)(5) will be deleted, as proposed. These deleted standards apply only to monophonic AM operation. Changes to the specifications relating to stereophonic AM operation were not proposed in the *Notice* but will be considered in a future proceeding.

Section 73.317 - FM transmission system requirements

34. Except for CBS and Harris, the majority of commenters opposed the Commission's proposal to eliminate subparagraphs (a)(1) through (a)(5) of this Section. They believed that: a) subparagraph 73.317(a)(1) should be retained because it directly affects interference to adjacent FM channels; b) subparagraph 73.317(a)(2) deals with pre-emphasis standards which are required to ensure interoperability among various pieces of equipment and, therefore, should be retained; and, c) subparagraphs 73.317(a)(3) through (a)(5) must be retained as guidelines in order to determine performance objectives. Harris and CBS believe that the above subparagraphs are generally surpassed by present transmission equipment and should be deleted. CBS regards as unclear the impact of

removing subparagraph 73.317(a)(2) but concludes that its deletion would be preferable to its retention.

35. Under Section 73.317(a), subparagraphs (1), (3), (4), and (5) deal with the transmitter characteristics of minimum level of modulation, harmonic distortion, frequency modulated noise, and amplitude modulated noise, respectively. For the same reasons as discussed for Section 73.40, the broadcaster has an economic incentive to maintain these specifications without the need for Commission regulation. However, subparagraph (a)(2) deals with the pre-emphasis applied to modulating signal with a corresponding de-emphasis contained in the receiver. This standard ensures interoperability between the receiver and the transmitter, and that portion related to pre-emphasis will be retained at this time. While the broadcaster can still use audio processing to change the characteristics of the received signal, the retention of this standard will ensure that the recovered signal will be the same as that processed audio supplied by the broadcaster. It is not necessary to retain the minimum frequency response requirement which is also contained within this regulation. Frequency response is clearly a quality standard that need not be mandated by the Commission. Accordingly, it is appropriate to delete subparagraphs (a)(1) and (a)(3) through (a)(5) and revise subparagraph (a)(2) of Section 73.317 and defer to the marketplace. We will consider possible further modification of the pre-emphasis standard of subparagraph (a)(2) in a future proceeding which will review the FM service technical standards in depth. However, we are modifying the pre-emphasis requirements as per the attached appendix because we find that it is in the best interest of the broadcaster to adhere to the pre-emphasis characteristics as closely as possible.

Section 73.687 - TV transmission system requirements

36. NAB argues that television transmission system performance regulations should be retained, and that subparagraphs 73.687(a)(1) and (a)(2) are essential to the design of television transmission systems with possible interference control implications. NAB argues that subparagraph 73.687(a)(3) governs out-of-band radiation from television stations, and its purpose is to control interference; subparagraph 73.687(a)(4) provides measurement procedure to demonstrate compliance with the provisions of subparagraph 73.687(a)(3); subparagraph 73.687(a)(5), while not specifically related to interference to other stations, must be maintained as a guideline; subparagraph 73.687(a)(6) indirectly controls interference to adjacent channels; subparagraphs 73.687(a)(7) through (a)(9) assure compatibility between stations and receivers; subparagraphs 73.687(b)(1) indirectly controls interference to upper adjacent televisions channels; and, subparagraph 73.687(b)(2) defines the audio pre-emphasis curve which is used as a design criterion by television transmitter and receiver

manufacturers. Lastly, subparagraphs 73.687(a)(3) through (a)(7) contain aural transmitter performance objectives and measurement procedures. Other commenters hold similar views and urge the Commission to retain these standards. The Association of Maximum Service Telecasters (ASMT) holds a different view regarding subparagraphs 73.687(a)(1), (2) and 73.687(b)(1), and (3) through (9). AMST states that although these standards may not serve the goals of interference prevention, spectrum efficiency or interoperability, they are good indicators for judging station performance. CBS supports the proposed deletion of Paragraphs 76.687(a) and (b) as being either too loose to be of any real significance or too well established to be needed any longer.

37. Under Section 73.687(a), subparagraphs (1) and (2) specify the shape of the demodulated video signal. While severe deviations from the existing regulations could adversely affect the television reception of the broadcaster involved, these subparagraphs are primarily concerned with signal quality. Any degradation of these signal specifications would affect the picture quality, providing the broadcaster with an economic incentive to maintain these standards without Commission regulation. Subparagraph (9) states that the video input signal and the transmitted video signal should have a linear relationship. Again, this is a matter of quality that need not be addressed by regulation.

38. Section 73.687(b) regulates the characteristics of the transmitted television aural signal. The subparagraphs are identical to those employed for the FM broadcast service under Section 73.317(a) with the same interference or quality concerns. Accordingly, we will again defer to the marketplace for subparagraphs (a)(1), (a)(2), (a)(9), (b)(1), part of (b)(2), and (b)(3) through (b)(5) of Section 73.687. On the other hand, our review of subparagraphs (a)(3) through (a)(8) and (b)(2) suggests that these rules, to one extent or another, are intended not only to improve quality but to prevent interference, and promote interoperability. However, we are modifying the pre-emphasis requirement to be parallel to the change we are making in the FM service which we described in paragraph 35. These subparagraphs will be reviewed again in a future proceeding dealing with television technical regulations and will be retained in the interim.

Miscellaneous Broadcasting Matters

39. NAB and AMST suggested that the technical description on many quality regulations proposed for deletion should at least be maintained in some manner as guidelines or voluntary standards of good engineering practices that can serve as a reference for system designers. It would be preferable if the needed standards were eventually incorporated into existing or new publication by the voluntary standards development organizations (*e.g.*, EIA, IEEE, NAB, etc.). However, it may not be possible to do this at an early date, and the Commission may have to fill

the void between the time when the technical standards are removed from the Regulations and the time that they appear in publications of the voluntary standards organizations. The Commission can make the standards available for the guidance of and use by the private sector. These standards would be issued in the form of Office of Science and Technology (OST) Bulletins and would contain the information removed from the rules. It is planned that publication of these Bulletins would continue only so long as the information was found to be needed and was not available from a private sector publication.

40. Consequent to our decision to delete the pertinent subparagraphs of Sections 73.40, 73.317 and 73.687 of the Commission's rules, as outlined above, we are also deleting as moot the licensee proof of performance requirements of Section 73.1590(b)(l)(1), (ii), (iii), (iv); (b)(3)(i), (ii), (iii), (iv); (c)(1) and (c)(6). We are revising subparagraph (b)(3) of Section 73.1570 of the Commission's rules to define the total modulation of the aural carrier for monophonic TV transmitters which was previously defined in §73.687. Additionally, we take this opportunity to dismiss as moot two pending petitions for rule making (RM-2894 and RM-1709, filed by the NAB and Christopher Philip Payne respectively), urging the Commission to revise its "audio fidelity rules." These rules are deleted herein.

Sections 15.361, 15.363, and 15.365 - Auditory Assistance Devices

41. In addition to the Part 73 matters discussed above, the *Notice* proposed to delete Sections 15.361, 15.363, and 15.365 which specify standards for frequency stability, selectivity and densensitization, and image frequency responses, respectively, for auditory assistance receivers. We have classified these regulations under the category of minimum quality standards. Their proposed deletion is consistent with the idea that control of the technical quality of certain competitively supplied equipment can be satisfactorily obtained through marketplace forces and need not be mandated by the Commission.

42. Comments concerning these proposals were filed by NAB, Phonic Ear, Inc., and Williams Sound Corp. Williams Sound Corp. supported our proposal and agreed with our belief that these technical parameters could be controlled through the marketplace forces. The other commenting parties opposed the deletion of these rules stating that these rules are related to interference rather than quality and that, in any case, the special needs of the hearing impaired justify this form of regulation.

43. We agreed that the specified regulations address the matter of the degree of interference experienced by the receiver. However, these rules are concerned with the quality of reception rather than a source of interference to other radio operations. Generally, standards for controlling interference from transmitters address the matter of radio frequency

emissions and the effects of those emissions on other users of the spectrum. In this case, these receiver rules address the ability of the receiver to reject an interfering signal and are directly related to the quality of the received signal. Thus, these regulations are correctly classified as minimum quality standards. It should be noted that we are not dealing here with home electronic equipment. Such devices may be regulated with respect to susceptibility to interference pursuant to Section 302 of the Communications Act.

44. It is believed that the special needs of the hearing impaired will be more effectively addressed by the deletion of these Part 15 regulations. This will provide the users with the advantage of having a range of cost/performance combinations which may meet their needs better than a single standard design. Under the proposal being implemented by this action, auditory assistance users will be able to purchase the degree of receiver protection required for their particular needs. The retention of mandatory standards would not allow these distinctions to be made and would place the Commission in the position of having to make a single cost/performance trade-off based upon worse case assumptions. Should the potential users of auditory assistance devices be located in an area that is relatively clear of interfering signals or need only one or two channels, a less expensive receiver with relaxed specifications might be more suitable for their needs. Should the users be located in an area with a high level of radio frequency congestion or should they wish to install a multichannel system, a more expensive receiver system with specifications similar to those contained in the concerned regulations may be desired. Therefore, we will defer to the marketplace and are deleting Sections 15.361, 15.363 and 15.365 of the regulations.[12]

Ordering Clauses

45. Accordingly, IT IS ORDERED, pursuant to the authority contained in §§4(i), 302 and 303 of the Communications Act of 1934, as amended, that Parts 15, 73 and 74 of the Commission's Rules ARE AMENDED, effective December 7, 1984, as shown in Appendix C. IT IS FURTHER ORDERED that this proceeding IS TERMINATED.

46. IT IS ORDERED that RM-1709 and RM-2894 ARE DISMISSED.

47. The Secretary shall cause a copy of this *Report and Order*, including the Final Regulatory Flexibility Analysis, to be sent to the Chief

[12] The Commission has neither the expertise nor the primary jurisdiction to promulgate health and safety standards for auditory assistance devices. We shall defer to the expertise of the Federal health and safety agencies in the establishment of such standards. If such standards are adopted we would expect equipment submitted for FCC approval to comply with all applicable Federal standards, e.g., performance standards adopted by the appropriate divisions of the U.S. Department of Health and Human Service or safety standards adopted by the Consumer Product Safety Commission.

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, 50 U.S.C., *et seq.*).

48. Further information on this matter may be obtained by contacting Michael J. Marcus, (202) 632-7040, or John A. Reed, Office of Science and Technology, (202) 653-6288, or John A. Karousos, Mass Media Bureau, (202) 632-9660.

FEDERAL COMMUNICATIONS COMMISSION

WILLIAM J. TRICARICO, *Secretary*

*Appendices A&B-may be seen in FCC Dockets Branch, 1919 M Street, N.W., Washington, D.C.

APPENDIX C

A. Title 47 of the Code of Federal Regulations, Part 15, is amended as follows:

1. Section 15.333 is amended by revising paragraph (b) to read as follows:

§15.333 Operation in the band 72-76 MHz.

* * * * *

(b) A receiver may be operated as part of an auditory assistance system provided it meets the technical specifications in §15.367 and is certified pursuant to §15.345.

2. Sections 15.361, 15.363 and 15.365 are deleted in their entirety.

B. Title 47 of the Code of Federal Regulations, Part 73, is amended as follows:

1. Section 73.40 is amended by revising paragraph (a) and subparagraphs (b)(2) and (3), and by deleting subparagraphs (a)(1), (2), (3), (4), and (5) to read as follows:

§73.40 AM transmission system performance requirements.

(a) Stations must annually show compliance with §73.44. These emission limitations must be met under any conditions of modulation expected to be encountered by the station.

(b) * * *

* * * * *

(2) For main channel modulation only, the total audio frequency distortion from terminals to antenna output shall not exceed 5% harmonics (voltage measurements of arithmetical sums or r.s.s.) when modulated from 0 to 84% and shall not exceed 7.5% harmonics (voltage measurements of arithmetical sum or r.s.s.) when modulating 85% to 95% (distortion shall be measured with modulating frequencies of 50, 100, 400, 1000, 5000 and 7500 Hz up to tenth harmonic or 16,000 Hz, or any intermediate frequency that readings on these frequencies indicate is desirable). Harmonics should be observed to 20,000 Hz. When stereophonic transmission is used, the distortion must be measured in the left and right channels separately using a suitable stereophonic demodulator.

(3) The audio frequency transmitting characteristics for main (L+R), left (L) only and right (R) only modulation shall not depart more than 2 dB from that at 1000 Hz between 100 and 7500 Hz.

* * * * *

2. Section 73.317 is amended by deleting subparagraphs (a)(1),(3),(4) and (5) and subdivisions (a)(3)(i) and (ii), and by revising subparagraph (a)(2) as subparagraph (a)(1) and redesignating subparagraphs (a)(6) through (14) as subparagraphs (a)(2) through (10) to read as follows:

§73.317 Transmission system requirements.

(a) * * *

(1) Pre-emphasis shall be employed as closely as practicable in accordance with the impedance- frequency characteristic of a series inductance- resistance network having a time constant of 75 microseconds. (See upper curve of Fig. 2 of §73.333.)

(2) Automatic means shall be provided in the transmitter to maintain the assigned center frequency within the allowable tolerance (±2000 Hz).

(3) [Reserved]

(4) Adequate provision shall be made for varying the transmitter output power to compensate for excessive variations in line voltage or for other factors affecting the output power.

(5) Adequate provision shall be provided in all component parts to avoid overheating at the rated maximum output power.

(6) Means should be provided for connection and continuous operation of a modulation monitor.

(7) If a limiting or compression amplifier is employed, precaution should be maintained in its connection in the circuit due to the use of pre- emphasis in the transmitting system.

(8) Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive shall be attenuated at least 25 dB below the level of the unmodulated carrier. Compliance with this specification will be deemed to show the occupied bandwidth to be 240 kHz or less.

(9) Any emission appearing on a frequency removed from the carrier by more than 240 kHz and up to and including 600 kHz shall be attenuated at least 35 dB below the level of the unmodulated carrier.

(10) Any emission appearing on a frequency removed from the carrier by more than 600 kHz shall be attenuated at least 43 + 10 Log_{10} (Power in watts) dB below the level of the unmodulated carrier, or 80 dB, whichever is the lesser attenuation.

(b) * * *

* * * * *

3. Section 73.687 is amended by deleting subparagraphs (a)(1),(2),(9),(b)(1),(3),(4) and (5), and subdivisions (b)(3)(i) and (ii); by redesignating subparagraphs (a)(3) through (a)(8) as subparagraphs (a)(1) through (a)(6); by revising and redesignating subparagraphs (b)(2) as subparagraphs (b)(1); and, by redesignating subparagraphs (b)(6) and (b)(7) as subparagraphs (b)(2) and (b)(3), respectively, to read as follows:

§73.687 Transmission system requirements.

(a) * * *

(1) The field strength or voltage of the lower sideband, as radiated or dissipated and measured as described in paragraph (a)(2) of this section, shall not be greater than −20 dB for a modulating frequency of 1.25 MHz or greater and in addition, for color, shall not be greater than −42 dB for a modulating frequency of 3.579545 MHz (the color subcarrier frequency). For both monochrome and color, the field strength or voltage of the upper sideband as radiated or dissipated and measured as described in paragraph (a)(2) of this section shall not be greater than −20 dB for a modulating frequency of 4.75 MHz or greater. For stations operating on Channels 15-69 and employing a transmitter delivering maximum peak visual

power output of 1 kW or less, the field strength or voltage of the upper and lower sidebands, as radiated or dissipated and measured as described in paragraph (a)(2) of this section, shall depart from the visual amplitude characteristic (Figure 5a for §73.699) by no more than the following amounts:

-2 dB at 0.5 MHz below visual carrier frequency;

-2 dB at 0.5 MHz above visual carrier frequency;

-2 dB at 1.25 MHz above visual carrier frequency;

-3 dB at 2.0 MHz above visual carrier frequency;

-6 dB at 3.0 MHz above visual carrier frequency;

-12 dB at 3.5 MHz above visual carrier frequency;

-8 dB at 3.58 MHz above visual carrier frequency (for color transmission only).

The field strength or voltage of the upper and lower sidebands, as radiated or dissipated and measured as described in paragraph (a)(2) of this section, shall not exceed a level of -20 dB for a modulating frequency of 4.75 MHz or greater. If interference to the reception of other stations is caused by out-of-channel lower sideband emission, the technical requirements applicable to stations operating on Channels 2-13 shall be met.

(2) The attenuation characteristics of a visual transmitter shall be measured by application of a modulating signal to the transmitter input terminals in place of the normal composite television video signal. The signal applied shall be a composite signal composed of a synchronizing signal to establish peak output voltage plus a variable frequency sine wave voltage occupying the interval between synchronizing pulses. (The "synchronizing signal" referred to in this section means either a standard synchronizing wave form or any pulse that will properly set the peak.) The axis of the sine wave in the composite signal observed in the output monitor shall be maintained at an amplitude 0.5 of the voltage at synchronizing peaks. The amplitude of the sine wave input shall be held at a constant value. This constant value should be such that at no modulating frequency does the maximum excursion of the sine wave, observed in the composite output signal monitor, exceed the value 0.75 of peak output voltage. The amplitude of the 200 kHz sideband shall be measured and designated zero dB as a basis for comparison. The modulation signal frequency shall then be varied over the desired range and the field strength or signal voltage of the corresponding sidebands measured. As an alternate method of measuring in those cases in which the automatic d-c insertion can be replaced by manual control, the above characteristic may be taken by the use of a video sweep generator and without the use of pedestal synchronizing pulses. The d-c level shall be set for midcharacteristic operation.

(3) A sine wave, introduced at those terminals of the transmitter which are normally fed the composite color picture signal, shall produce a radiated signal having an envelope delay, relative to the average envelope delay between 0.05 and 0.20 MHz, or zero microseconds up to a frequency of 3.0 MHz; and then linearly decreasing to 4.18 MHz so as to be equal to -0.17 μsecs at 3.58 MHz. The tolerance on the envelope delay shall be ±0.05 μsecs at 3.58 MHz. The tolerance shall increase linearly to ±0.1 μsec down to 2.1 MHz, and remain at ±0.1 μsec down to 0.2 MHz. (Tolerances for the interval of 0.0 to 0.2 MHz are not specified at the present time.) The tolerance shall also increase linearly to ±0.1 μsec at 4.18 MHz.

(4) The radio frequency signal, as radiated, shall have an envelope as would be produced by a modulating signal in conformity with §73.682 and Figure 6 or 7 of §73.699, as modified by vestigial sideband operation specified in Figure 5 of §73.699. For stations operating on Channels 15-69 the radio frequency signal, as radiated, shall have an envelope as would be produced by a modulating signal in conformity with §73.682 and Figure 6 or 7 of §73.699.

(5) The time interval between the leading edges of successive horizontal pulses shall vary less than one half of one percent of the average interval. However, for color transmissions, §73.682(a)(5) and (6) shall be controlling.

(6) The rate of change of the frequency of recurrence of the leading edges of the horizontal synchronizing signals shall be not greater than 0.15 percent per second, the frequency to be determined by an averaging process carried out over a period of not less than 20, nor more than 100 lines, such lines not to include any portion of the blanking interval. However, for color transmissions, §73.682(a)(5) and (6) shall be controlling.

(b) * * *

(1) Pre-emphasis shall be employed as closely as practicable in accordance with the impedance-frequency characteristic of a series inductance-resistance network having a time constant of 75 microseconds. (See upper curve of Figure 12 of §73.699.)

(2) If a limiting or compression amplifier is employed, precaution should be maintained in its connection in the circuit due to the use of pre-emphasis in the transmitting system.

(3) Aural modulation levels are specified in §73.1570.

* * * * *

4. Section 73.1570 is amended by revising subparagraph (b)(3) to read as follows:

§73.1570 Modulation levels: AM, FM, and TV aural.

* * * * *

(b) * * *

* * * * *

(3) TV station. In no case shall the total modulation of the aural carrier exceed 100% on peaks of frequent recurrence, unless some other peak modulation level is specified in an instrument of authorization. For monophonic transmissions, 100% modulation is defined as ± 25 kHz.

* * * * *

5. Section 73.1590 is amended by deleting subdivisions (b)(1)(i), (ii), (iii), (iv), and (b)(3) (i), (ii), (iii), (iv), and subparagraphs (c)(1) and (c)(6) and marking them [Reserved]; and, by revising subdivisions (b)(2)(ii) and (iii) to read as follows:

§73.1590 Equipment performance measurements.

* * * * *

(b) * * *

(1) * * *

(i) [Reserved].

(ii) [Reserved].

(iii) [Reserved].

(iv) [Reserved].

(v) * * *

(2) * * *

(i) * * *

(ii) Data and curves showing audio frequency harmonic content for 25%, 50%, 75% and (main channel only) 100% modulation for the audio frequencies 50, 100, 400, 1000, 5000, and when attainable 7,500 10,000, 12,000 and 15,000 Hz (either arithmetical or RSS (root sum square)) value up to the 10th harmonic or 30,000 Hz) for equal left and right (L=R), left (L)

only and right (R) only signals. A family of curves must be plotted (one for each percentage above) with percent distortion as ordinate and audio frequency as abscissa.

(iii) Data showing percentage of carrier amplitude regulation (carrier shift) for 25, 50, 85 and, if obtainable, 100% modulation with 400 Hz tone for main channel modulation with equal left and right (L = R) signals.

* * * * *

(3) * * *

(i) [Reserved]

(ii) [Reserved]

(iii) [Reserved]

(iv) [Reserved]

(v) * * *

(c) * * *

(1) [Reserved]

* * * * *

(6) [Reserved]

* * * * *

C. Title 47 of the Code of Federal Regulations, Part 74, is amended as follows:

Section 74.750 is amended by revising subparagraph (d)(1) to read as follows:

§74.750 Transmission system facilities

* * * * *

(d) * * *

(1) The equipment shall meet the requirements of paragraphs (a)(1) and (b)(3) of §73.687.

* * * * *

CONCURRING STATEMENT OF COMMISSIONER JAMES H. QUELLO

In re: Report and Order in General Docket 83-114 to review the Commission's technical rules and regulations

This document purports to remove needless regulation from certain technical operations in the broadcast industry. Indeed, time and technological advances have served to improve certain equipment to the point where licensees can meet many of our minimum standards with ease.

Many of the comments in this docket have raised serious questions about the advisability of walking away from certain well established standards simply because burdens, usually very small ones, are incurred. I share those concerns because I continue to have a pride in the general quality of our broadcasting services and I do not wish to see that quality diminished. I concede that individual licensees have incentives to maintain high quality service. They also have competing incentives to cut costs. Our minimum technical standards tend to order a balancing of these incentives to the benefit of the American public.

Fortunately, the Report and Order does not reflect the full sweep of technical deregulation in the Notice of Proposed Rulemaking. For example, Section 73.687(a)(3) through (a)(8) and (b)(2) are not being deleted because of valid interference and interoperability concerns.

I cannot subscribe to some of the guidelines enunciated in this document. The Commission's desire to delete rules relating to technical quality is, I believe, a mistake. I also believe the Commission has a legitimate interest in the interoperability of various systems. While I do subscribe to the guideline that says mechanisms to ensure spectrum efficiency are a high regulatory priority, I do not believe that adequate incentives exist to use spectrum efficiently absent regulation.

I bow to the wishes of my colleagues to remove regulations which have proven to be unnecessary and burdensome. There are specific instances in this document where we may have gone too far but I believe they are sufficiently limited so as to permit the Commission to reimpose regulation in a timely fashion should that be necessary.

Therefore, I concur.