

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

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

ORDER

Adopted: November 5, 2004

Released: November 9, 2004

By the Commission:

INTRODUCTION

1. In this Order, we address a Joint Petition for Clarification (Joint Petition) filed by XM Radio Inc. and Sirius Satellite Radio Inc. (the Satellite Radio Licensees)¹ requesting clarification of the Commission's *Order* in this proceeding.² In the *Order*, the Commission determined that there was no need to define out-of-band limits for radio frequency (RF) lights in the 2.45 GHz band. For reasons discussed below, we dismiss the Joint Petition and reject the Satellite Radio Licensees' request to prohibit the operation of RF lights in the 2.45 GHz band. We further affirm our decision to terminate the proceeding without prejudice to its substantive merits.

BACKGROUND

2. RF lighting devices produce light by using radio frequencies to stimulate gases 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.³ 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 1000 MHz. The primary reason for an AC power line-conducted limit is to reduce the level of radiated emissions from the power line, to which an RF light is connected, which acts as an antenna below 30 MHz. Between 30 MHz and 1000 MHz, interference is controlled through radiated emission limits. Part 18 also specifies different emission limits, both radiated and conducted, for consumer and non-consumer

¹ See Joint Petition for Clarification of Satellite Radio Licensees, ET Docket 98-42 (July 23, 2003).

² See *Order* in ET Docket No. 98-42, 18 FCC Rcd 11660 (2003).

³ 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 No. 20718, FCC 85-445 (rel. Aug. 21, 1985), 50 Fed. Reg. 36061 (1985).

RF lighting equipment.⁴ Consumer RF lighting equipment is equipment that is used or intended to be used by the general public in a residential environment.⁵ Non-consumer RF lighting equipment is equipment that is used in commercial and industrial environments. Part 18 does not currently include limits for radiated emissions above 1000 MHz for RF lights because the types of RF lights in existence at the time the rules were adopted were typically designed to operate at relatively low frequencies around 150 kHz, and did not radiate significant energy above this frequency. Under the existing rules, RF lighting devices operating above 1000 MHz must comply with the ISM miscellaneous field strength limits of Section 18.305(b) for out-of-band emissions.⁶

3. On April 1, 1998, the Commission adopted a *Notice of Proposed Rule Making (Notice)* in this proceeding.⁷ In the *Notice*, the Commission proposed changes to Part 18 to update the conducted emission limits for RF lighting devices operating in the 2.2-2.8 MHz band.⁸ The Commission also proposed more stringent out-of-band radiated emission limits for consumer and non-consumer RF lights in the 2400-2500 MHz (2.45 GHz) bands.⁹ In addition, because the existing regulations for RF lighting devices do not specifically include any radiated emission limits for RF lights operating at frequencies above 1000 MHz, the Commission proposed radiated emission limits for such products that are identical to the limits already in place for digital devices.

4. In response to the Commission's request for input on the appropriate out-of-band emission limits for RF lights operating in the 2.45 GHz band, the Satellite Radio Licensees submitted technical studies on the interference potential of RF lights to satellite radio operating in the 2320-2345 MHz band.¹⁰ At

⁴ See 47 C.F.R. § 18.305 (c). Radiated emission limits vary with the operating frequency of the RF light. For example, radiated emission limits for non-consumer RF lighting devices operating between 30-88 MHz is 30 $\mu\text{V/m}$, as measured at 30 meters; radiated emission limits for consumer RF lighting devices operating in the same frequency range is 10 $\mu\text{V/m}$, as measured at 30 meters. The Commission adopted the two-tier approach to emissions limits, with one set of limits for residential environments and another set of limits for business and commercial environments, to provide a reasonable balance between the need to control interference and the need to avoid unnecessary regulations and product costs.

⁵ See 47 C.F.R. § 18.107(g).

⁶ See 47 C.F.R. § 18.305(b). Part 18 specifies an out-of-band field strength limit of 25 $\mu\text{V/m}$ measured at a distance of 300 meters, which is equivalent to a limit of 2500 $\mu\text{V/m}$ at 3 meters, for miscellaneous ISM equipment generating less than 500 watts of power. Miscellaneous ISM equipment that generates more than 500 watts of RF power has a higher limit, which is proportional to the square root of the power. For example, the limit is 35 $\mu\text{V/m}$ at 300 meters for equipment generating 1000 watts of RF power, and 100 $\mu\text{V/m}$ at 300 meters for equipment generating 2000 watts of RF power.

⁷ See *Notice of Proposed Rule Making (Notice)* in ET Docket No. 98-42, 13 FCC Rcd 11307 (1998).

⁸ See *Notice* at 7. In the *Notice*, the Commission proposed to increase the AC power line conducted emission limit by 10 dB in the 0.45-30 MHz band for non-consumer RF lighting devices and by 22 dB in the 2.2-2.8 MHz band for consumer RF lighting devices.

⁹ In the *Notice*, the Commission proposed to tighten the radiated emission limits above 1000 MHz for both consumer and non-consumer RF lighting devices. The Commission noted that although earlier RF lighting technologies did not radiate significant energy above 1000 MHz, microwave RF lights may radiate significant energy across a broad range of microwave frequencies, potentially causing interference to other services near the 2.45 GHz band. See *Notice* at 12.

¹⁰ See e.g., Sirius and XM Radio *Ex Parte* Presentation, ET Docket No. 98-42 (Oct. 18, 2000); Sirius and XM Radio *Ex Parte* Presentation, ET Docket No. 98-42 (Dec. 5, 2000).

the Commission's request, the principal proponent of 2.45 GHz RF lights, Fusion Lighting Inc. (Fusion), and the Satellite Radio Licensees undertook joint tests to quantify the impact RF lights would have on satellite radio receivers.¹¹ Over the course of the proceeding, spanning more than four years, Fusion and the Satellite Radio Licensees submitted various proposals suggesting out-of-band limits for RF lights based on Fusion technology that would protect satellite radio receivers from harmful interference, ultimately, however, the parties failed to reach agreement.¹²

5. On June 9, 1999, the Commission adopted a *First Report and Order* in this proceeding that adopted less stringent conducted emission limits for RF lighting devices operating in the 2.51-3.0 MHz band, but deferred action on changes to the rules for RF lighting devices operating in the 2.45 GHz band to a future date.¹³ Subsequently, Fusion informed the Commission that it is no longer pursuing development of RF lights that operate in the 2.45 GHz band.

6. On May 27, 2003, the Commission adopted an *Order* terminating this proceeding as it found that with the passage of time, the record of the proceeding had become outdated and, furthermore, that Fusion, the only party that expressed interest in producing RF lights in the 2.45 GHz band, had ceased operations in this area. In the *Order*, the Commission concluded that there did not appear to be a need for further Commission action in defining out-of-band limits for RF lights in the 2.45 GHz band at that time. The Commission therefore decided to terminate the proceeding without prejudice to its substantive merits and stated that should any party wish to pursue the issues in this proceeding in the future, the Commission would evaluate them in the context of a new proceeding.¹⁴

7. On July 23, 2003, the Satellite Radio Licensees submitted a Joint Petition for Clarification in this proceeding, in which they seek specific clarification that RF lighting devices will not be permitted to operate in the 2.45 GHz band and that "before the Commission considers permitting any such operations, it will either establish another rulemaking, or provide ample notice to affected parties such as the Satellite Radio Licensees."¹⁵

DISCUSSION

8. In the Joint petition, the Satellite Radio Licensees state that the Commission has historically treated RF lighting devices as a distinct class of Industrial, Scientific and Medical (ISM) devices, given their potential to interfere with licensed radio services. The Satellite Radio Licensees further state that the Commission started this proceeding to "determine the appropriate regulations necessary to protect communications services while facilitating development and use of a new generation of energy-saving

¹¹ See Joint Supplemental Comments of Sirius and XM Radio, ET Docket 98-42 (May 4, 2001).

¹² See, e.g., Sirius and XM Radio *Ex Parte* Presentation, ET Docket No. 98-42 (April 8, 2002); Joint Supplemental Comments of Sirius and XM Radio, ET Docket No. 98-42 (May 4, 2001). See also, Letter from Terry G. Mahn, Counsel for Fusion, to Ms. Magalie Roman Salas, FCC, ET Docket No. 98-42 (June 18, 2001), at 1.

¹³ See *First Report and Order* in ET Docket No. 98-42, 14 FCC Rcd 9840 (1999). The Commission changed the originally proposed frequency band to 2.51-3.0 MHz to harmonize with international standards.

¹⁴ See *Order* at 1.

¹⁵ See Joint Petition of Satellite Radio Licensees at 1.

RF lighting devices.”¹⁶ The Satellite Radio Licensees note that in the *Notice*, the Commission had emphasized the potential interference of RF lights operating in the 2.45 GHz band to satellite radio systems operating in the 2320-2345 MHz band.¹⁷ The Satellite Radio Licensees reiterate that, unlike microwave ovens and other unlicensed devices which operate primarily indoors and for short duration, RF lights in the 2.45 GHz band are intended to be (i) operated continuously; (ii) located in close proximity to one another creating aggregate interference; (iii) located primarily in outdoor environments to illuminate highways, streets and parking lots, in close proximity to satellite radio receivers; and (iv) mounted on poles in direct line-of-sight with, and thus within a few meters of, satellite radio receivers.¹⁸

9. The Satellite Radio Licensees further assert that they have submitted evidence that some RF Lights manufactured by Fusion exceeded the miscellaneous ISM out-of-band emission limits that they were required to comply with, and that the Commission did not assess this evidence in terminating this proceeding.¹⁹ The Satellite Radio Licensees contend that in terminating the proceeding by the *Order*, the Commission has left satellite radio vulnerable to interference from RF lights that may seek to operate at the ISM miscellaneous out-of-band emission limit in the future.²⁰ Finally, the Satellite Radio Licensees urge the Commission to clarify that RF lights are prohibited from operating in the 2.45 GHz band, unless and until the Commission concludes a new rulemaking in which a specific out-of-band limit is adopted for 2.45 GHz RF lights. To the extent that this relief is not given, the Satellite Radio Licensees request that the Commission provide potentially affected parties, including the Satellite Radio Licensees, an ample notice and opportunity to comment.²¹

10. We observe that the Satellite Radio Licensees stated that interference to their satellite operations was caused by some of the Fusion RF lights that did not meet our existing out-of-band ISM miscellaneous limits.²² However, we disagree with the Satellite Radio Licensees’ argument that by terminating the proceeding by the *Order*, the Commission has left satellite radio vulnerable to interference from RF lights operating in the 2.45 GHz band. There is no reason to believe that future RF lights designed by Fusion or any other party would be produced using the same unsuccessful design, the same operating frequencies or exhibit the same characteristics as evaluated in the Satellite Radio Licensees’ Supplemental Comments.²³ Furthermore, Fusion no longer develops or manufactures RF lights in the 2.45 GHz band and we are not aware that any other party is developing RF lights that would operate in this band.

11. We note that RF lights are already covered under our existing Part 18 rules and compliant

¹⁶ Joint Petition at 7 quoting NPRM at 3.

¹⁷ NPRM at 12.

¹⁸ Joint Petition at 8.

¹⁹ See Joint Petition at footnote 18.

²⁰ Joint Petition at 8.

²¹ *Id.*, at 9.

²² See Joint Petition at 5-6 and Joint Supplemental Comments (Joint Supplemental Comments) of Sirius and XM Radio, ET Docket No. 98-42 (March 4, 2001), at 9.

²³ See Joint Supplemental Comments.

equipment can be authorized according to our equipment authorization procedures.²⁴ Although traditional low-frequency RF lights are treated as a distinct class in Part 18,²⁵ microwave RF lights are subject to existing out-of-band radiated emission limits applicable to microwave ovens and other miscellaneous ISM equipment operating in the 2400-2500 MHz band. Moreover, we emphasize that RF lights, like all Part 18 equipment, must operate under the non-interference restriction of section 18.111(b) of our rules.²⁶ Under the rules, the operator of such equipment must promptly take all necessary steps to eliminate harmful interference to any authorized radio service, even if the equipment otherwise complies with the rules. Hence we find that there is adequate recourse against potentially harmful interference to satellite radio receivers under the provisions of this section.

12. We therefore decline to provide the requested relief from the Satellite Radio Licensees to prohibit operation of all RF lights in the 2.45 GHz band, as we find that the requested prohibition is overarching and is not warranted based on the circumstances. If there is evidence that any entity will seek to operate RF lights in the 2.45 GHz band and cause harmful interference to satellite radio receivers as a consequence, and our existing limits prove inadequate, we will at that time take appropriate action.

13. Based on the foregoing, we affirm our decision to terminate the proceeding without prejudice to its substantive merits, and hereby dismiss the Joint Petition for Clarification from the Satellite Radio Licensees.

ORDERING CLAUSE

14. Accordingly, IT IS ORDERED that pursuant to the authority contained in Sections 4(i), 301, 302, 303(e), 303(f), 303(g) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f), 303(g) and 303(r), the above mentioned proceeding IS TERMINATED without prejudice to its substantive merits, and the Joint Petition for Clarification filed by the Satellite Radio Licensees IS DISMISSED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

²⁴ See 47 C.F.R. §18.203. Consumer ISM equipment are authorized under either the Declaration of Conformity or Certification procedure prior to use or marketing. Non-consumer ISM equipment are subject to the verification procedure. See also, 47 C.F.R. §§ 2.902, 2.906 & 2.907.

²⁵ See 47 C.F.R. §18.305(c).

²⁶ See 47 C.F.R. §18.111.