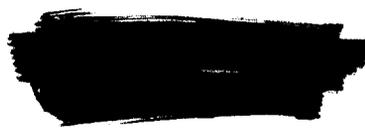


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FEDERAL COMMUNICATIONS COMMISSION

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WASHINGTON, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Petition of)
)
General Electric Company)
)
For Waiver of 47 CFR § 18.307(c))

File No.

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

PETITION FOR WAIVER

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SUMMARY

General Electric seeks a relaxation of technical standards in Part 18 of the FCC Rules to permit the introduction of a new family of consumer lighting products.

Lighting manufacturers have introduced Compact Fluorescent Lamps (CFLs) that utilize energy-saving fluorescent technology. This technology has the potential to satisfy pressing national needs to increase energy efficiency and reduce demand for new power generation facilities.

Current CFLs are larger than standard light bulbs, limiting possible uses and restricting consumer acceptance. Electrodeless Fluorescent Lamps (EFLs), a new generation of fluorescent technology, use higher radiofrequencies (RF) to generate light. EFLs are nearly identical in size and shape to incandescent bulbs. Additionally, EFLs do not use electrodes, which limited the life of earlier fluorescent products.

~~GE's~~ new product operates in the frequency range of 2.2-2.8 MHz. Currently, the Commission limits RF voltage conducted back into the power supply line to 48 dB μ V for consumer products. Satisfying this limit significantly increases costs to filter out RF emissions, limiting consumer acceptance and the promise of this new technology.

To meet this problem, European regulators have relaxed some limits and are considering additional relaxation in the 2.2-3.0 MHz band. Manufacturers, which operate in the international marketplace, need harmonized regulations to economically produce products for a global market.

General Electric, therefore, seeks a waiver of American standards in 47 CFR § 18.307(c) to increase permissible conducted voltage for consumer equipment in the 2.2-2.8 MHz band to 70 dB μ V, the current U.S. limit for non-consumer products. GE has eliminated 2.8-3.0 MHz from its request to avoid any possible conflict with American aviation users.

The dearth of interference complaints at current limits suggests that some relaxation is reasonable. Furthermore, the 2.2-2.8 MHz band does not overlap broadcasting bands, the most frequent concern in previous waiver and rulemaking proceedings. The users of this frequency are relatively few, and these licensees typically utilize sophisticated equipment with enhanced immunity to conducted RF voltage.

General Electric seeks an additional waiver to produce and test 100,000 units with conducted voltage of 92 dB μ V in the 2.2-2.8 MHz range, a proposal currently pending before international regulators.

GE's waiver would end in two years unless GE petitions for rulemaking to permanently incorporate new limits in Commission rules. The waiver would then continue in effect until the proceeding concludes. The waiver request also recognizes the Commission's legal right to terminate the waiver if objectionable interference results from these new products.

This procedure satisfies the Commission's longstanding preference that manufacturers test new products and new limits in the real world, rather than in the laboratory, and it fulfills Administration goals to reinvent government by making the Commission and industry partners in the introduction of energy-efficient technology.

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Petition of)
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General Electric Company) File No.
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For Waiver of 47 CFR § 18.307(c))

To: Chief, Office of Engineering & Technology

PETITION FOR WAIVER

1. General Electric Company ("GE"), by this Petition, seeks a temporary and limited waiver of limits on radio-frequency ("RF") lighting devices contained in Part 18 of the Commission rules. Specifically, GE seeks a relaxation of conducted line-voltage limits contained in 47 C.F.R. § 18.307(c), but only in the 2.2-2.8 MHz band, to permit the introduction of a new family of lighting products. The Commission has authority under 47 CFR § 1.3 to waive its rules upon a ~~showing of good cause~~. In adherence to 47 CFR § 1.958(a)(6), this Petition states the nature of the waiver requested and the reasons in support thereof, including the unique circumstances involved. Further, this Petition demonstrates that there is no reasonable alternative to this waiver within existing rules.

I. INTRODUCTION

2. RF lighting technology has made great strides since the introduction of the first practical compact fluorescent lamp ("CFL") in the early to mid 1980's. CFLs fit standard, screw-in

lamp bases, replacing less efficient incandescent bulbs. Although first-generation CFLs have been well received world-wide, saving millions of kilowatt-hours in electrical energy, limitations of the product have inhibited the realization of the full benefit. First-generation CFLs are too cumbersome to satisfy many consumer needs. See Exhibit 1, "CFL Products." The time is ripe for commercial development of a new and technically superior product: an Electrodeless Fluorescent Lamp ("EFL") with a longer life-span and a design that fits many more applications than the first generation. This technology allows GE to make an energy-saving lamp that looks and feels more like the familiar incandescent bulb, but retains the energy-efficiencies characteristic of the older CFLs. See Exhibit 2, "EFL Products." These features will improve public acceptance and usage, resulting in greater energy savings on a national level.

3. The technology for EFLs originated in the United States. But efforts to market this new product began in Europe utilizing the 2.2-3.0 MHz band. International standards have already changed to facilitate the commercial development of this important new technology. Additional revisions are currently being discussed. Undoubtedly, the European Union is aggressively targeting and adopting the new technology to reap the energy and pollution-reduction benefits by replacing older, less efficient incandescent lamps with the newer EFLs.

4. Given the European developments, the United States must move forward or fall behind in its ability to achieve not only the

end benefits of this new technology, but to remain competitive in the burgeoning world-wide development of advanced lighting technology. Our failure to embrace this new technology would also damage our commercial position in the global lighting industry.

5. To develop and introduce advanced EFL products in the United States consistent with international standards, some modifications of the Part 18 lighting provisions are necessary. However, pursuing a rulemaking would be premature before sufficient data has been developed to prove that there is no serious interference potential to existing radio users. This Petition thus proposes a method to develop reliable and practical data with sufficient safeguards to protect the public.

6. The Commission has historically permitted the introduction of innovative technologies by waiver, thereby allowing a realistic test of the technology, subject to the rigors of the marketplace, before instituting a rulemaking proceeding. See, e.g., Hye Crest Management, Inc., 6 F.C.C. Rcd 332 (1991) (granting five-year license for reallocation of 28 GHz band in Brooklyn for video distribution); RF Lighting Devices, 101 F.C.C.2d 813, ¶ 4 (1985) ("The purpose of the waiver was to allow prompt introduction of this new technology into the marketplace and to permit the Commission to gain further experience with regard to potential interference from these devices."); RF Lighting Devices, 94 F.C.C.2d 1351, ¶ 8 (1983) ("the Commission recognizes that technological advancements such as energy saving RF light bulbs and electronic ballasts should not be delayed access to the market as

long as adequate control is maintained over the interference potential of the new technology"). As the Commission itself noted, "In view of the large number of variables affecting the interference potential of RF lighting devices, a determination of the actual interference potential presented by these products is most practical through experience gained in actual use." RF Lighting Devices, 94 F.C.C.2d 1351, ¶ 16.

7. The relief requested by this Petition is not a broad, generalized and indefinite change in the rules such that it requires a rulemaking proceeding. See, e.g., MTS-WATS Market Structure (Resold Inward WATS), 2 F.C.C. Rcd 2409, ¶ 13 (1987). It instead seeks a waiver of limited duration that is subject to termination or modification by the Commission if necessary. As demonstrated below, grant of the waiver would serve the public interest and would not undermine any policy which the rules are intended to serve. See Hye Crest Management, Inc., 6 F.C.C. Rcd 332, ¶ 24 ~~n.16~~ (1991) (citing Wait Radio v. FCC, 418 F.2d 1153, 1157 (D.C. Cir. 1969)). Accordingly, grant of the requested waiver is the most appropriate -- indeed, the only reasonable -- method of adequately testing this new technology.¹

¹ Arguably, 47 C.F.R. Part 5 permits market studies of new technology. However, it appears doubtful that the Commission ever envisioned the use of Part 5 to test industrial, scientific and medical ("ISM") devices such as EFLs. See, e.g., 47 C.F.R. § 5.3(c) (defining "Experimental Radio Service" to be "for purposes of experimentation in the radio art or for purposes of providing essential communications for research projects . . ."). Moreover, Part 5 requires that the licensee retain ownership of all equipment used in a "limited" market study. 47 C.F.R. § 5.206. GE's waiver would not generate the necessary data on consumer acceptance, nor
(continued...)

II. WAIVER REQUESTED

8. GE requests a temporary and limited waiver of 47 CFR § 18.307(c). The Commission would retain full authority under statutes and Commission rules to expand, modify, or terminate the waiver at any time. Specifically, GE proposes that the Commission waive its existing limits on RF lighting devices as follows:

- a. Without limit on the number of units produced, permit GE to develop and market consumer RF lighting devices for which conducted RF line voltage would not exceed $70 \text{ dB}\mu\text{V}^2$ between the frequencies of 2.2 and 2.8 MHz.³ All RF line voltages outside the frequency range shall comply with the existing limits for consumer equipment specified in 47 CFR § 18.307.
- b. In addition to the request above, as a more limited test of higher limits, permit GE to market no more than 100,000 consumer units for which conducted RF line voltage would be a maximum of $92 \text{ dB}\mu\text{V}$ between the frequencies of 2.2 and 2.8 MHz. All RF line voltages outside the frequency range shall comply with the

¹(...continued)

would GE have the ability to underwrite a test large enough to provide meaningful information, if GE were required to retain ownership of all equipment. The Commission has long used waivers to investigate technological advances in ISM devices. The same procedure is appropriate in this case.

² This is the same limit permitted for non-consumer RF lighting devices; however, GE requests the waiver of the consumer limits only for the 2.2-2.8 MHz band. GE will also market this new product family for non-consumer applications, but no waiver is necessary for this version of the product under current rules.

³ Although international standards have raised radiated limits across the 2.2 to 3.0 MHz band, a small portion of this band is used in the United States for aeronautical communications. See 47 C.F.R. § 2.106 (2850-3028 kHz designated for aeronautical mobile). Accordingly, GE proposes to limit its test to a 2.2 to 2.8 MHz band to avoid any possible effects on aeronautical mobile users, at least until the lack of interference has been conclusively established.

existing limits for consumer equipment specified in 47 CFR § 18.307.

9. GE proposes the following terms and conditions on the waiver:

- a. Consumer equipment manufactured pursuant to this waiver shall be certified as provided in 47 CFR § 18.203(a) to comply with the waiver provisions and applicable rules.
- b. The waiver will be effective for a period of not less than two years. The waiver will remain in effect thereafter only so long as GE has petitioned for a rulemaking to change 47 CFR § 18.307(c) and/or other related rules. The waiver will expire when the Commission concludes the rulemaking.

10. GE will voluntarily undertake a program to assess this new technology. See ¶ 39, infra. If the results of the experimental program are favorable, the information gathered in this assessment program will support GE's rulemaking petition to be filed within two years of the grant of waiver.

III. PUBLIC INTEREST RATIONALE

Need for Technological Evolution.

11. Today's generation of Compact Fluorescent Lamps saves significant energy when used in place of the ubiquitous but comparatively inefficient incandescent bulb technology. While this first generation of CFL, generally operating at RF frequencies in the 30 kHz to 100 kHz range, has been well received in the marketplace, their relatively large size and shape make them incompatible with many common consumer lighting fixtures, thus limiting consumer acceptance and their potential to reduce energy needs. See Exhibit 3, "Energy Impact Rationale."

12. The newer technology utilizes a higher fundamental frequency to ionize the light-generating discharge. These higher frequencies allow smaller, lighter-weight designs that can more readily fit into many more common household lighting fixtures, enlarging the potential for national energy savings. For the first time, a fluorescent lamp will resemble the familiar light bulb.

13. In addition, the first generation of RF lighting utilizes conventional fluorescent electrodes that ultimately limit the practical life for such products. In lieu of electrodes, EFLs use an RF coupling coil which results in a second-generation lamp that easily doubles or triples the useful operating life of the lamp. See Exhibit 2, "EFL Products: EFL System Operation." Extended life should increase the appeal to consumers, resulting in additional sales that further reduce energy consumption when compared to incandescent bulbs and even CFLs. See Exhibit 3, "Energy Impact Rationale."

14. Historically, the Commission has exhibited greatest concern for potential interference in the home environment with AM broadcast and amateur radio equipment. See, e.g., RF Lighting Devices, 2 F.C.C. Rcd 6775, ¶ 7 (1987); RF Lighting Devices, 101 F.C.C.2d 813, ¶¶ 3, 8 (1985). The 2.2-2.8 MHz band is sufficiently separated from AM broadcast and ham radio to ameliorate these concerns. See 47 C.F.R. § 2.106 (Table of Frequency Allocations) (nearest broadcast frequencies at 1625-1705 kHz and 5950-6200 kHz; nearest amateur frequencies at 1800-1900 kHz and 3500-4000 kHz).

15. RF lighting technology, the subject of this Petition, is an American innovation. J.M. Anderson of General Electric Company described a practical low pressure discharge electrodeless lamp in U.S. Patent No. 3,500,118. American inventor Donald Hollister further modified the basic design in U.S. Patent No. 4,010,400. Industry must continue to invest in further development and obtain additional protection for new inventions. Grant of this waiver is necessary to permit continuing development of technology, pioneered in this country, and signals an awareness that the U.S. remains a strong technology competitor and is not being surpassed by other industrialized nations, including Japan. Grant of this waiver is also consistent with the Commission's express intention to support industry-sponsored change, including relaxation of standards, "as the technology develops." RF Lighting Devices, 2 F.C.C. Rcd 6775, ¶ 14 (1987).

Economic Growth in the World Marketplace.

16. ~~Businesses expecting to remain competitive must face the~~ reality of global markets, rather than focusing on separate domestic and foreign marketplaces. In the past, domestic manufacturers could economically target the U.S. marketplace alone. But foreign corporations have gained increasing shares of the U.S. market through various techniques, including the acquisition of existing businesses. Philips of the Netherlands acquired Westinghouse Electric's lighting business. OSRAM, a unit of Germany's Siemens Company, acquired GTE Sylvania's lighting business. Similarly, GE has acquired foreign lighting operations,

Thorn Lighting Limited of the UK and Tungsram of Hungary, to remain competitive in the global marketplace. Together, GE, Philips and OSRAM supply over 90% of the lighting products to the world; but of major manufacturers, GE is the only remaining U.S.-based operation.

17. In this industrial globalization, manufacturers must strive for productivity gains, manufacturing efficiencies and technological advancement to remain competitive. GE typically addresses these goals by manufacturing a family of products in one geographic location, which then supplies that family of products to the world market. By reducing the need for duplicate machinery and widely-scattered production, GE gains economies of scale and maintains consistent quality of the product. Ultimately, decentralization would translate into higher unit costs, making products non-competitive, and endangering GE's ability to compete over an extended period. GE's "center of excellence" approach maximizes manufacturing efficiency for a product family. By improving ~~efficiency~~ and productivity in one location, this approach benefits all product families by improving the competitiveness of the business as a whole.

18. The interest of national competitiveness in a global economy, therefore, requires harmonization of U.S. and international standards. Without harmonization, American manufacturers will be unable to economically produce products for a global market. International standards are already in place that

relax radiated limits on devices in the 2.2 to 3.0 MHz band.⁴ See, CISPR 15, International Special Committee on Radio Interference, International Special Committee on Radio Interference, Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment (4th ed. 1992). Manufacturers make lamps for Europe and America that operate at different voltages. But changing a lamp's operating voltage requires only minor changes in parts or design. Engineering and manufacturing lamps to operate at widely different frequencies will add significantly to overall costs and profoundly diminish economies of scale.

19. So far, international standards have been eased only for radiated energy limits in the 2.2-3.0 MHz band. Because of dissatisfaction with testing techniques in lower frequencies, the Commission has not imposed this type of limit on RF lighting devices operating under 30 MHz. See RF Lighting Devices, 3 F.C.C. Rcd 6097, ¶ 10 (1988). The Commission ~~instead~~ has found that conducted limits adequately address interference concerns in this frequency range. See RF Lighting Devices, 3 F.C.C. Rcd 6097, ¶ 17 (1988); RF Lighting Devices, 2 F.C.C. Rcd 6775, ¶¶ 9, 10 (1987). The requested waiver provisions in ¶ 8.a, supra, would provide a test of relaxed standards, but would retain the U.S. preference for measuring conducted voltage, rather than radiated fields.

⁴ GE, however, proposes to limit its test initially to a 2.2 to 2.8 MHz band. See note 3, supra.

20. A proposal pending before CISPR, the advisory group on international standards, would also relax conducted voltage to 92 dB μ V. The waiver provisions proposed in ¶ 8.b, supra, would permit a more limited test of these proposed CISPR RF line voltage limits. The 92 dB μ V level is above the level that has historically been permitted for RF lighting devices in the U.S.; thus, a volume limitation on devices using the higher level would allow a reasonable test of the technology while limiting interference risk. See also ¶ 39, infra.

21. If the Commission were to prohibit or even delay this important advance in the U.S. market, it would be a serious departure from its established policy of supporting American competitiveness in the world marketplace. See, e.g., Mobile-Satellite Services (Waiver to Use Maritime L-Band), 5 F.C.C. Rcd 4117, ¶ 9 (1990) ("early implementation . . . is crucial to U.S. operators and equipment providers in view of potential foreign competition"). ~~European-based manufacturers~~ would be free to develop this product line using technology pioneered by Americans. Meanwhile, American manufacturers would be stifled in their home base, at least until the end of the long rulemaking process. A waiver to permit introduction of this new product in the U.S. would appropriately level the playing field.

Promoting Energy Efficiency.

22. Reducing energy use is a national priority. Because electric lighting accounts for 20 to 25% of the electricity used annually in the United States, the federal government is

encouraging, and in some cases, compelling lighting manufacturers to produce more efficient products which will reduce energy use and the resulting pollution. See, e.g., Exhibit 4, "Environmental Impact Rationale." With nearly three billion incandescent lighting sockets in U.S. households alone, even moderate consumer acceptance of EFL technology would produce potential yearly savings of 953 million kilowatt hours. See Exhibit 3, "Energy Impact Rationale"; see also Exhibit 5, "Energy Impact/Implications of the Waiver Petition" (noting that each lamp produced and used under the waiver will save 48.95 pounds of coal, or 3.5 gallons of oil, or 525 cubic feet of natural gas annually; estimating consumer savings of \$1.4 billion if 10% of sockets converted to the new technology).

23. In its passage of the Energy Policy Act of 1992, the same House committee which oversees the Commission, the Energy and Commerce Committee, recognized the benefits of energy efficiency: "A principal purpose of the [Energy Policy Act of 1992] is to ~~improve~~ our environment, economy and energy security by promoting the efficient use of energy. The Committee believes that using energy more efficiently can help reduce the impact that energy use has on our environment. . . . The Committee also believes that efficiency helps the economy . . . through the development of efficient American technology that is used both here and abroad." H.R. REP. NO. 102-474(I), reprinted in 1992 U.S.C.C.A.N. 1956-57. The Act imposes efficiency standards on reflector lamps effective October 31, 1995 and DOE is expected to enact future standards to

make the nation's lighting stock more energy efficient. See Exhibit 6, "Waiver Implications of the Energy Policy Act of 1992."

24. Executive agencies are also promoting energy efficiency. The Environmental Protection Agency has recognized that the introduction of more energy-efficient lighting products will reduce pollution caused by power generation and consumption. See, e.g., 57 Fed. Reg. 60811 (1992) (describing EPA "Green Lights" program to accelerate replacement of older lighting equipment with newer, more efficient technologies). Recently the Department of Energy initiated discussions with lighting manufacturers to determine how new technologies can be introduced to the marketplace more quickly to further reduce energy consumption. See U.S. Dep't of Energy Workshop, "Accelerating Commercialization of High Efficiency Lighting Systems and Equipment," Washington, D.C., December 2, 1993. The General Services Administration has determined that energy efficiency is so crucial that it has issued an interim rule to require procurement of energy-efficient equipment and supplies. See General Services Administration Acquisition Regulation, 59 Fed. Reg. 3,657 (1994).

25. For new RF lighting technology, the FCC is the single government agency with regulatory and approval powers. But other agencies have policy concerns, including DOE, EPA, and GSA, as discussed above. In addition, the Department of Commerce preserves and promotes American commercial interests by working with industry to ensure job stability, job growth and technological leadership. By channelling and addressing these and other federal agency

concerns, this waiver is a practical way to "re-invent government" by considering related issues at one time rather than in piecemeal fashion, mirroring procedures used by Japan's highly successful Ministry of Trade & Industry (MITI). The waiver is a foundation for streamlined procedures to coordinate industry and diverse federal agencies. The FCC can demonstrate its commitment to these issues and its dedication to re-invention of government through its timely consideration of this proposal.

IV. ECONOMIC JUSTIFICATION

26. By permitting higher levels of conducted line voltage, the Commission will lower the cost of individual lamps. Reduced costs will increase customer acceptance and, therefore, maximize energy savings. Higher conduction limits reduce or eliminate the need for expensive filters or special lamp coatings that control emissions. Although the Commission has already established ISM frequencies, manufacturers are permitted unrestricted emissions only within very narrow bands. See 47 C.F.R. § 18.301. To meet out-of-band limits, manufacturers must add costly filters and emission-reducing lamp coatings to control emissions beyond the ISM band.

27. By permitting a moderate rise in conducted voltage to the level allowed for non-consumer RF lighting, see supra note 2, the retail price of each lamp should be about \$15.00, comparable to the price of first-generation CFLs. If tests prove that an increase to 92 dB μ V presents no significant interference potential, GE projects that the retail price of each lamp will decrease by more than

\$5.00. Conversely, GE projects that lamps which meet current standards will cost in excess of \$20.00. See Exhibit 7, "Summary: EFL Economic Comparison"; Exhibit 8, "EFL Economic Comparison." Current standards will make the second generation too expensive to assure reasonable market penetration, suppressing its potential to reduce energy demands nationally.

28. Under ¶ 8.a, supra, GE proposes no production limits. Nonetheless, both the manufacturing process and the marketplace will permit only a gradual increase in product sales. See Exhibit 9, "Summary of Waiver Product Volume Build Over the Projected Waiver Period." A Commission-imposed volume limitation would inevitably drive up product costs, reducing consumer acceptance. Reduced consumer acceptance would imperil a realistic test of interference potential. Equally important, without the economies of scale provided by unrestricted production, neither GE nor any other manufacturer would be able to introduce and test this new generation. See Exhibit 10, "Economies of Scale Associated with the Build Up of Production Volume." Moreover, the Commission's right to limit or end the waiver assures an additional margin of safety that negates risk.

29. Concededly, a more limited test is appropriate for higher conducted voltage limits under ¶ 8.b, supra, where there is a theoretically higher interference potential. The proposed volume limitations for this product line would appropriately allow the Commission to determine, without unacceptable risks to the users in the 2.2-2.8 MHz band, if existing standards are necessary.

Together, ¶¶ 8.a and 8.b provide adequate safeguards for a cautious, real-world test of both current and proposed CISPR standards.

V. INTERFERENCE POTENTIAL

30. The first generation of CFLs has been on the market for well over a decade. No significant interference problems have occurred in this period. RF Lighting Devices, 3 F.C.C. Rcd 6097, ¶ 18 (1988); Industrial, Scientific, and Medical (ISM) Equipment, 58 Rad. Reg. 2d (BNA) 1096, ¶ 18 (1985); cf. RF Lighting Devices, 3 F.C.C. Rcd 6097, ¶ 12 (1988) (noting "no complaints of harmful interference to Part 15 devices from RF lighting devices"); ISM Equipment, 58 Rad. Reg. 2d (BNA) 1096, ¶ 1 (noting "the continued rarity of incidences of interference from the operation of [all ISM] equipment").

31. GE's consumer complaint file for 1992 through 1994, the years of fastest CFL growth and most prolific use of RF lighting technology, shows no interference complaints involving radio services. A handful of complaints suggest that CFLs may interfere with infrared, remote-control channel selectors for consumer television receivers. See Exhibit 11, "Summary of Interference Complaints from RF Compact Fluorescent Products." The higher frequencies utilized by CFL's are sufficiently separated from infrared control systems to eliminate the potential for interference.

32. Initial tests have not demonstrated significant interference potential. A study by Dash, Straus & Goodhue

considered worst-case scenarios and found that interference was unlikely unless a product with conducted line voltage of 70 dB μ V were used within a relatively short distance (i.e., 2 to 3 meters) of a receiver operating on the same frequency. See Exhibit 12, "Interference Study Performed on the Electrodeless Compact Fluorescent Lamp,"⁵ at 31-37; see also Exhibit 13, "DS&G Interference Study Summary." Licensees utilizing the relevant frequencies typically utilize sophisticated equipment that is unaffected by conducted RF voltage. Id. at 38. The study also demonstrates that licensed users of 2.2 to 2.8 MHz are relatively few (id. at 22-24), and residential communication is not among customary uses in the band (id. at 19-21). The trend among licensees seems to be toward use of higher frequencies. Id. at 18. Thus, the likelihood of interference appears to be minimal or non-existent.

33. Experimental data and experience suggest it is reasonable to ~~relax-consumer~~ RF line voltage in the 2.2 to 2.8 MHz range. The waiver provisions proposed in ¶ 8.a, supra, would permit conducted voltage to the same level currently permitted for non-consumer devices. The active users of 2.2 to 2.8 MHz are most often ships

⁵ The interference study tested prototypes that are approaching, but do not yet achieve, emissions limits for some frequencies above those covered by the waiver. See Exhibit 12, "Interference Study Performed on the Electrodeless Compact Fluorescent Lamp," at 6. Before GE could produce and market lamps, the proposed waiver requires compliance with these and all other FCC standards and certification by FCC staff. See ¶ 9.a, supra. GE produced these early units for developmental and testing purposes only; they do not fully typify the product to be sold under conditions of the waiver.

at sea, aviation, offshore drilling sites and local governments. See Exhibit 12, "Interference Study Performed on the Electrodeless Compact Fluorescent Lamp," at 17-21. Because the base operations in this band are mostly non-residential, Part 18 already permits their exposure to RF lighting devices with conducted line voltage of 70 dB μ V. The mobile users are unlikely to be located within buildings or sites that would use either consumer or non-consumer RF lighting. Id. at 14. Because no interference has been demonstrated from non-consumer devices, which are more likely to be near 2.2-2.8 MHz base operations, extending the same limits to consumer devices appears to present an acceptably low interference risk.

34. The limits proposed in ¶ 8.b, supra, although significantly above conducted limits for devices currently operating outside ISM bands, do not create an unreasonable risk of interference. As noted above, the 2.2 to 2.8 MHz band does not overlap any broadcast or amateur frequencies where potential for interference is greatest. Furthermore, the Dash, Straus & Goodhue study indicates that base operations in the band typically use vertical antenna towers of 30 to 60 meters, usually located 120 meters or more from buildings. See Exhibit 12, "Interference Study Performed on the Electrodeless Compact Fluorescent Lamp," at 14, 37. Past commenters have noted minimal interference potential in similar situations. See RF Lighting Devices, 2 F.C.C. Rcd 6775, ¶ 7 (1987) (ARRL comments noting lack of interference to external radio antennas). But any theoretical study is only a crude

indicator of what may occur in actual practice. If current limits are too conservative, they add unnecessary costs to RF lighting products, limiting consumer acceptance and energy conservation. The proposed ¶ 8.b waiver provisions will generate real-world data that may help to reduce future product costs while assuring continued protection for radio users.

35. Considering the performance of RF lighting devices over the last decade, the risk of interference appears to be small. This request, however, controls development of both the technology and the market in a reasonable, practical manner. The proposal addresses the dilemma faced by the Commission in the induction cooking range proceedings:

there is no question that a complete study of the interference potential of the range is desirable and may be useful in more accurately balancing economic and technical trade-offs. However, such a study is time consuming -- too time consuming when it is a stated fact that these ranges have been developed and are waiting to be marketed.

Overall Revision of Part 18, 46 Rad. Reg. 2d (BNA) 977, ¶ 11 (1979). Grant of this waiver would permit a needed test of the technology without denying it to the consumer, and without delaying its energy-saving benefits to the nation.

VI. PROTECTIONS/LIMITATIONS

36. To ensure that the industry acts expeditiously to develop real-world data from such a waiver, GE requests that the Commission grant the waiver only for a duration of two years plus the time required to complete a meaningful rulemaking to establish new limits.

37. Unlike many prior waivers that authorized only a specific product, this request would allow development of a full and practical range of lighting products. GE envisions the introduction of a reflector and an A-Line⁶ lamp in various wattages. See Exhibit 14, "EFL Product Line." But the waiver would not allow GE to market any consumer product under this waiver until the Commission granted an appropriate certification for compliance with waiver standards and applicable rules. See 47 C.F.R. §§ 2.907, 2.1031-.1045, 18.203(a) (certification procedures). A product-by-product waiver would require Commission involvement in the introduction of each new product, although the evidence and justification for waiver would be the same. The requested waiver would permit GE to make timely response to the market in introducing new wattages.

38. The Commission may halt the test at any time if, counter to GE's expectations, valid reports indicate a serious interference ~~problem~~ with this new technology. Additionally, GE is ~~always~~ subject to Commission rules which give priority to radio users if objectionable interference should result from this new product line. See 47 C.F.R. § 18.111 to .115. Because the Commission retains the absolute power to protect against interference, there is little danger of unrestrained proliferation. Even under the most optimistic sales projections, manufacturing constraints and limited consumer awareness will permit only moderate growth in

⁶ "A-Line" is the industry term for the common light bulb shape.

distribution. See Exhibit 9, "Summary of Waiver Product Volume Build Over the Projected Waiver Period." If, contrary to the evidence to-date, a critical point is reached at which unacceptable interference appears, only natural market growth will permit GE and the Commission to locate that point.

39. GE will make ongoing interference assessments under the waiver. First, GE will include an advisory on all EFL product packaging: "This device may cause objectionable interference to the operation of a radio receiver. Such interference should be reported to [an individual named by GE to receive the complaints]. Second, GE will name a qualified individual to submit a quarterly report to Commission staff in Columbia, Maryland, summarizing incidents of interference, the investigation of the incidents, and actions taken to remedy interference. Third, GE will submit devices to Commission staff in Columbia for the Commission's technical investigations.

40. For all products marketed pursuant to ¶ 8.b, ~~supra~~, GE will provide details to Commission staff in Columbia of distribution and testing plans prior to marketing to determine and minimize potential risks to communications services. GE will ensure that products marketed pursuant to ¶ 8.b are distributed in a geographically-compact, relatively high-density area to test the potential for additive or cumulative interference. See Exhibit 15, "Plans for 92 dB Test."