135. The IEEE/SCC28, the committee that developed the new ANSI/IEEE guidelines, comments that the issue relating to the discontinuity of treatment within the FM band (the 100 MHz breakpoint) has already been addressed during the process of reaching a consensus. According to the IEEE/SCC28, it was made clear at that time that the discontinuity of treatment within the FM band was based upon biological considerations rather than those involved in spectrum allocation.[172]

136. Many commenters assert that there is no reliable equipment to measure induced and contact current above 30 MHz.[173] "Based on the preliminary induced current measurements conducted by CBS, the Broadcast Joint Commenters (BJC) believe the scientific understanding of these phenomena -- and of the techniques and devices that will be needed to measure them -- have not yet developed to the point that would allow their measurement with sufficient reliability."[174] The BJC's position on measurement was reinforced recently by a study performed for the Commission by Richard Tell Associates.[175] Based on an assessment of commercially available instrumentation for induced current measurement, Tell concluded that, "it is not clear that measurements of induced body current are sufficiently reliable to accurately assess compliance with standards specifying limits for body currents under all possible conditions." [emphasis in original].

137. NAB states that given the present state of measurement technology and research data (particularly with respect to contact currents) "it is difficult, at best," and costly to certify a broadcast facility for compliance with the new ANSI/IEEE induced and contact current limits based on measurements.[176] NAB states that it is aware of commercially-available instrumentation for direct measurement of induced currents (and direct contact currents at certain frequencies). However, NAB cautions that requiring all broadcasters to perform costly field measurement to demonstrate compliance with the body current limitations would surely have a severe, negative impact on broadcasters.

138. Hammett & Edison and the Broadcast Joint Commenters indicate that a reliable, repeatable, commercially available VHF induced body current meter does not yet exist. Hammett & Edison state that tests made using a prototype Narda Model 8850 induced current meter

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[172] IEEE/SCC28 Comments at 1-2.

[173] Hammett & Edison, NAB, Louis A. Williams, Hatfield & Dawson, AFCCE, Broadcast Joint Commenters and CDE.

[174] BJC Comments at 18.

[175] See, note 165, supra.

[176] NAB Comments at 28.

showed variability between persons standing on the meter, non-symmetrical currents between left-foot only and right foot only conditions, . . . meter zeroing problems, and sensitivity to relatively low power emissions above 100 MHz."[177] The AFCCE agrees that there are no commercially available instruments to reliably measure contact currents.[178]

139. Hatfield & Dawson and the AFCCE note that Richard Tell & Associates has specialized equipment for measuring contact current but that this equipment has limited utility in a multiple frequency environment such as an antenna farm.[179] NIOSH states that with a properly calibrated, frequency-tunable, field intensity meter, induced current measurements could be measured for stations operating up to 108 MHz.[180]

140. NAB points out that while research data are available for induced currents, it does not appear to exist for contact currents.[181] NAB contends that contact currents vary with the size and shape of the object contacted and if the contacted object is relatively small, the presence of a body in the near vicinity modifies the field. Therefore, based on the limited information available, NAB suggests that we assume, for purposes of the guidelines, that electric fields low enough to guarantee compliance with induced current criteria will, in general, also assure compliance with contact current criteria.

141. BJC also agrees that the contact current standard poses measurement problems that are even more difficult, and are complicated in the AM band by the potential to energize objects such as construction cranes or metallic rope located as much as half a mile from an AM tower.[182] BJC contends it would be extremely impractical to require broadcasters to measure all metal objects near AM towers. These measurements would also be only temporary, BJC argues, because the configuration of such non-broadcast structures change frequently. JC&A argues that because of the many variables such as grounding of the person, size, shape and orientation of the object being contacted, judgements will have to be made on a case-by-case basis relative to the need for contact currents.[183]

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[177] Hammett & Edison Comments at 14-15, BJC Comments at 20-21

[178] AFCCE Comments at 8

[179] Hatfield & Dawson Comments at 4, AFCCE Comments at 8.

[180] NIOSH Comments at 3

[181] NAB Comments at 31

[182] BJC Comments at 32-33

[183] JC&A Comments at 8-9

142. Narda notes that the only way to quantify contact currents is to measure them and suggests that we require that contact current measurements be made on metallic objects, such as fences, that the public may come in contact with or that may be contacted by station personnel. It submits that these measurements should be made once to obtain certification and need be repeated only when antenna patterns are changed or whenever new metallic objects are added in the vicinity of the antenna(s).[184]

143. CDE urges that measurements with validated instruments by competent professionals "supersede any calculated evaluation" of facilities, and measurements or prediction methods should take precedence over personal monitors until their effectiveness and accuracy have been verified.[185]

144. Hammett & Edison states that the ANSI/IEEE limits on induced and contact body currents are likely to be very burdensome to broadcasters if we do not declare some reasonable limits regarding demonstrating compliance with the new standard.[186] For example, it notes that ANSI/IEEE does not define the impedance of a "standard person" at VHF frequencies, which would allow consistent modeling of induced and contact currents. Hammett & Edison also suggests that the we standardize measurement procedures for body currents.[187] It states that these factors should be measured with one foot raised to simulate a walking person and should also be required to be made at uniform heights. Hammett & Edison also asserts that ankle straps should be used in conjunction with an "RF boot" to ensure consistent and conservative readings.

145. The EPA recommends that we "consider including limits for induced and contact RF currents for the frequency range of 300 kHz to 100 MHz to protect against shock and burn . . . ."[188] This recommendation was in addition to EPA's support for our selection of the NCRP guidelines for field strength and power density that are somewhat different than those of ANSI/IEEE (see earlier discussion). EPA states that it agrees that the ANSI/IEEE induced current limits are useful and should also be implemented.

146. Dr. Om P. Gandhi of the University of Utah advises that since currents in excess of the RF safety guidelines could result for both controlled and uncontrolled environments, it appears to be important to measure not only the electric and magnetic fields but also the induced

[184] Narda Reply Comments at 4-2.

[185] CDE Comments at 4

[186] Hammett & Edison Comments at 11

[187] Hammett & Edison Comments at 14

[188] EPA Comments at 2

currents up to the maximum frequency of 100 MHz recommended in the ANSI/IEEE C95.1-1992 Safety Standard.[189] Dr. Gandhi further submits that induced currents are also substantial up to at least 108 MHz, and he. therefore, suggests that it may be desirable to limit induced and contact RF currents for the entire FM band up to 108 MHz. NIOSH also suggests that the induced current measurements should be required for up to 108 MHz, even though these frequencies were not included in the ANSI/IEEE 1992 guidelines.[190]

147. Decision. Most comments, including those of federal health and safety agencies, generally support the use of ANSI/IEEE limits for induced and contact currents as a means of controlling potentially harmful exposure to RF fields. However, in view of the continuing questions and difficulties relating to evaluation of induced and contact currents, especially with regard to measurements, we are not adopting the exposure guidelines for induced and contact currents at this time. Until these questions are satisfactorily resolved, we see no practical way to require compliance with these limits. We see merit in the suggestion of NAB and others that it may be possible to determine compliance with the induced current limits using the magnitude of the electric field strength. However, at this time we do not believe there is sufficient documentation in the record to support the accuracy and reliability of this method. Although we are not adopting limits for induced and contact currents in this proceeding, we recognize the desirability for limits to be adopted in the future, particularly if more accurate measuring instruments become available. Accordingly, we will continue to monitor the issues raised in this proceeding with respect to induced and contact currents, and we may revisit this issue and issue a specific proposal for controlling such exposures

148. With respect to the availability and reliability of instrumentation for measuring induced and contact currents, we note that there presently are at least two commercially-available "stand-on" type devices for measuring induced current.[191] Unfortunately, as noted above, the results of the study performed for the Commission recently by Richard Tell Associates shows that measurements using such instrumentation may be unreliable. Tell recommends that, "more extensive evaluation" of body current meters and their applications is needed in order to decide how best to perform assessments of compliance with the guidelines.[192]

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[189] Om P. Ghandi Comments at 1. Dr. Gandhi has done much of the research on induced currents and serves on the IEEE/SCC28 committee that developed the ANSI/IEEE guidelines

[190] NIOSH Comments at 3

[191] At least one manufacturer has also recently made available a "clamp-on" type induced current meter that may show improved measurement results. However, we have not yet evaluated this type of device with regard to accuracy and reliability.

[192] See, note 165, supra. Tell study at page 1

149. With respect to compliance with limits for contact currents, the Tell study evaluated the only commercially available instrument for measuring these currents. The study concludes that under most exposure conditions this meter could be used to adequately assess compliance with the ANSI/IEEE limits. However, it also concludes that "under typical working conditions" application of the meter can be inconvenient or inappropriate. Because of the many possible types and configurations of metallic objects that may be near a transmitter it appears that demonstrating compliance would require a large number of measurements. Furthermore, as reported in the Tell study, the commercially-available equipment for measuring contact currents only measures currents for frequencies up to 30 MHz. The ANSI/IEEE contact current limits apply up to 100 MHz.

150. In general, we agree with the comments of many respondents that at the present time compliance with contact current limits would be difficult to ascertain, and, in many cases, impractical. It was suggested in the comments that if induced current compliance is demonstrated then compliance with contact current restrictions should be considered to be proven by association. However, we have no specific data that would support this conclusion, and, the lack of confidence in demonstrating compliance with induced current limits makes this assertion irrelevant.

151. It should be noted that a source of significant exposure in occupational situations is the climbing of AM broadcast towers by persons who must perform maintenance and other tasks while the station is still transmitting. In these instances the primary source of energy absorption by the climber is due to the induced RF current flowing through the body. This has been a significant issue for many AM stations. Data and information does exist for the specific case of induced currents flowing through the body of a person climbing an AM broadcast tower. In this case control of the climber's exposure can be based on reducing operating power of the station while the person is on the tower. Data on such exposures has been acquired through joint studies conducted by our staff and the EPA and through a contract study performed for the Commission.[193] These studies have provided models for identifying the power levels associated with specific levels of induced current in the body of a tower climber. The specific procedures for determining these values are discussed in the referenced studies.

B. Amateur Radio

152. Amateur stations present an unusual case with respect to compliance with RF exposure guidelines. First, over 700,000 amateur stations in the United States are authorized by

[193] See: (1) R.F.Cleveland, Jr., E.D. Mantiply and R.A. Tell: "A Model for Predicting Induced Body Current in Workers Climbing AM Towers." Presented at the Twelfth Annual Meeting, Bioelectromagnetics Society, San Antonio, Texas, 1990 (Abstracts, p. 77). (2) R.A. Tell; "Induced body Currents and Hot AM Tower Climbing: Assessing Human Exposure in Relation to the ANSI Radiofrequency Protection Guide." Prepared for Office of Engineering and Technology, Federal Communications Commission, 1991

our rules to transmit from any place where the Commission regulates the service, as well as on the high seas. The Commission does not pre-approve individual amateur station transmitting facilities and no additional application is made for permission to relocate an amateur station or to add additional stations at the same or other locations. Second, the granting of a license is solely conditional upon the applicant passing an examination demonstrating that the examinee possesses the operational and technical qualifications required to perform properly the duties of an amateur operator under our rules. Third, amateur stations vary greatly. Amateur stations are located in dwellings, in air, surface and space craft, and carried on the person. Many of these stations transmit from residential or other areas where individuals may be in close proximity to an RF radiator. In addition, amateur station transmissions are made intermittently and may involve as many as 1,300 different emission types -- each with a distinctive on-off duty cycle. Finally, most amateur stations engage only in two-way communications. Thus, even when in operation, the station is usually transmitting but half of the time. There are many variables, therefore, to be considered in determining whether an amateur station complies with guidelines for environmental RF radiation.

153. Measurements made during a Commission/EPA study of several typical amateur stations in 1990 indicated that there may be some situations where excessive exposures could occur.[194] Further, among amateur operators themselves there appears to be varying degrees of knowledge concerning the potential hazards of RF radiation. At least one prominent amateur radio publication has a comprehensive section dealing with potential RF hazards at amateur stations.[195]

154. Comments on continuing to exempt amateur stations from demonstrating compliance are divided. The ARRL opposes inclusion, and claims that most amateur operators adopt the philosophy of prudent avoidance, that is, they avoid unnecessary exposure to electromagnetic radiation as a common-sense response to potential -- but not yet proven -- health hazards. The ARRL also states that its publications, which include sections on RF safety, urge amateur operators to practice prudent avoidance wherever possible and are sufficient to keep the amateur community informed of the hazards of RF radiation. The ARRL and the ARRL Bio-Effects Committee support "prudent avoidance" and state that most amateur operators do not possess the requisite equipment, technical skills, and/or financial resources to conduct an environmental analysis if the categorical exclusion for Part 97 were eliminated.

155. The ARRL argues that amateur stations, because of their intermittent operation, low duty cycles, and relatively low power levels, rarely exceed the 1992 ANSI/IEEE standard.

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[194] "Measurements of Environmental Electromagnetic Fields at Amateur Radio Stations," Report No. FCC/OET ASD-9601 (February 1996). Copies can be ordered through the National Technical Information Service (NTIS) at (800) 553-6847. NTIS Order No. PB 96-145016.

[195] See *The ARRL Radio Amateur Handbook For Radio Amateurs*. Copyright ARRL, Newington, CT.

Further, the ARRL suggests that the risk of exceeding those levels would only be relevant for a licensee and his or her family. The ARRL maintains that in this experimental service it is better to rely on education and testing of licensees than on submission of a complex environmental assessment which would not be valid for long in most cases since much amateur station transmitting equipment, especially antennas, is constructed and designed by the licensee and often changes. Therefore, the ARRL argues that amateur service licensees should not be subjected to routine environmental processing.

156. The ARRL states that if the Commission applied these rules to the amateur radio service, it then must facilitate the installation of amateur station antennas in configurations that will permit compliance with the RF exposure guidelines by issuing a more comprehensive preemption statement with respect to amateur station antennas than now exists, and must completely preempt the judicial enforcement of restrictive covenants which result in amateurs installing station antennas indoors or at locations on a horizontal plane with human occupants of residences. Indeed, the ARRL continues, such an order is overdue anyway; but the combination of adoption of a strict RF exposure standard and continuation of a hands-off attitude with respect to antenna covenants is tantamount to a license revocation, as it would preclude the operation of any amateur station subject to both restrictions.

157. The ARRL Bio-Effects Committee claims that amateur operators normally would be exempted from environmental review requirements, since most engage in operations that would not cause the ANSI/IEEE guidelines to be exceeded. However, it notes, a 100 watt VHF "vehicular installation" may produce higher fields inside the vehicle than the ANSI/IEEE standard would allow. Furthermore, hand-held transceivers, facilities employing indoor antennas, and facilities engaging in specialized activities such as "moonbounce" communication, may produce significant localized fields near the antenna.

158. Further, the ARRL Bio-Effects Committee notes that a comprehensive environmental review would be too burdensome both for the amateur operators and the Commission staff. It therefore recommends that a tabular chart showing the calculated field intensities at various distances from antennas having directive patterns, driven by transmitters of various power output levels common in the amateur service be added to Part 97. The ARRL Bio-Effects Committee also recommends inserting questions about electromagnetic radiation safety in each amateur operator license examination and requiring certification on the license application that the applicant has read the Commission guidelines, understands them, and agrees to comply. Under this scheme, the ARRL Bio-Effects Committee argues, amateur operators would follow the policy of "prudent avoidance" that the ARRL publications now advocate.

159. Professor Wayne Overbeck, filing comments as an individual, believes that few amateur operators are aware of the electromagnetic radiation levels present near their own amateur stations and that rather than being excluded from our requirements, the amateur service should be subject to the standard for "uncontrolled environments" through language added to Part

97. Professor Overbeck points out that vast numbers of amateurs are neither members of the ARRL nor subscribers to any amateur service magazines and consequently these educational sources are not sufficient to ensure adherence to our guidelines. Because actual measurements would be financially prohibitive for most amateur operators, Professor Overbeck recommends that we promulgate a rule requiring amateur operators to adopt operating and antenna-placement practices calculated to meet the exposure limits and that they be required to certify on their application forms that they have read and will adhere to the guidelines for antenna placement. Finally, Professor Overbeck suggests that we promulgate an amateur service version of OST Bulletin No. 65 that would include charts and tables showing required separation distances between antennas and inhabited areas for various power levels. He also suggests that amateurs be tested on this topic as part of operator license examinations.

160. Decision. The Commission expects all its licensees to comply with the RF guidelines specified in our rules, or, if not, to file an Environmental Assessment for review under our NEPA procedures. After a thorough review of the comments and the results of an FCC/EPA measurement study,[196] we conclude that, although it appears to be relatively small, there is a potential for amateur stations to cause exposures to RF radiation in excess of these guidelines. Amateur stations can transmit with up to 1500 watts peak envelope power on frequencies in specified bands from 1,800 kHz to over 300 GHz. Certain of the emission types permitted have high duty cycles, for example frequency or phase shifted digital signals. Amateur stations are not subject generally to restrictions on antenna gain, antenna placement and other relevant exposure variables. Even though situations where exposures are excessive may be relatively uncommon and even though most amateur stations transmit for short periods of time at power levels considerably lower than the maximum allowed, the possibility of human exposure to RF radiation in excess of the guidelines cannot be disregarded. Therefore, a blanket exemption for all amateur stations does not appear to be justified, and we will apply our new guidelines to amateur stations. We will rely upon amateur licensees to demonstrate their knowledge of our guidelines through examinations. We will also rely on amateur licensees to evaluate their own stations if they transmit using more than 50 watts of output power. Applicants for new licenses and renewals also will be required to demonstrate that they have read and that they understand our applicable rules regarding RF exposure.

161. We find it to be the duty of the licensee of an amateur station to prevent the station from transmitting from any place where the operation of the station could cause human exposure to levels of RF radiation that are in excess of the limits we are adopting. We concur with the ARRL that amateur operators should follow a policy of prudent avoidance of excessive RF exposure. We will continue to rely upon amateur operators, in constructing and operating their stations, to take steps to ensure that their stations comply with the MPE limits for both occupational/controlled and general public/uncontrolled environments. In this regard, we

[196] See, note 194, supra.

recognize and agree with the ARRL's position that the occupational/controlled limits generally can be considered adequate for situations involving amateur stations considering the most commonly used power levels, intermittent operation and frequencies involved. We recognize that operation in the amateur radio service presents certain unique conditions. Nonetheless, we are concerned that amateur radio operations are likely to be located in residential neighborhoods and may expose persons to RF fields in excess of the MPE guidelines. We will consider amateur radio operators and members of their immediate household to be in a "controlled environment" and will apply the occupational/controlled MPE limits to those situations. Neighbors who are not members of an amateur operator's household, are considered to be members of the general public, however, since they cannot reasonably be expected to excercise control over their exposure. In those cases general population/uncontrolled exposure MPE limits will apply.

162. We believe that the burden for action to assure compliance with RF exposure limits should fall on the relatively few licensees who operate stations that can potentially cause individuals, knowingly or unknowingly, to be exposed to RF energy in excess of these guidelines. We want the licensees of such stations to provide adequately for RF safety. We do not believe, however, that a detailed EA or other routine environmental filing is practical or necessary. To make the complex determination of possible excessive exposure as simple as possible, we are specifying a threshold limit for transmitter power that will apply regardless of frequency used. Below 50 watts transmitter power, the licensee will not be required to take any action, unless requested by Commission staff pursuant to Section 1.1307(c) or 1.1307(d) of our rules. Above this power threshold, the licensee must perform a routine evaluation to predict if the RF radiation could be in excess of that allowed by the criteria listed in § 1.1310. If so, the licensee must take action to prevent such an occurrence. The action could be in the form of altering operating patterns, relocating the antenna, revising the station's technical parameters such as frequency, power or emission type or combinations of these and other remedies. To assist with routine evaluation of exposure levels in accordance with the guidelines, we encourage the amateur community to develop and disseminate information in the form of tables, charts and computer analytical tools that relate such variables as operating patterns, emission types, frequencies, power and distance from antennas. We also intend to provide straightforward methods for amateur operators to determine potential exposure levels. This information could be included in our updated version of OST Bulletin No. 65, or we may follow the suggestion to develop a separate bulletin tailored for the amateur service community. As a result of the adoption of a transition period, which was discussed earlier, the new guidelines will apply to amateur stations beginning January 1, 1997. This should provide sufficient time for the amateur community and the Commission staff to prepare the necessary information to help amateur operators comply with these requirements.

163. As suggested by the ARRL, the ARRL Bio-Effects Committee and Professor Overbeck, we are amending our rules to require the operator license examination question pools to include questions concerning RF safety at amateur stations. We are requiring an additional five questions on RF safety within each of three written examination elements. We also are

adopting ARRL's proposal that amateur operators should be required to certify, as part of their license application process, that they have read and understand our bulletins and the relevant FCC rules.[197] We will rely on our Wireless Telecommunications Bureau to develop suitable methods for obtaining this certification.

C. Federal Preemption

164. In the past, parties have requested that the Commission preempt state and local authority over RF exposure matters.[198] To date the Commission has declined to preempt on health and safety matters. However, the Commission has noted that should non-Federal RF radiation standards be adopted that adversely affect a licensee's ability to engage in Commission-authorized activities, the Commission would consider reconsidering whether Federal action is necessary.[199]

165. In the Notice, we did not discuss Federal preemption of state and local regulations regarding RF radiation exposure. However, many commenters request that we address this matter by establishing Federal preemption of state and local regulations concerning RF radiation exposure.[200] Two Petitions for Rule Making have been filed in this docket requesting a Further Notice of Proposed Rule Making to address the preemption of non-Federal government regulations concerning RF radiation hazards.[201] The Village of Wilmette, Illinois, and Ergotec Assocation, Inc, in late-filed reply comments, oppose federal preemption of local RF exposure regulations.

166. Decision. In the past the Commission has hesitated to intrude on the ability of states and localities to make regulations affecting health and safety. Many of the comments indicate that a patchwork of divergent local and State regulations could pose a burden on interstate communications. However, since these comments were filed, Congress has passed the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996). Section 704 of the Telecommunications Act amends the Communications Act by providing for federal preemption of state and local regulation of personal wireless service facilities on the basis of RF

[197] ARRL Comments at 7. ARRL Bio-Effects Committee Comments at 5.

[198] See, 5 FCC Rcd 486 (1990).

[199] See, GEN Dkt 79-144, Report and Order, 100 FCC 2d at 558

[200] See, for example, comments of MSTV/NBC, McCaw, PacTel, Hammet & Edison, Joint Broadcasters, Celpage, Ericsson, AMSC, the New Jersey Broadcasters Association, and ARRL.

[201] See Electromagnetic Energy Association (formerly EEPA), Petition for Further Notice of Proposed Rulemaking and Hammett & Edison Comments requesting that it serve as a Petition for Rule Making concerning the preemption of state and local RF regulations

environmental effects.[202] The Telecommunications Act also provides for resolution of conflicts related to the regulation of RF emissions by the courts or by petition to the Commission.[203] Accordingly, we are amending § 1.1307 of our rules to incorporate the provisions of Section 704 of the Telecommunications Act.

167. The Telecommunications Act does not preempt state or local regulations relating to RF emissions of broadcast facilities or other facilities that do not fall within the definition of "personal wireless services."[204] It would appear from the comments that a few such regulations have been imposed, generally as a result of health and safety concerns. At this point, it does not appear that the number of instances of state and local regulation of RF emissions in non-personal wireless services situations is large enough to justify considering whether or not they should be preempted. We have traditionally been reluctant to preempt state or local regulations enacted to promote bona fide health and safety objectives. We have no reason to believe that the instances cited in the comments were motivated by anything but bona fide concerns.

168. We believe that the regulations that we are adopting herein represent the best scientific thought and are sufficient to protect the public health. Once states and localities have had an opportunity to review and analyze the guidelines we are adopting, we expect they will agree that no further state or local regulation is warranted. Should our expectations prove to be misplaced and should FCC licensees encounter a pattern of state or local activities which constitute an obstacle to the scheme of federal control of radio facilities set forth in the Communications Act, they should present us with such evidence as well as their view of the legal basis which could justify FCC preemption of state and local ordinances. At this time, however, we deny the petitions from the EEA and from Hammett and Edison, as well as the comments from several parties, requesting a broad-based preemption policy to cover all transmitting sources.

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[202] Telecommunications Act of 1996, Section 704 Facilities Siting; Radio Frequency Emission Standards. Sec. 704 (a) (7) (B) (iv). This section states that: "No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."

[203] Telecommunications Act of 1996, Section 704 (a) (7) (B) (v). This section states that, "Any person adversely affected by any final action or failure to act by a State or local government or any instrumentality thereof that is inconsistent with this subparagraph may, within 30 days after such action or failure to act, commence an action in any court of competent jurisdiction. The court shall hear and decide such action on an expedited basis. Any person adversely affected by an act or failure to act by a State or local government or any instrumentality thereof that is inconsistent with clause (iv) may petition the Commission for relief."

[204] Section 704 (a) (C) (i) of the Act defines "personal wireless services" to mean "commercial mobile services, unlicensed wireless services and common carrier wireless exchange access services."

V. CONCLUSION

169. To protect public health with respect to RF radiation from FCC-regulated transmitters, and to fulfill our responsibilities under NEPA, we are updating our guidelines for evaluating the environmental impact of RF emissions. We believe that the guidelines we are adopting will be of benefit both to the public and to the telecommunications industry. They will provide assurance that recent scientific knowledge is taken into account regarding future decisions on approval of FCC-authorized facilities and equipment.

VI. ORDERING CLAUSES

170. Section 704(b) of the Telecommunications Act of 1996 requires that we prescribe and make effective these new rules by August 6, 1996. Accordingly, we find that good cause exists, pursuant to 5 U.S.C. Sec. 553(d)(3), to make these rules effective upon publication in the Federal Register rather than to follow the normal practice of making them effective 30 days after publication in the Federal Register.[205] Completion of this rulemaking has required an extensive amount of work to resolve extremely complex issues. In addition, coordination with the various affected federal agencies through to the Interdepartment Radio Advisory Committee has consumed more time than anticipated. The time required to review the comments, decide on the best possible guidelines and coordinate that decision with other federal agencies has made it impossible to delay the effective date for 30 days and still meet the Congressionally imposed deadline. Thus, we have no alternative but to make these rules effective immediately. We note that the Notice in this proceeding was first issued in 1993. In addition, we note that the Telecommunications Act of 1996, containing a deadline for implementation, was enacted in early February of this year. Therefore, most parties to this proceeding have had considerable notice of the likely actions we would be taking, and they should have had sufficient opportunity to prepare for the implementation of new guidelines pursuant to the implementation schedule set forth above.

171. Accordingly, pursuant to the authority contained in Sections 4(i), 7(a), 303(c), 303(f), 303(g), 303(r) and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 157(a), 303(c), 303(f), 303(g), 303(r) and 332(c)(7), IT IS ORDERED, that effective August 6, 1996, Parts 1, 2, 15, 24, and 97 of the Commission's Rules and Regulations, 47 CFR Parts 1, 2, 15, 24, and 97, ARE AMENDED as specified in Appendix C.

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[205] See note 4, supra. Unlike other sections of that Act, see, e.g., Secs. 251(d)(d)(1), which directs us to "complete" action, and Sec. 254(a)(2), which directs us to "promulgate" rules, Sec. 704 requires that the RF exposure guidelines be made effective within the prescribed 180 day time period

172. IT IS FURTHER ORDERED, that the respective petitions of the Electromagnetic Energy Association, Hammett and Edison, Inc., and Ken Hollady ARE DENIED.

VII. PROCEDURAL MATTERS

173. For further information concerning this rule making, contact the Commission's radiofrequency safety program at (202) 418-2464. Address: Office of Engineering and Technology, Federal Communications Commission, Washington, D.C. 20554. Internet e-mail address: rfsafety@fcc.gov.

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton
Acting Secretary

APPENDIX A

Final Regulatory Flexibility Analysis

As required by Section 603 of the Regulatory Flexibility Act, 5 U.S.C. § 603 (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the Notice.[206] The Commission sought written public comments on the proposals in the Notice, including on the IRFA. The Commission's Final Regulatory Flexibility Analysis (FRFA) in this Report and Order conforms to the RFA, as amended by the Contract With America Advancement Act of 1996 (CWAAA), Pub. L. No. 104-121, 110 Stat. 847 (1996).[207]

I. Need for and Purpose of this Action:

The National Environmental Policy Act (NEPA) of 1969 requires agencies of the Federal Government to evaluate the effects of their actions on the quality of the human environment. To meet its responsibilities under NEPA, the Commission has adopted revised RF exposure guidelines for purposes of evaluating potential environmental effects of RF radiation from FCC-regulated facilities. The new guidelines reflect more recent scientific studies of the biological effects of RF radiation. Use of these new guidelines will ensure that the public and workers receive adequate protection from exposure to potentially harmful RF field.

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

No comments were filed in direct response to the IRFA. In general comments on the Notice, however, some commenters raised issues that might affect small entities. In particular, some commenters argued that the cost of complying with the radio frequency (RF) limits could be overly burdensome, and this could negatively impact small businesses. They express concern that the cost of testing, with respect to devices operating in close proximity to the body, is extremely expensive and obtaining testing equipment could be difficult for small businesses. For example, the National Association of Business and Educational Radio, Inc. (NABER) encourages us to categorically exclude land mobile transmitters, expressing concern that if categorical exclusions for land mobile services are eliminated, manufacturers would have to institute unnecessary and costly testing.[208] They also request that we limit the amount

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[206] See Notice of Proposed Rule Making, ET Docket No. 93-62, 8 FCC Rcd 2849 (1993).

[207] Subtitle II of the CWAAA is "The Small Business Regulatory Enforcement Fairness Act of 1996" (SBREFA), codified at 5 U.S.C. § 601 et seq.

[208] NABER Comments at 5-6.

of paperwork that is necessary for demonstrating compliance with the limits. In particular, the Broadcast Joint Commenters suggest that additional paperwork should not be required to establish compliance with the new policies because it would be needlessly burdensome to the broadcasters and to the Mass Media Bureau.[209] As discussed in Section V of this FRFA, we have attempted to address these concerns.

III. Description and estimate of the Small Entities Subject to the Rules:

The rules in this Report and Order will apply to the following twelve industry categories and services. The RFA generally defines the term "small business" as having the same meaning as the term "small business concern" under the Small Business Act, 15 U.S.C. § 632. Based on that statutory provision, we will consider a small business concern one which (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA). The RFA SBREFA provisions also apply to nonprofit organizations and to governmental organizations. Since the Regulatory Flexibility Act amendments were not in effect until the record in this proceeding was closed, the Commission was unable to request information regarding the number of small business within each of these services or the number of small business that would be affected by this action. We have, however, made estimates based on our knowledge about applications that have been submitted in the past. To the extent that a government entity may be a licensee or an applicant, the impact on those entities is included in the estimates for small businesses below.

As discussed below, under the rules we are adopting many radio services are categorically excluded from having to determine compliance with the new RF radiation limits that are being adopted. This exclusion is based on a determination that there is little potential for these services causing exposures in excess of the limits. Within the services below, many transmitting facilities are also categorically excluded based on antenna location and power. These categorical exclusions significantly reduce the burden associated with these rules, and may reduce the impact of these rules on small businesses.

A. Radiofrequency Devices

The radiofrequency devices affected by this rulemaking are low power, unlicensed transmitters that will be used to provide, on millimeter wave frequencies, a variety of services, including vehicle collision avoidance and high data rate/short range wireless data communications. Unlicensed personal communications service (PCS) transmitters are also radiofrequency devices. Radiofrequency devices are subject to compliance with the new RF

[209] Broadcast Joint Commenters Reply Comments at 39-40

radiation requirements at the time of equipment authorization. Therefore, it will be the equipment manufacturers and importers who will be affected by this action.

We expect most of the firms that would be interested in producing millimeter wave and unlicensed PCS devices will be large businesses. We note that Ford Motor and Hewlett Packard have expressed interest in millimeter wave devices and filed comments in this proceeding. In addition, Motorola and Ericsson Corporate, both large equipment manufacturers, have expressed interest in manufacturing unlicensed PCS devices. Nevertheless, it is conceivable that small businesses will also want to manufacture these devices.

The Commission has not developed a definition of small entities applicable to radiofrequency devices. Therefore, the applicable definition of small entity is the definition under the SBA applicable to the "Communications Services, Not Elsewhere" category. A small millimeter wave device or unlicensed PCS entity under this definition is one with less than $11.0 million in annual receipts.[210]

The Commission has not yet authorized any millimeter wave devices, and has authorized fewer than ten unlicensed PCS devices. Both these services are new, so we really don't know how many applications for equipment authorization we may receive, nor how many small manufacturers may be interested in producing these products. Since the Regulatory Flexibility Act amendments were not in effect until the record in this proceeding was closed, the Commission was unable to request information regarding the number of small businesses in this category. The Census Bureau estimates indicate that of the 848 firms in the "Communications Services, Not Elsewhere" category 775 are small businesses. Based on this information, as well as our past experience in granting equipment authorization for other types of radiofrequency devices, we estimate that 50 percent of the applications for millimeter wave and unlicensed PCS devices will be from small businesses.

The Commission anticipates that approximately 30 applications will be filed annually for devices that operate in the millimeter band and unlicensed PCS spectrum. All of these applications will require an initial determination of compliance with our new RF guidelines. Of these devices, ten will require specific absorption rate (SAR) modeling or measurement, which adds cost to the authorization process.

B. Cellular Radio Telephone Service

The Commission has not developed a definition of small entities applicable to cellular licensees. Therefore, the applicable definition of small entity is the definition under the Small

[210] 13 CFR § 121.201, Standard Industrial Classification (SIC) Code 4899

Business Administration (SBA) rules applicable to radiotelephone companies. This definition provides that a small entity is a radiotelephone company employing fewer than 1,500 persons.[211] Since the Regulatory Flexibility Act amendments were not in effect until the record in this proceeding was closed, the Commission was unable to request information regarding the number of small cellular businesses and is unable at this time to make a precise estimate of the number of cellular firms which are small businesses.

The size data provided by the SBA does not enable us to make a meaningful estimate of the number of cellular providers which are small entities because it combines all radiotelephone companies with 500 or more employees.[212] We therefore used the 1992 Census of Transportation, Communications, and Utilities, conducted by the Bureau of the Census, which is the most recent information available. That census shows that only 12 radiotelephone firms out of a total of 1,178 such firms which operated during 1992 had 1,000 or more employees.[213] Therefore, even if all 12 of these large firms were cellular telephone companies, all of the remainder were small businesses under the SBA's definition. We assume that, for purposes of our evaluations and conclusions in the Final Regulatory Flexibility Analysis, all of the current cellular licensees are small entities, as that term is defined by the SBA. Although there are 1,758 cellular licenses, we do not know the number of cellular licensees, since a cellular licensee may own several licenses.

We assume that all of the current rural cellular licensees are small businesses. Comments filed by small business associations, the Organization for the Protection and Advancement of Small Telephone Companies (OPASTCO), state that 2/3 of its 440 members provide cellular service,[214] and comments filed by the Rural Cellular Association (RCA) state that its members serve 80 cellular service areas.[215] We recognize that these numbers represent only part of the current rural cellular licensees because there might be other rural companies not represented by either association.

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[211] 13 C.F.R. § 121.201, Standard Industrial Classification (SIC) Code 4812.

[212] U. S. Small Business Administration 1992 Economic Census Employment Report, Bureau of the Census, U.S. Department of Commerce, SIC Code 4812 (radiotelephone communications industry data adopted by the SBA Office of Advocacy).

[213] U.S. Bureau of the Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications, and Utilities, UC92-S-1, Subject Series, Establishment and Firm Size, Table 5 Employment Size of Firms 1992, SIC Code 4812 (issued May 1995).

[214] OPASTCO Comments at 1-2 (filed January 9, 1995).

[215] RCA Comments at 2 (filed January 9, 1995).

The rules we are adopting generally require cellular stations to make a determination, through calculation or measurement, as to whether a transmitter facility will comply with the RF radiation exposure limits. If the facility does not comply with the limits, then the applicant (for a new license, a modification, or a renewal of an existing license) must file an Environmental Assessment (EA) pursuant to the National Environment Policy Act. The vast majority of applicants will find their facilities in compliance with the limits, or take steps such as controlling access around the transmitting facility, and will only need to indicate on their application that they comply with the limits. Many cellular transmission facilities are categorically exempted from making a compliance determination based on power and/or antenna height. The Commission processes roughly 700 applications for cellular transmitters facilities, involving 7,000 site locations, per year. Approximately 2,800 transmitting facilities will exceed categorical exclusion criteria and will require a determination of compliance with our new guidelines, based on calculations or measurements.

Manufacturers of mobile and portable cellular transmitters will have to make measurements, or in some cases calculations, as a condition for equipment authorization. Many of these manufacturers are likely to be the same as those that will manufacture unlicensed PCS transmitters, as discussed in the radiofrequency device category above. Based on the information presented for radiofrequency devices, as well as our past experience in granting equipment authorization for other types of radiofrequency devices, we estimate that 50 percent of the applications for cellular telephones will be from small businesses. It is estimated that 200 mobile and portable cellular transmitters will require authorization per year.

C. Personal Communications Service

The broadband PCS spectrum is divided into six frequency blocks designated A through F. Pursuant to 47 C.F.R. § 24.720(b), the Commission has defined "small entity" for Blocks C and F licensees as firms that had average gross revenues of less than $40 million in the three previous calendar years. This regulation defining "small entity" in the context of broadband PCS auctions has been approved by the SBA.[216]

The Commission has auctioned broadband PCS licenses in Blocks A, B, and C. We do not have sufficient data to determine how many small businesses under the Commission's definition bid successfully for licenses in Blocks A and B. As of now, there are 90 non-defaulting winning bidders that qualify as small entities in the Block C auction. Based on this information, we conclude that the number of broadband PCS licensees affected by the rule

[216] *See* Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, PP Docket No. 93-253, Fifth Report and Order, 9 FCC Rcd 5532, 5581-84 (1994).

adopted in this *Report and Order* includes the 90 non-defaulting winning bidders that qualify as small entities in the Block C broadband PCS auction.

At present, no licenses have been awarded for Blocks D, E, and F for spectrum. Therefore, there are no small businesses currently providing these services. However, a total of 1,479 licenses will be awarded in the D, E, and F Block broadband PCS auctions, which are scheduled to begin on August 26, 1996. Eligibility for the 493 F Block licensees is limited to "entrepreneurs" with the average gross revenues of less than $125 million. However, we cannot estimate how many small businesses under the Commission's definition will win F Block licenses, or D and E Block licenses. Given the facts that nearly all radiotelephone companies have fewer than 1,000 employees and that no reliable estimate of the number of prospective D, E, and F Block licensees can be made, we assume, for purposes of our evaluations and conclusions in this FRFA, that all of the licenses will be awarded to small entities, as that term is defined by the SBA.

After all PCS licenses have been issued, the Commission expects to receive approximately 1,000 applications per year involving 10,000 sites. We anticipate that 3000 sites will not meet the categorical exclusion criteria and will involve a determination of compliance with the RF exposure guidelines.

As in the case of cellular telephones, mobile and portable PCS transmitters will have to undergo measurement or modeling to determine compliance with the RF radiation limits as a condition of equipment authorization. Again, we estimate that 50% of the manufacturers will be small businesses. Although we have authorized fewer than ten PCS transmitters, it is estimated that eventually 50 of such devices will be authorized each year.

D. Private Land Mobile Radio Services, Specialized Mobile Radio

Pursuant to 47 C.F.R. § 90.814(b)(1), the Commission has defined "small entity" for geographic area 800 MHz and 900 MHz SMR licenses as firms that had average gross revenues of less than $15 million in the three previous calendar years. This regulation defining "small entity" in the context of 800 MHz and 900 MHz SMR has been approved by the SBA.[217]

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[217] *See* Amendment of Parts 2 and 90 of the Commission's Rules to Provide for the Use of 200 Channels Outside the Designated Filing Areas in the 896-901 MHz and the 935-940 MHz Bands Allotted to the Specialized Mobile Radio Pool, PR Docket No. 89-553, *Second Order on Reconsideration and Seventh Report and Order*, 11 FCC Rcd 2639, 2693-702 (1995); Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band, PR Docket No. 93-144, *First Report and Order, Eighth Report and Order, and Second Further Notice of Proposed Rulemaking*, 11 FCC Rcd 1463 (1995).

The rule adopted in this *Report and Order* applies to SMR providers in the 800 MHz and 900 MHz bands that either hold geographic area licenses or have obtained extended implementation authorizations. We do not know how many firms provide 800 MHz or 900 MHz geographic area SMR service pursuant to extended implementation authorizations, nor how many of these providers have annual revenues of less than $15 million. Since the Regulatory Flexibility Act amendments were not in effect until the record in this proceeding was closed, the Commission was unable to request information regarding the number of small businesses in this category. We do know that one of these firms has over $15 million in revenues. We assume, for purposes of our evaluations and conclusions in this FRFA, that the remaining existing extended implementation authorizations may be held by small entities, as that term is defined by the SBA.

The Commission recently held auctions for geographic area licenses in the 900 MHz SMR band. There were 60 winning bidders who qualified as small entities under the Commission's definition in the 900 MHz auction. Based on this information, we conclude that the number of geographic area SMR licensees affected by the rule adopted in this *Report and Order* includes these 60 small entities.

No auctions have been held for 800 MHz geographic area SMR licenses. Therefore, no small entities currently hold these licenses. A total of 525 licenses will be awarded for the upper 200 channels in the 800 MHz geographic area SMR auction. However, the Commission has not yet determined how many licenses will be awarded for the lower 230 channels in the 800 MHz geographic area SMR auction. There is no basis to estimate, moreover, how many small entities within the SBA's definition will win these licenses. Given the facts that nearly all radiotelephone companies have fewer than 1,000 employees and that no reliable estimate of the number of prospective 800 MHz licensees can be made, we assume, for purposes of our evaluations and conclusions in this FRFA, that all of the licenses will be awarded to small entities, as that term is defined by the SBA. . . . . .

The Commission receives about 3,000 applications for covered SMR transmitters facilities per year. Approximately 1,000 transmitters will exceed categorical exclusion criteria and will require a determination of compliance. In addition, as in the case of cellular telephones and PCS, mobile and portable covered SMR transmitters will have to undergo measurement or modeling to determine compliance with MPE and/or SAR requirements. It is estimated that 200 of such devices will require authorization per year.

E. Satellite Communications Services

The Commission has not developed a definition of small entities applicable to satellite communications licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radiotelephone companies.

This definition provides that a small entity is a radiotelephone company employing fewer than 1,500 persons.

Satellite systems authorized by the Commission can be divided into the following categories: mobile satellite service (MSS) non-geostationary satellite orbit (NGSO) (low or medium orbit satellites); mobile satellite service geostationary; mobile satellite service ship stations; and fixed satellite service.

In the MSS NGSO category the commission has divided its spectrum allocation into small and large NGSO. In the small NGSO or small low Earth-orbit (LEO) satellite service there are three existing and three pending or further licensees, all of which may be considered small business entities in the context of this analysis. These licensees are authorized in the VHF/UHF bands.

In the large LEO MSS category of MSS NGSO there are three existing licensees and three pending or future licensees in the 1.6/2.5 GHz band. The three existing are probably not small business entities and the three pending are probably small business entities. In the category of geostationary MSS the Commission has licensed one consortium, in the 1.5/1.6 GHz band, that comprises many small business entities.

The fixed satellite service (FSS) has generally been authorized in the 4/6 and 11/12 GHz band. There are three FSS licensees, that serve domestic US markets, none of which are small business entities. There are also two licensees serving international markets with FSS authorizations and these entities may be considered small business entities.

It should be noted that in most of the satellite areas discussed above the Commission issues one license to an entity but generally issues blanket license authority for thousands or even hundreds of thousands of earth stations or hand held transceivers. In this analysis we have considered satellite companies that have less than 1500 employees to be small business entities. Therefore, we are concluding that small business entities are largely affected by this proceeding in the satellite area.

The Commission receives about 600 applications for satellite facilities per year. All applicants must make a determination of compliance with the limits, based on calculations or measurements.

F. Radio Broadcast Service

The SBA has defined small radio broadcast service entities based on their "annual receipts" specifically in 13 C.F.R § 104, and its calculations include an averaging process. We do not currently require submission of financial data from licensees that we could use to apply the SBA's definition of a small business. Thus, for purposes of estimating the number

of small entities to which the rules apply, we are limited to considering the revenue data that are publicly available, and the revenue data on which we rely may not correspond completely with the SBA definition of annual receipts.

Under SBA criteria for determining annual receipts, if a concern has acquired an affiliate or been acquired as an affiliate during the applicable averaging period for determining annual receipts, the annual receipts in determining size status include the receipts of both firms. 13 C.F.R. § 121.104(d)(1). The SBA defines affiliation in 13 C.F.R. § 121.103. While the Commission refers to an affiliate generally as a station affiliated with a network, the SBA's definition of affiliate is analogous to our attribution rules. Generally, under the SBA's definition, concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. 13 C.F.R. § 121.103(a)(1). The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. 13 C.F.R. § 121.103(a)(2). Instead of making an independent determination of whether radio and television stations were affiliated based on SBA's definitions, we relied on the data bases available to us to afford us that information.

We have performed a study based on the data contained in the BIA Publications, Inc. Master Access Television Analyzer Database, which lists a total of 1,141 full-power commercial television stations. Low Power Television (LPTV) Stations and translator stations are discussed in paragraph H below. It should be noted that the percentage figures derived from the data base may be underinclusive because the data base does not list revenue estimates for noncommercial educational stations, and these are therefore excluded from our calculations based on the data base. Non-commercial stations are subject to the requirements adopted in the Report and Order. The data indicate that, based on 1995 revenue estimates, 440 full-power commercial television stations had an estimated revenue of 10.5 million dollars or less. That represents 54 percent of commercial television stations with revenue estimates listed in the BIA program. The data base does not list estimated revenues for 331 stations. Using an extreme scenario, if those 331 stations for which no revenue is listed are counted as small stations, there would be a total of 771 stations with an estimated revenue of 10.5 million dollars or less, representing approximately 68 percent of the 1,141 commercial television stations listed in the BIA data base.

Alternatively, if we look at owners of commercial television stations as listed in the BIA data base, there are a total of 488 owners. The data base lists estimated revenues for 60 percent of these owners, or 295. Of these 295 owners, 156 or 53 percent had annual revenues of less than 10.5 million. Using an extreme scenario, if the 193 owners for which revenue is not listed are assumed to be small, the total of small entities would constitute 72 percent of owners.

In summary, based on the foregoing extreme analysis using census data, we estimate that our rules will apply to as many as 1,150 commercial and non-commercial television stations (78 percent of all stations) that could be classified as small entities. Using the extreme analysis based on the data in the BIA data base, we estimate that as many as approximately 771 commercial television stations (about 68 percent of all commercial televisions stations) could be classified as small entities. As we noted above, these estimates are based on a definition that we believe greatly overstates the number of television broadcasters that are small businesses. Further, it should be noted that under the SBA's definitions, revenues of affiliates that are not television stations should be aggregated with the television station revenues in determining whether a concern is small. The estimates overstate the number of small entities since the revenue figures on which they are based do not include or aggregate such revenues from non-television affiliated companies.

In addition, according to the SBA's regulations, a radio broadcasting station must have annual gross receipts of $5.0 million or less in order to qualify as a small business concern.[218] There are approximately 10,250 commercial radio broadcasting stations and 1,810 noncommercial radio broadcast stations of all sizes in the nation, with approximately 5,200 different commercial licensees. For the same reasons as above, the exact number of small radio broadcasting entities to which the elimination of the rule will apply is unknown. Based on 1996 revenue estimates, the BIA Publications, Inc. Master Access Analyzer Database indicates that 3,314 commercial radio stations had an estimated revenue of $5.0 million or less. That represents approximately 32 percent of commercial radio stations with revenue estimates listed in the BIA program. The data base does not list estimated revenue for 6,571 stations. Using the most extreme scenario, if those 6,571 stations for which no revenue estimates is listed are counted as small stations, there would be a total of 9,885 stations with an estimated revenue of $5.0 or less, representing approximately 96 percent of the 10,257 commercial radio stations listed in the BIA data base

Alternatively, if we look at owners of commercial radio stations as listed in the BIA data base, there are a total of 5,207 owners. The data base lists estimated revenues for 29 percent of these owners, or 1,532. Of these 1,532 owners, 1,344 or 88 percent had annual revenue of less than $5.0 million. Using the most extreme scenario, if the 3,675 owners for which revenue estimates are not listed are assumed to be small businesses, then the total of small entities would constitute 96 percent of commercial radio station owners. Further, many noncommercial radio broadcasters are considered to be small entities. Thus, a large number of licensees of radio broadcast facilities of several types (commercial AM, commercial FM, and noncommercial FM stations) could benefit from the rule amendment herein adopted.

[218] 13 C.F.R. § 121.201

The Commission receives about 1,800 applications for broadcast facilities per year. All applicants must make a determination of compliance with the limits, either by calculation or measurement.

G. Stations in the Maritime Services

This item would require licensees and applicants for ship satellite earth terminals to make a determination of compliance with the new RF radiation requirements. The Commission has not developed a definition of small entities applicable to ship satellite earth station licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radiotelephone companies. This definition provides that a small entity is a radiotelephone company employing fewer than 1,500 persons.

Ship MSS is similar to geostationary MSS, as discussed above, except that earth stations are aboard maritime vessels rather than traditional earth stations in the MSS. In the area of ship MSS the Commission has two pending licensees for operation of the satellite service, one of which can be considered small business.

The Commission receives about 272 applications for ship earth stations per year. All applicants must make a determination of compliance with the new RF radiation limits.

H. Experimental, auxiliary, and special broadcast and other program distribution services

This service involves a variety of transmitters, generally used to relay broadcast programming to the public (through translator and booster stations) or within the program distribution chain (from a remote news gathering unit back to the station). It also includes Instructional Television Fixed Service stations, which are used to relay programming to the home or office, similar to that provided by cable television systems. The Commission has not developed a definition of small entities applicable to broadcast auxiliary licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radiotelephone companies. This definition provides that a small entity is a radiotelephone company employing fewer than 1,500 persons.

There are currently 2,637 FM translators and boosters, 4,910 TV translators, and 1,903 Low Power TV stations which will be affected by the new requirements.[219] There are also 2,032 ITFS licensees. The FCC does not collect financial information on any broadcast facility and the Department of Commerce does not collect financial information on these

[219] FCC news release, *Broadcast Station Totals as of June 30, 1996*, released July 10, 1996.

auxiliary broadcast facilities. We believe, however, that most, if not all, of these auxiliary facilities, including Low Power TV stations, could be classified as small businesses by themselves. We also recognize that most translators and boosters are owned by a parent station which, in some cases, would be covered by the revenue definition of small business entity discussed above. These stations would likely have annual revenues that exceed the SBA maximum to be designated as a small business (either $5 million for a radio station or $10.5 million for a TV station). As we indicated earlier, 96% of radio stations and 78% of TV stations are designated as small.

The approximate number of annual applications processed by the Commission for this service is 1,032. All of these applications would be required to have a determination made regarding compliance with the new RF radiation limits

I. Multipoint Distribution Service (MDS)

This service involves a variety of transmitters, which are used to relay programming to the home or office, similar to that provided by cable television systems. The Commission has not developed a definition of small entities applicable to MDS licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radiotelephone companies. This definition provides that a small entity is a radiotelephone company employing fewer than 1,500 persons. There are 1,800 MDS stations currently licensed and 500 applications for additional channels.

The approximate number of annual applications processed by the Commission for MDS is 900. It is estimated that of the 900 processed, only 113 will not meet the categorical exclusion criteria and have to make a determination of compliance with the RF radiation limits.

J. Paging and Radiotelephone Service, and Private Land Mobile Radio Services, Paging Operations

Since the Commission has not yet approved a definition for paging services, we will utilize the SBA's definition applicable to radiotelephone companies, i.e., an entity employing less than 1,500 persons

The Commission anticipates that a total of 15,531 non-nationwide geographic area licenses will be granted or auctioned. The geographic area licenses will consist of 3,050 MTA licenses and 12,481 EA licenses. In addition to the 47 Rand McNally MTAs, the Commission is licensing Alaska as a separate MTA and adding three MTAs for the U.S. territories, for a total of 51 MTAs. No auctions of paging licenses has been held yet, and there is no basis to determine the number of licenses that will be awarded to small entities. Given the fact that nearly all radiotelephone companies have fewer than 1,000 employees, and