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

In the Matter of	)	
	)	
Amendment of Part 90 of the Commission's Rules	)	WP Docket No. 07-100
	)	
Modernization of Part 90 of the Commission's Rules for Next Generation Operations	)	RM-_____

PETITION FOR RULEMAKING

Pursuant to Section 1.401 of the Commission's rules, the Association of Public-Safety Communications Officials International, Inc. (APCO)[1] hereby requests the Federal Communications Commission ("Commission") to revise Section 90.1215 of its rules, as described further in Attachment A, to permit 5G macrocell deployments in the 4940-4990 MHz band ("4.9 GHz band").[2]

APCO commends the Commission for its efforts to optimize public safety use of the 4.9 GHz band and spur innovation by enabling the integration of the latest commercially available technologies, such as 5G. By adopting a Band Manager framework that contemplates sharing unassigned spectrum with the First Responder Network Authority ("FirstNet"), the Commission has taken an important step toward enabling more robust public safety use of the band.[3] The Commission should continue to build on this momentum by making complementary revisions to the 4.9 GHz technical rules to align them with the parameters necessary for 5G deployments.

[1] Founded in 1935, APCO is the nation's oldest and largest organization of public safety communications professionals. APCO is a non-profit association with over 40,000 members, primarily consisting of state and local government employees who manage and operate public safety communications systems – including 9-1-1 Emergency Communications Centers (ECCs), emergency operations centers, radio networks, and information technology – for law enforcement, fire, emergency medical, and other public safety agencies.
[2] *See* 47 CFR § 1.401.
[3] *See* Amendment of Part 90 of the Commission's Rules, WP Docket No. 07-100, *Eighth Report and Order*, FCC 24-114, at para. 6 (rel. Oct. 22, 2024) ("Eighth R&O").

Specifically, and as discussed further below, APCO requests that the Commission update the Part 90 power limits and out-of-band emissions ("OOBE") limits to more closely align with the Part 27 rules that have proven effective at facilitating nationwide mobile broadband network deployment.

While APCO appreciates the steps the Commission has taken to revitalize the 4.9 GHz band, more work is left to be done, and time is of the essence. To achieve its intent to promote innovation in the 4.9 GHz band, the Commission should ensure that the technical rules for the 4.9 GHz band align with the standards in the global marketplace. To promote robust 5G deployments nationwide, the rule changes proposed herein are needed by June 2025 so that the 4.9 GHz band can be incorporated into the 3rd Generation Partnership Project's ("3GPP") next release—3GPP Rel. 19, which is expected in September 2025. As explained below, if the 4.9 GHz band is not addressed by 3GPP Rel. 19, 5G deployments may be significantly delayed, well into 2028, frustrating the Commission's overarching goal of providing public safety users with access to innovative technologies in the near-term.

I. Updating the 4.9 GHz Band Technical Rules Serves the Public Interest.

Revising the technical rules as set forth herein will serve the public interest by "incentivizing the use of the latest commercially available technologies, including 5G."[4] As the record in this proceeding demonstrates, the 4.9 GHz band presents a unique opportunity to integrate the latest commercial technologies, including 5G, for the benefit of public safety.[5]

[4] 47 C.F.R. § 90.1217(b).

[5] *See, e.g.,* Comments of NPSTC, WP Docket No. 07-100, at 16-17 (Nov. 29, 2021); Comments of IACP, WP Docket No. 07-100, at 4 (Nov. 29, 2021) (stating that the 4.9 GHz is best suited for 5G deployment and aligns with the ability to pass public presented 5G data to first responders in the field); Comments of the Public Safety Spectrum Alliance, WP Docket No. 07-100, at 7 (Nov. 29, 2021) (stating that the 4.9 GHz band presents "the best and, possibly, the only opportunity to deploy 5G services to public safety agencies utilizing the low-latency, high-throughput, and desirable propagation characteristics associated with mid-band spectrum."); Reply Comments of IAFC, WP Docket No. 07-100, at 4-5 (Dec. 20, 2021) (stating that "IAFC agrees with NPSTC that it is enthusiastic

Given the significant benefits of 5G to public safety, the Commission should adopt the technical rules necessary to promote such deployments in the band as broadly as possible. In particular, the Commission should adjust the current Part 90 rules regarding power and emission limits to accommodate the requirements of 5G deployments.[6] Updating the Part 90 technical rules follows from and aligns with the Commission's decision to "facilitate the integration of the latest commercially available technologies, including 5G, for the benefit of public safety users."[7]

Time is of the essence to satisfy the Commission's goal to "ensure that the 4.9 GHz band is put to more robust use nationwide in the near term."[8] Swift adoption of the proposed Part 90 technical rule revisions will be a necessary first step for near-term 5G deployment by serving as foundational input for 3GPP standards development for base stations, user equipment, and OOBE in the 4.9 GHz band. To accommodate 5G deployments in the band by 2027, the Commission should propose 5G-friendly changes to the technical rules by March 2025 so that a 4.9 GHz work item can be considered and approved at the upcoming 3GPP radio access network ("RAN") plenary. In addition, the Commission should adopt final rules by June 2025 to ensure standards can be developed in the lead up to the 3GPP Rel. 19 in September 2025. Acting under this timeframe will enable developers to design and manufacture devices to be deployed for 5G use in the revitalized 4.9 GHz band ecosystem, thus enabling public safety users to take advantage of the advanced technologies available in the commercial marketplace.

Given that a delay in any of these steps will delay 5G rollout in the 4.9 GHz band, rapid adoption of the proposed Part 90 technical rule updates serves the public interest. Indeed, based

about the potential use of 5G technology to serve public safety needs and agrees with PSSA that 4.9 GHz band is well-suited for emerging technologies, including 5G").

[6] *See*, *e.g.*, 47 C.F.R. § 90.1215; *cf.* Attachment A.

[7] Eighth R&O at para. 1.

[8] *Id.*

on typical timelines for standards work, failing to revise the technical rules by June 2025 is likely to result in at least a 12-to-18-month delay in mobile broadband network deployment efforts, meaning 5G deployments in the band would likely be pushed beyond 2028.

II. The Proposed Technical Rule Changes Would Support 5G Technology and Beyond in the 4.9 GHz Band.

Since its allocation to public safety in 2000, public safety's use of the 4.9 GHz band has been hindered due to the lack of coordination of the band as well as the lack of a diverse device ecosystem. Introducing 5G-supported Part 27 rules is in public safety's best interest because it will enable implementation guidelines and power limits that support the introduction of cost effective, high performing base and mobile/portable hardware that public safety can leverage. For too long, public safety's use of the 4.9 GHz band has been absent a global commercial device ecosystem capable of providing public safety the tools it needs to complete its mission. Th proposed rule changes would support new opportunities for public safety use cases in the band.

In addition to the near-term use of 5G and subsequent generations of cellular technological evolutions that the band can support, APCO believes that incorporating the 4.9 GHz band in the 3GPP Release 19 standard, including the Part 27 rules provided herein, will also assist incumbent use of the band in their device selection resulting in improved system performance. Including the 4.9 GHz band in global standards will be an important step in improving public safety's overall use and effectiveness of the band, while still supporting the diverse use public safety use cases and technologies currently utilized in the band.

As set forth on Attachment A, APCO proposes several changes to the Part 90 rules to more effectively and efficiently permit nationwide mobile broadband network deployments in

the 4.9 GHz band, while preserving current incumbent uses. The proposed revisions include changes to the maximum on-channel radiated power, the maximum conducted power OOBE, and the maximum power flux density ("PFD") limits at the service area boundary. As explained below, the proposed technical rules are akin to Part 27's 5G-friendly technical rules. The Commission has repeatedly endorsed Part 27's technical rules for promoting the deployment of mobile broadband networks and 5G services and should do so here.[9]

A. Maximum EIRP Limits for Base and Mobile Stations in the 4940-4990 MHz Band

APCO proposes to adopt the same base station and mobile station equivalent isotropically radiated power ("EIRP") limits as implemented in Part 27.50(j) of the Commission's rules. Specifically, the base station maximum EIRP in the 4.9 GHz band is requested to be 3280 Watts/MHz. This base station EIRP limit applies to aggregate power of all antenna elements in a given base station sector.

Furthermore, mobile and portable stations in the band should be limited to 2 Watts EIRP and be able to operate in a way that minimizes power to the extent needed for successful communications. The proposed 2 Watts EIRP limit is necessary to enhance the reverse link performance consistent with the inherently higher propagation losses in the 4.9 GHz band.

B. Maximum Conducted Power for Emissions Outside the Authorized Bandwidth

Similar to the above EIRP limits found in Part 27, APCO proposes implementing the base station and mobile station conducted power OOBE limits as detailed in Section 27.53(l) of

[9] *See, e.g.*, 47 C.F.R. §§ 27.50, 27.53, 27.55; *see generally* Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122, *Report and Order and Order of Proposed Modification*, 35 FCC Rcd 2343 (2020); Facilitating Shared Use in the 3100-3550 MHz Band, WT Docket No. 19-348, *Second Report and Order, Order on Reconsideration, and Order Proposing Modification,* 36 FCC Rcd 5987 (2021).

the Commission's rules. The Part 27 rules related to how these emissions limits are measured should also be maintained, the details of which are provided in Attachment A.

Base stations in the 4.9 GHz band should be limited to maximum conducted output power of emissions outside the licensee's authorized bandwidth of -13 dBm/MHz.

Similarly, mobile stations in the 4.9 GHz band should have the maximum conducted output power of their emissions outside the licensee's authorized bandwidth be limited to -13 dBm/MHz.

C. Maximum PFD at the Border of the Licensee's Service Area

To limit co-frequency interference to adjacent licensees, APCO proposes to adopt the same PFD limits in Section 27.55(d). That rule, as applied to the 4.9 GHz band, would limit the PFD at any location on the border of a licensee's service area to -76 dBm/m^2/MHz, measured at 1.5 meters above ground. Licensees in adjacent areas may voluntarily agree to operate under higher PFD values at their common boundary.

III. Conclusion

The Commission's Band Manager framework for the 4.9 GHz band serves as a crucial first step to promote innovation and incentivize the use of advanced technologies for public safety users across the country. Swift adoption of complementary revisions to the Part 90 technical rules as proposed herein will ensure advanced technologies can be deployed in the band in the near term and serve the public interest.

Respectfully submitted,
APCO INTERNATIONAL

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ATTACHMENT A: PROPOSED RULE CHANGES

§ 90.1215 Emission and Power limits.

Except as provided in paragraphs (f), (g), (h), and (i) of this section, The transmitting power of stations operating in the 4940-4990 MHz band must not exceed the maximum limits in this section.

(a)

(1) For base, mobile, and temporary fixed operations, the maximum conducted output power must not exceed:

TABLE 1 TO PARAGRAPH (a)(1)

Channel bandwidth (MHz)	Low power maximum conducted output power (dBm)	High power maximum conducted output power (dBm)
1	7	20
5	14	27
10	17	30
15	18.8	31.8
20	20	33
30	21.8	34.8
40	23	36
50	24	37

(2) High power devices are also limited to a peak power spectral density of 21 dBm per one MHz. High power devices using channel bandwidths other than those listed above are permitted; however, they are limited to peak power spectrum density of 21 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the maximum conducted output power and the peak power spectrum density should be reduced by the amount in decibels that the directional

gain of the antenna exceeds 9 dBi. However, high power point-to-point and point-to-multipoint operations (both fixed and temporary-fixed rapid deployment) may employ transmitting antennas with directional gain up to 26 dBi without any corresponding reduction in the maximum conducted power or spectrum density. Corresponding reduction in the maximum conducted output power and peak power spectrum density should be the amount in decibels that the directional gain of the antenna exceeds 26 dBi.

(b) Low power devices are also limited to a peak power spectral density of 8 dBm per one MHz. Low power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 8 dBm/MHz. If transmitting antennas of directional gain greater than 9 dBi are used, both the maximum conducted output power and the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9 dBi.

(c) The maximum conducted output power is measured as a conducted emission over any interval of continuous transmission using instrumentation calibrated in terms of an RMS-equivalent voltage. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true maximum conducted power measurement conforming to the definitions in this paragraph for the emission in question.

(d) The peak power spectral density is measured as conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of one MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

(e) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power shall not exceed13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

(f) The transmitting power of permanent fixed point-to-point and point-to-multipoint stations operating in the 4940-4990 MHz band must not exceed the maximum limits in this paragraph (f). Moreover, applicants should request no more power than necessary for a particular use.

(1) The maximum equivalent isotropically radiated power (EIRP), as referenced to an isotropic radiator, must not exceed 55 dBW (85 dBm).

(2) For path lengths shorter than 17 kilometers, the EIRP shall not exceed the value derived from the following equation: New EIRP limit = 55 dBW—40*log(17/B) dBW, where B = the actual path length in kilometers.

(g) For 5G (and subsequent generations of cellular network technology) base station operations in the 4940-4990 MHz band, the maximum conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (g) is based on the use of measurement instrumentations employing a resolution bandwidth of 1 MHz or greater. However, in the 1-megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(1) For mobile operations in the 4940-4990 MHz band, the maximum conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (g)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(h) The transmitting power of each fixed, base, or mobile and portable stations operating in the 4940-4990 MHz band must not exceed the maximum limits in this paragraph (h). Moreover, applicants should request no more power than necessary for a particular use.

(1) The power of each fixed or base station transmitting in the 4940-4990 MHz band is limited to an equivalent isotropically radiated power (EIRP) of 3280 watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.

(2) Mobile and portable stations are limited to 2-watt EIRP in the 4940-4990 MHz band. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(i) The power flux density (PFD) at any location on the border of a licensee's service area ratio of the peak excursion of the modulation envelope (measured using a peak hold

function) to the maximum conducted output power shall not exceed −76 dBm/m^2/MHz 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less. This power flux density will be measured at 1.5 meters above ground. Licensees in adjacent areas may voluntarily agree to operate under a higher PFD at their common boundary.