

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Proposed Changes in the Commission’s ) ET Docket No. 03-137  
Rules Regarding Human Exposure to )  
Radiofrequency Electromagnetic Fields )  
 )  
To: The Commission )

**Via the ECFS**

**COMMENTS OF IEEE 802**

IEEE 802<sup>1</sup> hereby respectfully offers its Comments on the Notice of Proposed Rulemaking (the “NPRM”) in the above-captioned Proceeding.<sup>2</sup>

The members of the IEEE 802 that participate in the IEEE 802 standards process are interested parties in this proceeding. IEEE 802, as a leading consensus-based industry standards body, produces standards for wireless networking devices, including wireless local area networks (“WLANs”), wireless personal area networks (“WPANs”), and wireless metropolitan area networks (“Wireless MANs”).

IEEE 802 is an interested party in this Proceeding and we appreciate the opportunity to provide these comments to the Commission.

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<sup>1</sup> The IEEE Local and Metropolitan Area Networks Standards Committee (“IEEE 802” or the “LMSC”)

<sup>2</sup> This document represents the views of the IEEE 802. It does not necessarily represent the views of the IEEE as a whole or the IEEE Standards Association as a whole.

## INTRODUCTION

1. IEEE 802 notes that the Commission has been involved with human exposure issues for many years, starting with the adoption of basic guidelines to protect workers and the general public almost 3 decades ago. The Commission has been diligent in working with industry on the study of RF effects and the formulation of Specific Absorption Rate ("SAR") values. The research results have shown so far that RF effects are primarily thermal. We note that the studies largely focused on cellphone usage and have not specifically addressed WLAN devices that typically operate in different conditions.
2. In 1996 the National Environmental Policy act was adopted, which required government agencies to evaluate the effects of government actions and procedures on the quality of human environment. The Commission addressed this issue in earlier rule makings<sup>3</sup> and also addressed the RF radiation issue by issuing several guidelines. One guideline was developed to answer basic consumer questions<sup>4</sup> and several others were developed to help industry evaluate their RF devices against applicable RF limits.<sup>5</sup>
3. Requirements for RF radiation were addressed in Parts 1 and 2 of the Commission's rules and are referenced in several of the specific radio sections, including Part 101, Part 90, Part 24 and Part 1
4. The industry has also been active in the development of appropriate test methodology <sup>6</sup> as well as the development of testing equipment, including the composition of test material to accurately simulate human tissue for measurement purposes.

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<sup>3</sup> See ET Docket 93-62 Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation and the 1997 Second Memorandum and Opinion.

<sup>4</sup> Reference OET Guide 65

<sup>5</sup> Reference OET Guide 65, as well as supplements A, B, and C

<sup>6</sup> Reference IEEE Standard 1528, ANSI C95.1, and equivalent ETSI and International Standards .

5. With the increasing awareness of the importance of RF safety by the public and the profusion of RF based products that must meet the standards for RF exposure as well as provide guidelines for use of various wireless products, this proposed rulemaking is a timely opportunity in helping to establish an efficient RF exposure testing methodology.

**COMMENTS ON ROUTINE EVALUATION AND CATEGORICAL EXCLUSION OF TRANSMITTERS, FACILITIES AND OPERATIONS**

6. We concur with the Commission that the industry would be better served by a more consistent set of rules governing RF exposure limits. The factors of power, distance, frequency, and user proximity should be primary in determining appropriate SAR limits and minimizing RF energy intercepted by human tissue.

7. We think that the Commission should be clearer in the specification of transmit power for exposure. Exposure limits should be specified in terms of power density such as is currently stated in 47CFR 1.1310.

8. We support the Commission's proposal of categorically excluding from this requirement those devices that meet the distance threshold of 20 cm and the power limit of 1.5 W ERP at or below 1.5 GHz and 3 W ERP above 1.5 GHz. We note that even though many Part 15 devices were categorically excluded by the rules they were required as a matter of standard practice to be tested regardless.

9. Therefore, while we support categorically excluding certain devices as per paragraph 14 of the NPRM, we urge the Commission to adopt clearer guidelines in this area to eliminate last minute problems and costs when certifying a categorically excluded device. This categorically exclusion from routine examination is in line with the requirements in OET 65 C (01-2001) for low power devices.

10. With the exception of a very few rare cases, indoor installations of 900 MHz, 2.4 and 5 GHz Access Points do not exceed the 3W ERP and many operate well below that level. In accordance to the requirements set forth in OET 65 C, manufacturers provide installation information instructing the installer to locate the antennas in such a way as to insure at least 20 cm separation distance for these fixed and mobile locations. The exclusion of these low power systems from exposure assessment will eliminate the requirement of performing unnecessary routine evaluations.

11. This will also address the problem of providing conflicting installation instructions as manufacturers will then only need to provide instructions informing the installer that access points must be at least 20 cm from the user or general public.

12. IEEE 802 supports the Commission's amendments for higher power systems and also supports clarifying power thresholds for consideration of categorical exclusions. We believe the guidelines set out for use of high gain directional antennas will not cause undue difficulties for the system installer. It is understood that systems operating at or below the exclusion thresholds but closer than the recommended distance of 20cm are required to be evaluated for either MPE<sup>7</sup> or SAR

**COMMENTS ON REQUIREMENTS FOR EVALUATING SAR FOR CERTAIN  
SECTION 15.247 UNLICENSED DEVICES**

13. IEEE 802 commends the Commission on addressing Part 15 .247 spread spectrum and Digital Transmission Devices with regards to RF exposure. Numerous products operate under this rule including cordless phones, Bluetooth, and 802.11 (b/g) RLAN devices. We believe that U-NII devices operating under Part 15.407 should be brought under the same RF Exposure guidelines as Part 15.247 devices.

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<sup>7</sup> Maximum Permissible Exposure

14. We support the Commission's view that a 100 mW Part 15 device operating at either 900 MHz or 2.4 GHz does not exceed the 1.6 W/kg level, as stated in the NPRM. Therefore we support allowing the exemption from routine testing and filing of data for those Part 15.247 devices operating at 100 mW or less and, by extension, U-NII devices operating under Part 15.407.

15. However we request that the Commission clarify the situation with regards to device transmit power and RF exposure in this area. Our understanding of section B of this proceeding would indicate that the transmit power threshold is 100 mW peak, which is a conducted value. The FCC and TCB grants issued also reflect maximum conducted power unless stated otherwise. Antenna gain does not appear to be considered in the threshold value proposed by the Commission. Accordingly, we would ask that the Commission revise this section of the NPRM to consider antenna gain and/or near field effects in the exclusion threshold.

16. With regards to RF safety information, we believe that including samples of the warning labels and informational disclosures within user manuals along with applications should be sufficient. We do not see the need to add additional material to Supplement C of OET 65, nor the separate publication of safety information.

#### **COMMENTS ON RF EVALUATION REQUIREMENTS FOR TRANSMITTER MODULES**

17. From 1995 onward, the FCC Authorization Branch has allowed certification of radios as modules for systems operating under Part 15.247 of the rules. This allowed the radio manufacturer to produce one base radio he could install in numerous host devices without re-certifying the radio in each host. This requirement was formalized in early 2000 as part of the instruction set for TCBs.<sup>8</sup>

18. The unresolved issue with host-independent devices was addressing the RF exposure aspects of these devices. This issue was discussed in several forums including the FCC-

instructed TCB training. The concern voiced by both reviewers and manufacturers was how to ensure compliance and the development of thresholds for exemption.

19. IEEE802 commends the Commission for making efforts to address this issue by developing guidelines for Host Independent Devices<sup>9</sup>. We further support the approach of treating the issue of multiple hosts as a Class 1 category change under Part 2 of the rules. We agree that a Class II change for a device would be required in the event of an increase in the SAR value when installed in a different host category.

20. We have some concerns with regard to the various threshold power levels suggested by the Commission for installation in the different host devices. In most cases, the manufacturer of an RLAN card does the product evaluation, however, under the new proposal the burden could be shifted in part to the host device manufacturer. This could present difficulties for a Class I change for the system integrator, as he cannot evaluate the changes when it is the grantee that has this responsibility per Part 2 of the rules<sup>10</sup>.

21. IEEE802 supports the view of the Commission that Part 15.247 devices can be certified as modules and we suggest that Part 15.407 devices should also be certifiable as modules.

22. However it is understood that to obtain a module approval as a "Host Independent Device" that a Part 15 transmitter would be required to be evaluated if its maximum transmit power exceeds the exclusion transmitter power threshold for the host device.

23. Unfortunately, it is not clear to us if radio modules need to be tested in the actual host systems or if the industry will be allowed to test them on reference test platforms and simulate the various positions on antenna placement for each type of device. Currently, there is no standard test procedure for evaluating SAR of Part 15 devices and therefore we urge the

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<sup>8</sup> Public Notice (DA 00-1407, 15 FCC Red 25,425 (2000))

<sup>9</sup> The term "Host Independent Devices" and their definition was derived from input from both the RLAN Industry members and the FCC at the 2001 TCB training on SAR.

<sup>10</sup> Reference 4 CFR Parts 2.909, 2.931, 2.932

Commission to work with industry standards groups to develop a SAR test standard for these devices.

24. IEEE 802 would strongly urge the Commission to allow such test platforms to avoid potential issues encountered with using a variety of custom host platforms. However, the Commission should not preclude future innovative designs by limiting testing only to reference test platforms.

25. IEEE 802 concurs with the Commission that multiple transmitters could be incorporated into a host device (e.g., a laptop) without raising SAR concerns provided that the aggregate power level did not exceed the Commissions' suggested power levels for that host, e.g. the value of 200 mW for screen-mounted devices in a laptop and 10 mW for keyboard located devices.

#### **COMMENTS ON MEASUREMENT OF SAR FROM MULTIPLE TRANSMITTERS**

26. IEEE 802 supports the Commission's view that simple SAR summation of multiple transmitters would be the simplest and most conservative method of estimating overall SAR values.

#### **COMMENTS ON REFERENCE TO OET BULLETIN 65**

27. IEEE 802 supports the Commission's decision regarding the standards associated with the testing methodology for SAR. We support removing the specific standards and versions from the technical rules under Part 2<sup>11</sup> and instead referring to the most recent edition of OET 65 C. We also support the continued inclusion of the outputs of relevant research groups such as IEEE SCC 28 and SCC 34 into SAR value determinations.

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<sup>11</sup> Specifically Part 2.1091(d)(3) and 2.1093 (d)

## **COMMENTS ON LABELING REQUIREMENTS FOR CONSUMER PRODUCTS**

28. We believe that devices compliant with the distance and power requirements for low RF exposure should not be required to carry the same labeling as higher power devices. We agree with the FCC on the “trigger” points for labeling requirements as applied to Part 15.247 devices. IEEE supports documentation of RF safety concerns and publication of caveats related to safe installation of devices.

29. On matter of incorporating RF safety “cut-off” switches, we do not believe that devices operating under Part 15.247 and 15.407 would require such circuitry.

## **COMMENTS ON SPATIAL AVERAGING FOR EVALUATING COMPLIANCE**

30. The “spatial-averaging” issue raised by the Commission is considered unnecessary as IEEE Standard C95.3 (1999) addresses this problem in some detail. We believe that the Commission should continue to use the IEEE standard as their primary reference point.

## **COMMENTS ON TRANSITION PERIOD**

31. We concur with the Commission on the adoption of a six month transition period for device manufacturers to become familiar with evaluation rules for devices that previously were excluded but may not be so under new guidelines. However we recommend that new rules become effective immediately and allow the old rules to remain in effect concurrently for six months after the effective date of the new rules. This would provide for a smoother transition by allowing devices complying with the new rules to be sold immediately while allowing a grandfather period for devices that comply with the old rules.

## SUMMARY

32. IEEE 802 commends the Commission for actively supporting research into the development of practical and consistent RF exposure values and measurement guidelines. We thank the Commission for recognizing the importance of SAR and RF safety and the dependency of tests on the physical configuration of the device being tested and the power levels used. We appreciate the opportunity to provide additional comments on this issue and look forward to continued involvement in the regulatory process established by the Commission.

Respectfully submitted,

/s/

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