

FCC Upholds Existing Radiofrequency Exposure Standards, Streamlines Implementing Regulations, and Seeks Comment on Further Technical Proposals

December 6, 2019

On December 4, 2019, the Federal Communications Commission (FCC or Commission) released an item revisiting its radiofrequency (RF) emission rules for the first time since 2013 and seeking comment on proposals to, among other things, expand the range of frequencies subject to RF exposure limits. The item comes at a critical time as efforts to deploy 5G products and services gain momentum. All five Commissioners unanimously voted to:

- affirm existing RF emission exposure limits and terminate its inquiry into revising these standards further;
- amend implementing rules, including criteria for exemption from RF exposure evaluation, requirements for establishing compliance with RF exposure limits, and methods to mitigate RF exposure risks;
- seek comment on proposals to adopt additional RF emission exposure limits for devices operating in gigahertz frequencies and extend these limits to terahertz frequencies, as well as seek comment on proposals to permit wireless power transfer (WPT) equipment under Part 15 and Part 18 of the Commission's rules subject to compliance with specified exposure limits; and
- affirm the Commission's prior ruling that the pinnae (the outer ears) are considered extremities for purposes of the agency's RF emission exposure rules.

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The FCC's action upholds the sufficiency of existing regulations and terminates the inquiry into the need to revise these standards, finding that there is no basis in the record to conclude these standards need to be revised. However, the technical proposals in the FCC's action will affect a broad swath of stakeholders, including wireless carriers, device manufacturers, broadcasters, satellite earth station operators, microwave operators, medical equipment manufacturers, and innovators developing connected devices. Industry engagement during the next steps of the proceeding will be critical, particularly as next-generation 5G technologies are developed and deployed.

Resolution of Notice of Inquiry

The FCC maintained its existing RF exposure limits, resolving and terminating the agency's *2013 Notice of Inquiry* to review the Commission's exposure standards and related policies. (¶¶ 10-16). The *2013 Notice of Inquiry* sought comment on RF exposure limits, reduction policies, and evaluation; consumer information; proximity restrictions; and disclosure requirements for portable RF devices.

The Commission, relying on conclusions from expert health agencies, determined that there is no appropriate basis justifying reevaluation of existing RF exposure limits. It noted that no expert health agency expressed concern about the Commission's existing RF exposure limits and that agencies including the Food and Drug Administration continue to support existing limits. The Commission found that "no scientific evidence establishes a causal link between wireless device use and cancer or other illnesses."

Of note, the Commission rejected proposals to revise its RF exposure standards to be consistent with international standards like the IEEE or ICNIRP RF standard, which the Commission views as less-restrictive. The FCC also declined to modify its RF exposure evaluation procedures for consumer portable devices, which must be tested at maximum power under normal use conditions. For cell phones, this means testing against the head to simulate phone call use and testing with a separation distance of up to 2.5 cm from the body to simulate other forms of cell phone use. The Commission, reaffirming these standards, denied proposals by some commenters to require testing with zero spacing (*i.e.*, against the body). The agency reasoned that given existing testing procedures and exposure limits, any exposure against the body would pose no health risks.

Second Report and Order

The FCC also amended its implementing rules with respect to exemption and evaluation of RF exposure limits, as well as RF exposure mitigation methods.

Exemption. The Commission adopted new exemption criteria, which are based on a set of formulas for single and multiple sources of RF emissions of fixed, mobile, and portable transmitters based on power, distance, and frequency. (¶¶ 20-23). The formulas will be used to determine whether the device falls under one of three RF exemption classes: (1) low-power devices transmitting at 1 mW or below; (2) higher-power devices with transmitting antennas operating within 40 cm of the body and below localized specific absorption rate (SAR) limits; and (3) all other transmitters operating below maximum permissible exposure (MPE) limits. Thus, rather

than the previous practice of applying exemptions by service class or operational presumption, the new exemption rules consider the distance between the RF source and the potentially-exposed human.

Evaluation. For cases where an exemption does not apply, the FCC broadened the methodologies that applicants may use to determine potential RF exposure levels in the RF evaluation process. (¶¶ 69-70). The Commission will now accept “any valid computational method” used in demonstrating compliance with RF exposure limits, rather than specifying acceptable approaches. Going forward, bulletins from the Office of Engineering and Technology (OET) and the OET Knowledge Database (KDB) will list acceptable evaluation methods for various applications. Applicants may also seek approval from OET staff to use other computational or measurement methods. This rule change is intended to provide greater flexibility for evolving mobile and portable device technology.

In addition, the Commission eliminated the 5-cm minimum separation requirements for measurements used to demonstrate compliance for devices operating above 6 GHz. (¶ 70). The agency concluded the requirement has been superseded by technological developments that now allow for safe transmission closer to the human body.

Mitigation. The FCC adopted new rules to improve RF exposure mitigation measures by specifying access restrictions and other mitigation techniques where RF exposure exceeds prescribed limits. (¶¶ 80-81). Specifically, the Commission clarified licensees’ obligations to provide adequate access restrictions, signage, and training to improve safety for both workers and members of the general public permitted to enter a restricted area.

Notice of Proposed Rulemaking

The Commission seeks comment on proposals to apply additional or new RF emission exposure limits to millimeter-wave and sub-millimeter wave frequencies, as well as proposals to establish exposure limits for WPT devices. (¶¶ 119-21). Specifically, the FCC seeks comment on:

- expanding the range of frequencies—currently 100 kHz-100 GHz—subject to the FCC’s RF exposure limits. This includes comment on whether to extend existing rules on localized (*i.e.*, SAR) exposure limits from 100 KHz-6 GHz to frequencies above 6 GHz and whether to extend the existing rules on generalized (*i.e.*, MPE) exposure limits from 6 GHz-100 GHz to frequencies as high as 3,000 GHz (3 THz);
- specifying, as part of the evaluation compliance process, conditions and methods where exposure limits may be averaged in both time and area; and
- new RF emission exposure limits to enable operation of WPT devices under Part 15 and Part 18 of the FCC’s rules.

Through these targeted proposals, the Commission hopes to develop a record that will assist the agency in addressing new challenges and enable new opportunities by advancing technology.

Memorandum Opinion and Order

The FCC affirmed its prior ruling that the pinnae, or outer ears, are classified in the same manner as other bodily extremities for purposes of evaluating SAR—dismissing and alternatively denying a petition for reconsideration filed by the American Association for Justice (AAJ). (¶¶ 148-49). The Commission concludes that the AAJ did not raise new facts or arguments, nor demonstrate errors or omissions in the agency's previous decision.

Far Reaching Effects of FCC Action

The Commission's actions signal a vote of confidence in existing radiofrequency emissions standards, and once again restate that there is no reason to believe that these standards are insufficient to protect the public. Nevertheless, the further action proposed by the agency will affect numerous stakeholders. **Wireless carriers, device manufacturers, broadcasters, satellite earth station operators, microwave operators, and medical equipment manufacturers** should consider whether to engage, as the FCC contemplates expanding SAR exposure limits to frequencies above 6 GHz and MPE exposure limits to frequencies as high as 3 THz. This is especially important for those with products and services operating on higher frequencies, including those supporting 5G.

Wireless carriers, device manufactures, microwave operators, medical equipment manufacturers, and others interested in developing new products and services will want to follow Commission action on proposals regarding WPT devices, which will affect IoT and similar systems.

Some may benefit from the new exemption criteria—particularly the exemption for low-power devices transmitting at 1 mW or below. Others, such as **microwave operators** (particularly point-to-point operators), may find it more difficult to qualify for an exemption, since the revised criteria rely on formulas based on antenna power, distance, and frequency rather than service class.

New mitigation requirements may affect deployment and maintenance of **wireless carrier, broadcaster,** and **satellite earth station operator** networks with respect to training, signage, and access control procedures for areas exceeding established RF exposure limits. Changes may be necessary to ensure safety for tower climbers and other workers in and around RF exposure areas. And these new rules could affect pending lawsuits regarding RF exposure.

Conclusion

The FCC's action broadly upholds existing RF standards as being sufficient to protect the public. However, the agency has proposed a number of technical changes to its regulations that will be of interest to a variety of stakeholders. Operators and device manufacturers across industries should consider engagement in this proceeding. While it has affirmed the sufficiency of its existing RF emission exposure limits, the Commission is poised to extend these exposure limits to frequencies as high as 3 THz and establish limits for WPT devices. This would affect existing and future devices operating on millimeter and sub-millimeter bands, including many

5G devices. And modifications to the FCC's implementing rules—namely, RF exemption criteria, evaluation methodologies, and mitigation requirements—will affect how communications networks are deployed and maintained.