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Before the
Federal Communications Commission

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Reasons for Such an Inquiry

3. There has been no wide-ranging review of the entire regulatory scheme concerning the performance verification of AM directional antenna systems since many of the present rules were adopted as part of the Commission's former Standards of Good Engineering Practice in 1939. Regulatory changes adopted since that time have been incremental, yet substantial changes in technology have occurred. The physical environment in which many stations operate has changed considerably over the years. Compliance with the current regulatory scheme is expensive, especially considering the limited profitability of AM broadcasting today. Technological advances facilitate a better understanding of antenna performance and electromagnetic field behavior. Improvements in electronic technology permit more accurate measurement of important internal operating conditions of antenna systems, which was not practical when many of the present rules were adopted. The effectiveness of other improvements in the Commission's technical assignment criteria is enhanced if the most practical and effective means of regulating actual antenna system performance is used.

Changes in the Physical Environment

4. The physical environment in which many AM broadcast stations operate has changed considerably since 1939. AM directional arrays originally located in sparsely populated areas are now often surrounded by urban and suburban development.

5. The propagation paths along which surface (ground) wave signals travel have become less homogeneous over the years. Foliage and buildings not present when AM arrays were constructed often surround those sites now. Soil erosion, grading, and fill have changed the effective conductivity of the ground itself. The proliferation of public utility lines (electric, telephone, and CATV) is now known to disturb the relationship between electric and magnetic fields, particularly in urbanized areas.

6. The "unobstructed" field strength measurement locations recommended in §73.186(a)(1) of the Commission's Rules are difficult to find near many AM broadcast arrays today. Access to existing and potential field strength measurement locations has become more restricted, due to such changes as land development, heightened property liability concerns, and the public response to increased crime.

7. Advances in the understanding of electromagnetic fields reveal that the relationship between electric and magnetic fields is not consistent in many environments, especially so in urban areas. An assumption of a constant relationship between those fields is inherent in the AM field strength measurement technique



directional array electric field radiation may be erroneous.

adjusting and monitoring AM directional array operation. The development and proliferation of powerful, desktop personal computers makes these techniques widely available to the engineering community serving broadcasters as employees and consultants.

11. Electronic instrumentation technology has improved greatly since 1939. Radio frequency current sensing and metering has been improved by, for example, the development of toroidal samplers and electronic meters. The accuracy and stability of antenna monitoring equipment has made great strides since 1939. Microprocessor-based data acquisition and processing systems permit real-time data analysis and monitoring undreamed of 25 years ago, much less 50 years ago. Unfortunately, as long as the regulatory scheme retains the basic characteristics adopted in a bygone era, there is little incentive for broadcast equipment manufacturers to develop state-of-the-art AM array instrumentation systems.

Relationship to Other Proceedings

12. The Commission is currently considering other improvements in technical regulation which seek to prevent further increases in interstation interference and erosion of AM service. These actions may be ineffective unless the most practical and effective means of regulating actual antenna system performance is in place.

13. The realization of intended protection from skywave interference at night is dependent upon the degree to which the verification of AM nighttime array performance relates to actual array radiation. Petitioners find that the present performance verification system relates only to apparent ground wave propagation. It is the experience of the Petitioners that, in demonstrating AM array performance under the current scheme, nighttime array electrical operating parameters are often skewed significantly away from theoretically calculated values in order to achieve the required ground wave observations. Petitioners are greatly concerned that such well-intentioned array misadjustments may lead to detrimental levels of skywave interference.

Conclusion

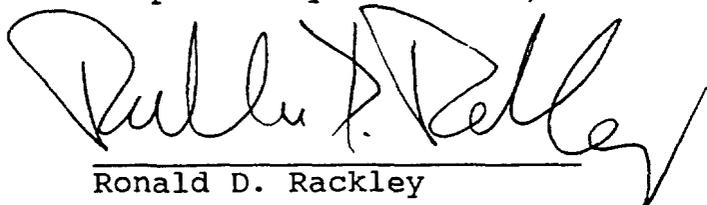
~~14. The Petitioners are concerned that the regulation of AM antennas~~

privately expressed interest in filing comments in response to such an Inquiry. Such comments will provide additional details, studies, and suggestions for the revisions of specific policies and rules. Petitioners believe that such an Inquiry will have a substantial role in improving the technical quality of AM broadcasting into the coming century.

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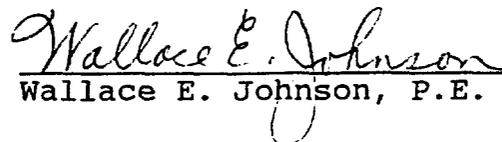
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Appendix

LIST OF FCC RULE SECTIONS POTENTIALLY AFFECTED

- 73.14 Definitions:
 - Antenna Current
 - Critical Directional Antenna
 - Nominal Power
 - Proof of Performance Measurements
- 73.33 Antenna systems; showing required
- 73.45 AM transmission system emission limitations
- 73.51 Determining operation power
- 73.53 Requirements for authorization of antenna monitors
- 73.54 Antenna resistance and reactance measurements
- 73.57 Remote reading antenna and common point ammeters
- 73.58 Indicating instruments
- 73.61 AM directional antenna field strength measurements
- 73.62 Directional antenna system tolerances
- 73.68 Sampling systems for antenna monitors
- 73.69 Antenna monitors
- 73.151 Field strength measurements to establish performance of directional antennas
- 73.152 Modification of directional antenna data
- 73.153 Field strength measurements in support of applications or evidence at hearings
- 73.154 AM directional partial proof of performance measurements
- 73.158 Directional antenna monitoring points
- 73.186 Establishment of effective field at one kilometer
- 73.189 Minimum antenna heights or field strength requirements