

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

In the Matter of 1998 Biennial Regulatory)
Review -- Amendment of Part 18 of the)
Commission's Rules to Update Regulations) ET Docket No. 98-42
for RF Lighting Devices)
)
)

FIRST REPORT AND ORDER

Adopted: June 9, 1999

Released: June 16, 1999

By the Commission: Commissioner Furchgott-Roth issuing a statement.

INTRODUCTION

1. By this action, we are amending Part 18 of the Commission's rules for radio frequency (RF) lighting devices. Recent developments and advances in RF lighting technology offer potential economic and environmental benefits for consumers and industry. The current Commission rules, however, do not easily accommodate these technological advancements and thus hinder the further development and implementation of these new products. This action seeks to eliminate unnecessary regulations and to support the introduction of new and beneficial products while ensuring that radio communications services are protected from interference. Accordingly, we are relaxing the line-conducted emission limits below 30 MHz for new consumer RF lighting devices.

BACKGROUND

2. RF lighting devices produce light by using RF energy to stimulate gases contained inside a lamp. In 1985, the Commission classified RF lighting devices as Part 18 Industrial, Scientific, and Medical (ISM) equipment and adopted rules to control the harmful interference to radio communications services from such devices.¹ The current Part 18 rules for RF lighting devices specify AC power line-conducted emissions limits between 450 kHz and 30 MHz and radiated emissions limits between 30 MHz and 1 GHz. Part 18 specifies different emissions limits for consumer and non-consumer RF lighting equipment. Consumer ISM equipment is equipment that is used or intended to be used by the general public in a residential environment.² Non-consumer ISM

¹ The Commission adopted RF lighting limits in 1985. These limits were based upon the Part 15 limits designed to control interference from digital and computing devices. See *Third Report and Order*, Gen. Docket 20718, FCC 85-445 (released Aug. 21, 1985), 50 Fed. Reg. 36061 (1985).

² See 47 C.F.R. § 18.107(g).

equipment is equipment that is used in commercial and industrial environments.

3. On April 1, 1998, the Commission adopted a *Notice of Proposed Rulemaking (Notice)* that proposed rules to accommodate a new generation of RF lighting devices.³ These new devices offer potential benefits for both consumer and non-consumer users.⁴ GE developed a new Electrodeless Fluorescent Lamp (EFL) for typical low power consumer applications such as in-home lighting. The GE lamp is designed to operate in the 2.2-2.8 MHz band.⁵ GE claims that its new lamp is more efficient and longer-lasting than incandescent consumer bulbs, and is an improvement over existing low frequency RF lights known as Compact Fluorescent Lamps (CFL). Unlike current RF lighting lamps, EFLs are nearly identical in size and shape to incandescent bulbs. GE reports that a new 23-watt EFL will provide light similar to a 75-watt standard incandescent bulb and is expected to last two or three times longer than present lamps that use electrodes.⁶ GE estimates that, if 10% of consumer lamps were replaced with EFL technology, energy consumption in the United States would be reduced by nearly 1 billion kilowatt hours, saving consumers approximately \$1.4 billion each year.⁷ The lamp cannot meet the current FCC line-conducted emission limits for consumer RF lighting devices without the addition of filters which would significantly increase costs and would impede market acceptance. In 1995 the Commission granted GE a waiver to begin marketing the lamp under relaxed line-conducted emissions limits in the 2.2-2.8 MHz band.⁸ In the *Notice*, the Commission proposed to codify the relaxed line-conducted emission limits.

4. We received eighteen comments and sixteen reply comments in response to the *Notice*.⁹ The comments, as well as our findings and conclusions, are discussed below.

³ See *In the Matter of 1998 Biennial Regulatory Review -- Amendment of Part 18 of the Commission's Rules to Update Regulations for RFLighting Devices*, ET Docket No. 98-42, *Notice of Proposed Rulemaking*, 13 FCC Rcd 11307 (1998). In the *Notice*, we designated this proceeding as part of our 1998 biennial review of regulations pursuant to section 11 of the Communications Act of 1934, as amended, (Communications Act). *Id.* at pg. 1. Section 11 requires us to review all of our regulations applicable to providers of telecommunications services and determine whether any rule is no longer in the public interest as the result of meaningful economic competition between providers of telecommunications service. See 47 U.S.C. § 161. As part of our biennial review, we stated that our goal in this proceeding was to reduce unnecessary regulatory burden and to support the introduction of new and beneficial products. *Id.* at para. 1.

⁴ In the *Notice*, we also proposed new rules for non-consumer lighting devices operating in the 2450 MHz band. On January 21, 1999, a letter representing both Part 15 interests and Fusion Lighting, a lighting manufacturer, was filed to ask that the Commission delay action regarding rules for non-consumer lighting devices. The parties asked for additional time to consider issues related to the operation of Part 15 devices in the 2450 MHz band. Accordingly, we are postponing adoption of final rules for non-consumer lighting and will address these issues in a future Report and Order.

⁵ RF lighting technology has typically been designed to operate at relatively low frequencies around 150 kHz.

⁶ See GE Waiver Request at Exhibit 2, article titled, "GE's Genura - a lighting industry first - makes global debut."

⁷ See GE Waiver Request at pgs. 11-12.

⁸ See GE waiver, granted October 23, 1995.

⁹ See Appendix B for a list of commenters.

DISCUSSION

5. In the *Notice*, the Commission proposed to relax the consumer line-conducted emission limits in Section 18.307(c) by 22 dB in the 2.2-2.8 MHz band, to the existing non-consumer limit of 3000 microvolts.¹⁰ This proposal was consistent with the waiver granted to GE. The 2.2-2.8 MHz band is allocated to several Government and Non-Government communications services, including aviation, international fixed public, maritime, private land mobile, Government fixed and mobile, and standard frequency and time transmissions.¹¹ Operations on these frequencies include, among others, Civil Air Patrol, ship to shore communications, broadcast auxiliary, local government and police operations. GE had performed analyses showing that there would be little risk of interference to these services if the line-conducted emissions limits were relaxed. GE marketed several hundred thousand EFLs under the waiver, with no reported incidents of interference to communications services.

6. GE supports the proposed rule relaxation, but asks that we modify the frequency range.¹² GE states that since the time it was granted a waiver international standards have been amended to accommodate this technology. Specifically, GE notes that IEC/CISPR relaxed the international line-conducted emissions limits for RF lighting devices over the frequency range 2.51-3.0 MHz.¹³ Therefore, GE requests that: (i) we relax the line-conducted limits over the frequency range 2.2-3.0 MHz; (ii) we relax the limits over the frequency range 2.51-3.0 MHz; or (iii) we adopt the relaxation as proposed over the frequency band 2.2-2.8 MHz. The National Electrical Manufacturers Association (NEMA) supports the proposed relaxation, but believes the frequency range should be shifted to 2.51-3.0 MHz to harmonize with international IEC/CISPR standard.¹⁴

7. ADTRAN, Inc. (ADTRAN) in its comments, states that it is concerned that higher conducted emissions could interact with other devices that are connected to the power lines to create harmonic signals that could cause interference in other parts of the spectrum.¹⁵ Donald L. Sweeney opposes relaxation of conducted limits in any frequency range because he is concerned that higher emissions could result in potential interference in other frequency bands due to higher harmonic emissions.¹⁶ GE's reply comments point out that any harmonic emissions must still comply with the conducted limits up to 30 MHz and the radiated limits above 30 MHz.¹⁷

¹⁰ See *Notice* at para. 7.

¹¹ See 47 C.F.R. § 2.106.

¹² See GE Comments pgs. 4-5.

¹³ The International Electrotechnical Commission, International Special Committee on Radio Interference (IEC/CISPR) adopted relaxed line conducted limits for RF lighting in the 2.51-3.0 MHz band in April 1997. See CISPR Publication 15, *Limits and Methods of Measurement of Radio Disturbance Characteristics of Electrical Lighting and Similar Equipment*, at Table 2a.

¹⁴ See NEMA Comments at p. 2.

¹⁵ See ADTRAN Comments at p. 2.

¹⁶ See Donald L. Sweeney Comments at p. 2.

¹⁷ See GE Reply Comments at p. 6.

8. We believe that it is appropriate to relax the line conducted limits to facilitate the use of this new technology. GE has demonstrated through experience gained under its waiver that the proposed relaxation of the line conducted limits does not pose any significant risk of causing interference to radio communications services. We find no evidence in the record to support ADTRAN's argument that the proposed relaxation of the line-conducted limit could increase spurious emissions due to interactions with other products. Further, we find no basis for the argument that the proposed relaxation could lead to increased harmonic emissions in other frequency bands because, as noted by GE, the Commission proposed no changes to the existing line-conducted and radiated emissions limits that apply to harmonic and spurious emissions outside the proposed frequency band.¹⁸

9. We agree with GE and NEMA that the frequency range for the rule relaxation should be changed to be consistent with international standards. We believe that harmonization with the frequency band used internationally will promote trade and reduce product costs.¹⁹ We note that no one objected to GE's request to change the frequency range. Accordingly, we are relaxing the consumer line-conducted emission limit in Section 18.307(c) by 22 dB to 3000 microvolts in the 2.51-3.0 MHz band, as proposed.

10. *Labelling.* The terms of the GE waiver required that an advisory label be placed on the product packaging warning of possible interference to maritime operations.²⁰ In the *Notice*, we asked for comment on whether to continue to require this advisory label and whether a similar label should be required for all RF lighting devices. Commenters, including the American Radio Relay League (ARRL) and the U.S. Coast Guard (Coast Guard), recommend requiring a label for RF lighting devices to warn users about potential interference to communication services.²¹ The Coast Guard recommends that we require a warning label for all RF lighting devices capable of producing conducted emissions in the 0.45-30 MHz band.²² NEMA recommends using a simple label with a short advisory statement.²³ GE does not oppose requiring an advisory label but asks for flexibility

¹⁸ See 47 C.F.R. § 18.307.

¹⁹ We note that the aeronautical mobile service operates in the 2.85-3.025 MHz in all regions of the world.

²⁰ In the waiver, we required the packaging containing the RF lighting devices be labelled with an advisory statement that contains the following information. "This product may cause interference to radio equipment operating in the frequency range of 2.2-2.8 MHz. Avoid placing this product near these devices. To reduce the possibility of radio interference to maritime safety communications, this device should not be installed: (1) on board cargo vessels of more than 300 gross tons, (2) on board vessels carrying more than twelve passengers for hire, and (3) at any medium frequency public coast station. Further, installation is not recommended on board vessels equipped with medium frequency single side-band marine radios. If interference occurs, move this product away from the device or plug either into a different outlet. Such interference should be reported to [an individual named by GE to receive complaints]."

²¹ See ARRL Comments at p. 3 and Coast Guard Comments at p. 1. The Coast Guard recommends using the following language: "Warning: This device may cause harmful interference to radio equipment operating in the frequency range 0.45-30 MHz. This device should not be installed in a shipboard environment."

²² See Coast Guard Comments at p. 1.

²³ See NEMA Comments at p. 2. NEMA recommends using the following language: "Not for use on ships or aircraft."

regarding the advisory language and location.²⁴ GE would prefer a simpler label than that required for its waiver and asks that manufacturers be allowed to choose the language and whether the information is placed on the product package or inside with other documentation. Fusion supports an advisory label.²⁵

11. We believe that an advisory label is appropriate to further ensure that RF lighting devices are not used in close proximity to critical navigation and communications equipment. Accordingly, we are requiring manufacturers of RF lighting devices to provide an advisory statement, either on the product packaging or with other user documentation, similar to the following: "This product may cause interference to radio communications and should not be installed near maritime safety communications equipment or other critical navigation or communication equipment operating between 0.45-30 MHz." Variations of this language are permitted provided all the points of the statement are addressed.

12. *Transient Emissions.* In the *Notice*, we invited comment as to whether any requirements may be necessary to address transient emissions that can occur when RF lighting devices are turned on and off.²⁶ GE and NEMA state that additional requirements are unnecessary.²⁷ GE states that transient emissions occur on the order of milliseconds and any should not cause objectionable interference due to the short duration and infrequent occurrence. We agree with GE and NEMA that requirements for transient emissions are unnecessary. The limited potential for added interference does not warrant additional regulations. Accordingly, we choose not to adopt any requirements for transient emissions.

PROCEDURAL MATTERS

13. *Final Regulatory Flexibility Analysis.* The Final Regulatory Flexibility Analysis, See 5 U.S.C. § 603, is contained in Appendix A

ORDERING CLAUSES

14. IT IS ORDERED that Part 18 of the Commission's Rules and Regulations IS AMENDED as specified in Appendix C effective 90 days after publication in the Federal Register in order to allow sufficient time for the Paperwork Reduction Act requirements due to the new labelling regulations. The proposed action is authorized under Sections 4(i), 301, 302, 303(e), 303(f), 303(r), 304 and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f), 303(r), 304 and 307.

15. IT IS FURTHER ORDERED that the Commission's Office of Public Affairs, Reference Operations Division, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Analysis in Appendix A, to the Chief Counsel for Advocacy of the Small

²⁴ See GE Comments at p. 6.

²⁵ See Fusion Reply Comments at pgs. 3-4.

²⁶ See *Notice* at para. 7.

²⁷ See GE Comments at p. 6 and NEMA Comments at p. 2.

Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas
Secretary

APPENDIX A

FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act (RFA),²⁸ the Commission prepared an Initial Regulatory Flexibility Analysis (IRFA) of the expected significant economic impact on small entities by the policies and rules proposed in the Notice of Proposed Rule Making ("Notice"). Written public comments were requested on the IRFA. The Final Regulatory Flexibility Analysis (FRFA) in this Report and Order conforms to the RFA.

Need for and Objective of the Rules:

This rule making proceeding was initiated to obtain comment regarding proposals to change the regulations for RF lighting. Recent developments and advances in RF lighting technology offer potential economic and environmental benefits for consumers and industry. The current Commission rules, however, do not easily accommodate these technological advancements and thus hinder the further development and implementation of these promising new products. This action seeks to relax the Part 18 regulations to accommodate new and beneficial products while ensuring that other important communications services continue to be protected from interference. This action will potentially benefit all entities using RF lighting technologies, including small entities.

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

No commenting parties raised issues specifically in response to the IRFA.

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

The RFA generally defines a "small entity" as having the same meaning as the terms "small business," "small organization," and "small government jurisdiction."²⁹ In addition, the term "small business" is the same meaning as the term "small business concern" under the Small Business Act ("SBA"), 15 U.S.C. § 632, unless the Commission has developed one or more definitions that are appropriate to its activities.³⁰ Under the SBA, a "small business concern" is one that (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) meets any individual criteria established by the Small Business Administration (SBA).³¹

The Commission has not developed a definition of small entities applicable to RF Lighting Devices. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to Communications Services, Not Elsewhere Classified. This definition provides that a small entity is one with \$11.0 million or less in annual receipts.³² According

²⁸ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. § 601 *et. seq.*, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

²⁹ See 5 U.S.C. § 601(6).

³⁰ 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 5 U.S.C. § 632).

³¹ 15 U.S.C. § 632.

³² 13 C.F.R. § 121.201, Standard Industrial Classification (SIC) Code 4899.

to Census Bureau data, there are 848 firms that fall under the category of Communications Services, Not Elsewhere Classified. Of those, approximately 775 reported annual receipts of \$11 million or less and qualify as small entities.

Description of Projected Reporting, Recordkeeping and Other Compliance Requirements:

Under Part 18 of the FCC rules, consumer ISM equipment must be approved under the FCC certification process and non-consumer equipment is subject to verification. No changes are being made to the testing and approval process requirements for RF lighting product.

Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered:

The new rules adopted in this *Report and Order* are intended to support the further development and implementation of new RF lighting products. These actions will benefit all RF lighting manufacturers, including small entities.

U.S. manufacturers have developed new RF lighting technologies that offer potential economic and environmental benefits to consumers and industry. General Electric (GE) has developed and Electrodeless Fluorescent Lamp (EFL) that operates between 2.2-2.8 MHz. This is a more efficient, longer lasting consumer lamp that is an alternative to normal incandescent light bulbs. EFL lamps represent a new generation of technology beyond the existing low frequency RF lights known as Compact Fluorescent Lamps (CFL), which are limited in their applications due to their non-traditional design using curved tubing. EFL lamps are nearly identical in size and shape to incandescent bulbs and therefore, are expected to have greater consumer applications and acceptance over CFL lamps.

The existing RF lighting rules were adopted many years ago for products operating at relatively low frequencies and do not easily accommodate new state-of-the-art RF lighting technologies. We are modifying our rules to accommodate these new technologies to the extent possible while still ensuring that communications services are protected from harmful interference.

Report to Congress.

The Commission shall send a copy of this Final Regulatory Flexibility Analysis, along with this Report and Order, in a report to Congress pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996, 5 U.S.C. § 801(a)(1)(A). A copy of this FRFA will also be published in the Federal Register, see 5 U.S.C. § 604(b), and will be sent to the Chief Counsel for Advocacy of the Small Business Administration.

APPENDIX B

Comments by:

1. 3Com Corporation (3Com)
2. ADTRAN, Inc. (ADTRAN)
3. Aironet Wireless Communications, Inc. (Aironet)
4. American Mobile Radio Corporation (AMRC)
5. American Radio Relay League, Inc. (ARRL)
6. Fusion Lighting (Fusion)
7. General Electric Company (GE)
8. IEEE 802 LAN/MAN Standards Committee (IEEE)
9. International Microwave Power Institute (IMPI)
10. Metricom, Inc. (Metricom)
11. National Association of Broadcasters (NAB)
12. National Electrical Manufacturers Association (NEMA)
13. Part 15 Coalition (Coalition)
14. Satellite CD Radio, Inc. (CD Radio)
15. Sweeney, Donald L. (Sweeney)
16. Symbol Technologies, Inc. (Symbol)
17. United States Coast Guard (Coast Guard)
18. Wireless LAN Alliance (WLANA)

Reply Comments by:

1. Airtouch Communication, Inc. (Air/LQ/Global) joint replies with L/Q Licensee, Inc. and Globalstar, L.P.
2. American Mobile Radio Corporation (AMRC)
3. Constellation Communications, Inc. (Constellation)
4. Fusion Lighting (Fusion)
5. Fusion UV Systems (Fusion UV)
6. General Electric Company (GE)
7. Johnston, Steven B.
8. Metricom, Inc. (Metricom)
9. Mobile Communications Holdings, Inc. (MCHI)
10. National Association of Broadcasters (NAB)
11. National Electrical Manufacturers Association (NEMA)
12. National Telecommunications and Information Agency (NTIA)
13. Part 15 Coalition
14. Satellite CD Radio, Inc. (CDRadio)
15. SpectraLink Corporation (SpectraLink)
16. U.S. GPS Industry Council (USGPS)

APPENDIX C
RULE CHANGES

Title 47 of the Code of Federal Regulations, Part 18, is amended to read as follows:

1. The authority citation for Part 18 continues to read as follows:

AUTHORITY: Sec. 4, 301, 302, 303, 304 and 307 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154, 301, 302, 303, 304 and 307, unless otherwise noted.

2. Section 18.213, paragraph (d) is added to read as follows:

* * * * *

(d) Manufacturers of RF lighting devices must provide an advisory statement, either on the product packaging or with other user documentation, similar to the following: This product may cause interference to radio equipment and should not be installed near maritime safety communications equipment or other critical navigation or communication equipment operating between 0.45-30 MHz. Variations of this language are permitted provided all the points of the statement are addressed and may be presented in any legible font or text style.

3. Section 18.307, paragraph (c), is amended to read as follows:

Section 18.307 **Conduction Limits.**

* * * * *

(c) RF lighting devices:

Frequency (MHz)	Maximum RF line voltage measured with a 50 uH/50 ohm LISN (uV)
Non-consumer equipment:	
0.45 to 1.6	1,000
1.6 to 30	3,000
Consumer equipment:	
0.45 to 2.51	250
2.51 to 3.0	3,000
3.0 to 30	250

Statement of Commissioner Harold W. Furchtgott-Roth

Re: 1998 Biennial Regulatory Review -- Amendment of Part 18 of the Commission's Rules to Update Regulations for RF Lighting Devices

I support today's decision to relax the Commission's rules where they hinder advancements in RF lighting technology.

This proceeding was initiated as part of the Commission's 1998 Biennial Review, which was conducted pursuant to Section 11(a) of the Act, *Id.* at Sect. 161(a). However, as thoroughly described in my *Report on Implementation of Section 11 by the Federal Communications Commission* (Dec. 21, 1998), which can be found on the FCC WWW site at <http://www.fcc.gov/commissioners/furchtgott-roth/reports/sect11.html>, I believe that the 1998 Section 11(a) review was not as thorough as it should have been. I look forward to working with the chairman and other commissioners on the 2000 Biennial Review, planning for which should begin in mid-1999.

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