OET Grants Wi-Fi Alliance Request for Waiver
Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Wi-Fi Alliance	)	ET Docket No. 23-107
	)	
Request for Waiver of Section 15.407(l)(2) of the Commission's Rules for AFC System Operation in the 6 GHz Band	)	

ORDER

Adopted: December 5, 2024 **Released: December 5, 2024**

By the Acting Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. By this Order, we grant a waiver of section 15.407(l)(1)[1] of the Commission's rules to permit automated frequency coordination (AFC) systems in the 5.925-6.425 GHz and 6.525-6.875 GHz frequency bands to account for building entry loss when determining permitted frequencies and power levels for composite low-power indoor (LPI)/standard-power unlicensed access points. We find that grant of the waiver will serve the public interest by increasing the utility of 6 GHz unlicensed devices without increasing the potential for these devices to cause harmful interference to licensed services which share the spectrum.

II. BACKGROUND

2. On April 23, 2020, the Commission adopted a Report and Order and Further Notice of Proposed Rulemaking (*6 GHz Report and Order*) that expanded unlicensed operations in the 6 GHz band (5.925-7.125 GHz).[2] The *6 GHz Report and Order* adopted rules for two categories of unlicensed operations—standard-power operations and low-power indoor (LPI) operations.[3] Standard-power access points and fixed client devices are limited to two portions of the 6 GHz band—the U-NII-5 band (5.925-6.425 GHz) and the U-NII-7 band (6.525-6.875 GHz) and are required to operate under the control of an AFC system.[4] The U-NII-5 and U-NII-7 bands are also used by licensed fixed and temporary-fixed point-to point microwave systems.[5] In addition, the 6.65-6.6752 GHz portion of the U-NII-7 band is used for

[1] 47 CFR § 15.407(l)(1).

[2] *Unlicensed Use of the 6 GHz Band*, ET Docket No. 18-295, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852 (2020) (*6 GHz Report and Order*).

[3] *6 GHz Report and Order*, 35 FCC Rcd at 3860, paras. 17-18

[4] 47 CFR §§ 15.403, 15.407(k)(1); *6 GHz Report and Order*, 35 FCC Rcd at 3860, 3862, 3923, paras. 17-18, 22, 192. Only standard-power and fixed-client 6 GHz unlicensed devices are required to operate pursuant to an AFC system. 47 CFR § 15.407(k)(1). Standard-power devices may operate both outdoors and indoors at power levels above the low-power indoor device power limits. *Id*. § 15.407(a)(4). A fixed client device is "intended as customer premise equipment that is permanently attached to a structure, operates only on channels provided by an AFC, has a geolocation capability, and complies with antenna pointing angle requirements." *Id*. § 15.403.

[5] *6 GHz Report and Order*, 35 FCC Rcd at 3855, para. 7.

radio astronomy observations at a limited number of observatories.[6] The AFC systems manage spectrum access for standard-power access points and fixed client devices to prevent harmful interference from occurring to fixed microwave systems and certain radio astronomy observatories. The *6 GHz Report and Order* also allowed unlicensed LPI access points to operate over the entire 6 GHz band without being under the control of an AFC system.[7] To prevent harmful interference from occurring, LPI access points operate at lower power than standard-power access points and are restricted to indoor operation. To ensure LPI access points operate only indoors, the access point must adhere to a set of Product Form Factor (PFF) requirements: LPI access points cannot be weather resistant, cannot operate on battery power, must have integrated antennas, and must have a label restricting the device to indoor use only.[8] Client devices may communicate with either standard-power or LPI access points and are restricted to 6 dB less power than the access point with which they are communicating.[9] Table 1 summarizes the permitted power levels for the standard-power and LPI access points as well as the associated client devices. Access points can be authorized to operate in both LPI and standard power modes – i.e., composite LPI/standard-power access points.[10] These access points must comply with the PFF rules set forth for LPI access points to prevent outdoor operation.[11] Composite LPI/standard-power access points can operate in standard power mode at the higher power levels permitted for standard-power access points when under the control of an AFC system, but are only permitted to operate indoors. When they are not operating under the control of an AFC system, they are limited to the LPI power level.

[6] *Id*. at 3884, para. 87.

[7] *6 GHz Report and Order*, 35 FCC Rcd at 3860, para. 18.

[8] 47 CFR §§ 15.403, 15.407(d)(4); *6 GHz Report and Order,* 35 FCC Rcd at 3891, para. 107; *Part 15 Subpart E U-NII 6 GHz: General Guidance Bands 5, 6,7, 8*, Office of Engineering and Technology Laboratory Division, Federal Communications Commission, KDB 987594 D01 v02 at 14 (Aug. 9, 2023), https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=277034.

[9] 47 CFR § 15.407(a)(4)-(8); *6 GHz Report and Order*, 35 FCC Rcd at 3922, para. 189.

[10] Composite devices are those subject to certification under multiple parts of the Commission's rules. 47 CFR § 2.1033(e).

[11] *Part 15 Subpart E U-NII 6 GHz: General Guidance Bands 5, 6, 7, 8*, FCC Office of Engineering and Technology Laboratory Division Knowledge Database (KDB) publication, KDB 987594 D01 v02 at 14 (Aug. 9, 2023), https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=277034.

Table 1: 6 GHz Band Standard-power and LPI Devices

Device Class	Operating Bands	Maximum EIRP	Maximum EIRP Power Spectral Density
Standard-Power Access Point (AFC Controlled)	U-NII-5 (5.925-6.425 GHz) U-NII-7 (6.525-6.875 GHz)	36 dBm	23 dBm/MHz
Client Connected to Standard-Power Access Point		30 dBm	17 dBm/MHz
Low-Power Access Point (indoor only)	U-NII-5 (5.925-6.425 GHz) U-NII-6 (6.425-6.525 GHz) U-NII-7 (6.525-6.875 GHz) U-NII-8 (6.875-7.125 GHz)	30 dBm	5 dBm/MHz
Client Connected to Low-Power Access Point		24 dBm	-1 dBm/MHz

3. Section 15.407(l) of the Commission's rules defines the predictive propagation models and interference protection criteria that an AFC system must use to protect microwave receivers.[12] AFC systems are required to use the designated propagation models to protect microwave receivers based on the -6 dB I/N interference protection criteria adopted in the *6 GHz Report and Order* for protecting microwave receivers.[13] The existing rules do not permit AFC systems to incorporate building entry losses (BEL) into their algorithm for determining permissible standard power device operating channels and power levels. The Office of Engineering and Technology, however, has noted that if AFC operators developed technology or had unique circumstances, the Commission may consider waiver requests to allow AFC operations to account for BEL.[14]

4. On February 17, 2023, Wi-Fi Alliance filed a request seeking waiver of section 15.407(l)(2) of the Commission's rules to allow its AFC system to incorporate BEL when assessing allowable channel availability and power constraints for access points that are authorized to operate in both standard power and LPI modes — i.e., composite LPI/standard-power access points.[15] In its waiver request, Wi-Fi Alliance notes that, based on FCC ID and equipment class, its AFC system can determine that a device is a composite LPI/standard-power device and, because composite devices may operate only indoors, thus confirm that it is operating indoors.[16] On March 22, 2023, Broadcom Inc. filed an identical request for waiver of section 15.407(l)(2) of the Commission's rules to allow it to incorporate, based on the same principle as Wi-Fi Alliance's, BEL into its AFC system propagation models for composite LPI/standard-power devices.[17] On April 7, 2023, Qualcomm and Federated Wireless also filed a similar joint waiver request seeking waiver to include BEL into their AFC systems' predictive propagation model

[12] 47 CFR § 15.407(l).

[13] 47 CFR § 15.407(l)(2); *6 GHz Report and Ord*er, 35 FCC Rcd at 3878-79, paras. 70-71.

[14] *OET Announces Conditional Approval for 6 GHz Band Automated Frequency Coordination Systems,* Public Notice, DA 22-1146, 37 FCC Rcd 13071, 13089. para. 40 (OET 2022) (*AFC Approval Public Notice*).

[15] *Request by Wi-Fi Alliance for Waiver of Section 15.407(l)(2) of the Commission's Rules* (Wi-Fi Alliance Waiver Request), ET Docket No. 23-107 (filed Feb. 17, 2023). Wi-Fi Alliance refers to access points that operate in both standard-power and LPI modes as "composite *Indoor Only With AFC With Restriction* devices." *Id.* at 2 (emphasis in original).

[16] Wi-Fi Alliance Waiver Request at 4.

[17] *Broadcom Waiver Request* (Broadcom Waiver Request), ET Docket No. 23-107 (filed Mar. 22, 2023).

under section 15.407(l)(1) instead of section 15.407(l)(2).[18] On January 22, 2024, Sony filed a waiver request seeking waiver of section 15.407(l)(1). Sony's waiver request provides further detail on how its AFC system can identify standard-power indoor composite devices based on its FCC ID.[19] All four waiver requests highlight that the respective AFC systems are capable of accounting for BEL when assigning channels to standard-power composite devices.[20]

5. The Office of Engineering and Technology (OET) issued a Public Notice soliciting comments on the *Wi-Fi Alliance Request* on March 21, 2023.[21] Twelve parties filed comments and five parties filed replies.[22] While several parties supported Wi-Fi Alliance's waiver request, other commenters sought additional information from Wi-Fi Alliance on how its AFC system will ensure that composite devices would only operate indoors and protect fixed microwave incumbents from harmful interference.[23]

III. DISCUSSION

6. We are authorized to grant a waiver under section 1.3 of the Commission's rules if the petitioner demonstrates good cause for such action.[24] Good cause may be found and a waiver granted "where particular facts would make strict compliance inconsistent with the public interest."[25] When examining a request for waiver of the Commission's rules, we undertake a two-part analysis. A waiver of the Commission's rules is appropriate when (1) "special circumstances warrant a deviation from the general rule"; and (2) "such deviation will serve the public interest."[26] To satisfy this public interest requirement, there must be a stronger public interest benefit in granting the waiver than in applying the rule. We may find this to be the case when grant of a waiver would not undermine the purpose of the rule.[27]

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[18] *Qualcomm and Federated Wireless Waiver Request* (Qualcomm and Federated Wireless Waiver Request), ET Docket No. 21-352 (filed Apr. 7, 2023).

[19] *Sony Waiver Request* (Sony Waiver Request), ET Docket No. 23-107 (filed Jan. 22, 2024).

[20] Wi-Fi Alliance Waiver Request at 2, Broadcom Waiver Request at 5, Qualcomm and Federated Wireless Waiver Request at 2-3, and Sony Waiver Request at 2.

[21] *OET Seeks Comment on Wi-Fi Alliance Request for Waiver of Section 15.407(l)(2)*, ET Docket No. 23-107, Public Notice, DA 23-239 (2023).

[22] NCTA - The Internet & Television Association; Hewlett Packard Enterprise (HPE); Dynamic Spectrum Alliance (DSA); AT&T Services, Inc.; Broadcom Inc.; Federated Wireless, Inc.; Cisco Systems, Inc.; Utilities Technology Council (UTC); Public Interest Spectrum Coalition; Southern Company Services, Inc.; Association of Public-Safety Communications Officials (APCO) International, Inc.; National Wireless Communications Council (NWCC); Wi-Fi Alliance (WFA); Joint filing of Broadcom Inc., Cisco Systems, Inc., Hewlett Packard Enterprise, Federated Wireless Inc., and Qualcomm Incorporated; Joint filing of Broadcom Inc., Cisco Systems, Inc., Google LLC, Hewlett Packard Enterprise, Intel Corporation, Microsoft Corporation, and Qualcomm Incorporated.

[23] *See generally* AT&T Comments; UTC Comments; Southern Company Services, Inc. Comments; APCO Comments; NWCC Reply.

[24] 47 CFR § 1.3. *See AT&T Corp. v. FCC*, 448 F.3d 426, 433 (D.C. Cir. 2006); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

[25] *Ne. Cellular Tel. Co. v. FCC,* 897 F.2d 1164, 1166 (D.C. Cir. 1990); *see also ICO Global Communications (Holdings) Limited v. FCC*, 428 F.3d 264, 269 (quoting *Northeast Cellular*); *WAIT Radio*, 418 F.2d at 1157-59.

[26] *Northeast Cellular*, 897 F.2d at 1166; *see also ICO Global Communications*, 428 F.3d at 269 (quoting *Northeast Cellular*); *WAIT Radio*, 418 F.2d at 1157-59.

[27] *See, e.g., WAIT Radio*, 418 F.2d at 1157 (stating that even though the overall objectives of a general rule have been adjudged to be in the public interest, it is possible that application of the rule to a specific case may not serve the public interest if an applicant's proposal does not undermine the public interest policy served by the rule); *Northeast Cellular*, 897 F.2d at 1166 (stating that in granting a waiver, an agency must explain why deviation from the general rule better serves the public interest than would strict adherence to the rule).

7. We now have four requests for a waiver of section 15.407(l)(1) or (2) of the Commission's rules to permit an AFC system's predictive propagation model to take BEL into account for specific standard-power devices that are designed to operate only indoors. We first consider whether special circumstances are presented that warrant deviating from the rule that precludes AFC systems operating in the 6 GHz band from using BEL. For the reasons discussed below, we find such circumstances, as narrowed by the conditions we impose herein, to be present.

8. When OET first granted conditional approval of thirteen entities to operate AFC systems, we recognized the location determining technologies that AFCs could employ were still in development.[28] As evidenced by the waiver requests before us, the formerly nascent technology has advanced. In adopting rules for the 6 GHz band, the Commission created two device categories: standard-power operations and low-power indoor (LPI) operations.[29] Devices that are a composite of the two categories are permissible, but must meet both categories' requirements, including the form factors for low-power indoor devices, thereby restricting operations only to indoors.[30] The technological advancement, which is shown by strong support in the record, creates a special circumstance for device operations. Several parties reiterate the benefits tied to providing the requested waiver relief. The Internet and Television Association NCTA explains that composite devices designed for indoor-only use will allow consumers and businesses to experience the benefits of enhanced 6 GHz coverage, throughput, and speed.[31] NCTA also emphasizes the significance of accounting for radio frequency signal attenuation when it travels through building walls, underscoring the importance of factoring BEL into AFC system calculations when assessing spectrum availability for indoor-only operations.[32] Similarly, Federated Wireless states that waiver relief would improve coverage and throughput to the benefits of both consumers and enterprises.[33] Further, Broadcom highlights that including BEL in AFC system calculations ensures indoor-only access points are not needlessly constrained to much lower power or channel availability than is necessary to keep the signal received from the access point from exceeding the conservative -6 dB I/N interference protection criterion for standard power operations.[34] Dynamic Spectrum Alliance (DSA) notes that indoor-only composite devices can help satisfy the growing demand for affordable and enhanced broadband access by allowing efficient unlicensed use of the 6 GHz band.[35]

9. Additionally, regarding special circumstances supporting the waiver request, we note that we are requiring AFC systems to be capable of distinguishing between indoor composite LPI/standard-power access points and stand-alone standard power access points based on the FCC ID and certified equipment class information. This function is supported through a request by the AFC to the Commission's Equipment Authorization System. Only upon confirmation that a device is certified as an

[28] AFC Approval Public Notice at para 40. ("Given the developmental state of these location determining technologies…we take no position at this time whether to permit the AFC to account for building entry loss for indoor standard-power devices. We will continue to monitor how these technologies mature . . . .").

[29] *6 GHz Report and Order*, 35 FCC Rcd at 3860, paras. 17-18.

[30] *See Part 15 Subpart E U-NII 6 GHz General Guidance Bands 5, 6, 7, 8*, FCC Office of Engineering and Technology Laboratory Division Publications, Knowledge Database at 10, Table 4, Composite Equipment Class Product 3 "Indoor Only With AFC With Restriction" (May 20, 2022), *available at* https://apps.fcc.gov/kdb/GetAttachment.html?id=4iuZjuFgWiNypCLVpSN3cQ%3D%3D&desc=987594%20D01%20U-NII%206GHz%20General%20Requirements%20v01r03&tracking_number=277034 (last visited Oct. 7, 2024).

[31] NCTA Comments at 3.

[32] NCTA Comments at 3-4.

[33] Federated Wireless Comments at 2-3.

[34] Broadcom Comments at 4.

[35] DSA Comments at 3.

indoor composite LPI/standard-power device can the AFC assume no more than 6 dB of BEL when it provides channel and power level information to that device. This will keep the harmful interference risk commensurate with the insignificant risk already determined by the Commission for 6 GHz unlicensed devices.

10. Some parties oppose Wi-Fi Alliance's waiver request, arguing that operation of an indoor composite LPI/standard-power device does not necessarily constrain devices to operating only indoors. Commenters such as National Wireless Communications Council (NWCC), Utilities Technology Council (UTC), Southern Company Services, AT&T,the Association of Public-Safety Communications Officials (APCO), and the Fixed Wireless Communications Coalition (FWCC) all question how Wi-Fi Alliance can provide assurance that standard power client and composite LPI/standard-power devices will be constrained to operate indoors.[36] In response, Wi-Fi Alliance explains that its AFC system will verify the nature of the standard-power access point using its corresponding FCC ID and certified Equipment Class information and that standard-power access points that comply with the PFF rules set forth for LPI access points are composite LPI/standard-power devices, which by nature are constrained to indoor operation.[37] As Hewlett Packard Enterprise (HPE) explains, composite LPI/standard-power devices are "inherently indoors, given that they fully comply with all of the Product Form Factor ("PFF") requirements of LPI devices."[38] A device's FCC ID can be used to verify that it has been approved for both standard-power and LPI operation; when that FCC ID is transmitted to an AFC, the AFC can conclude "that the device is a Composite LPI + SP device."[39] Broadcom also points out that Wi-Fi Alliance's waiver is "limited to a category of [access points] for which the Commission's rules already require indoor-only operation."[40]

11. We find that the technological developments since the *6 GHz Report and Order* and the specifics of this category of devices—indoor composite LPI/standard-power devices—are sufficiently special circumstances to meet the first prong of our waiver standard. Having determined that special circumstances warrant deviating from the general rule, we next consider the second element of analysis – whether such deviation serves the public interest. For the reasons below, we find the requested waivers will provide significant public benefits while fulfilling the purpose of the rules.

12. Several commenters including AT&T, UTC, Southern Company Services, APCO, and NWCC raise harmful interference concerns. For example, UTC claims taking BEL into consideration poses a risk because there is a "mountain of evidence that LPI devices are certain to cause interference."[41] In response to UTC's claim, NCTA points out that there is insufficient credible evidence present in the record that corroborates any significant harmful interference associated with LPI operations.[42] Another commenter, APCO, questions how public safety communications will be protected from harmful interference.[43] Southern Company presents a similar argument stating that Wi-Fi Alliance's waiver request lacks "any technical detail on how incumbent operations will be protected from harmful interference."[44] Southern Company suggests that granting the wavier should not be considered until real-world data is gathered and presented that demonstrates the AFC systems actually protect incumbents and

[36] *See generally* AT&T Comments; UTC Comments at 3; Southern Company Services, Inc. Comments at 4-6; APCO Comments; NWCC Reply at 4, FWCC Nov, 12, 2024 *Ex Parte* at 1-2.

[37] WFA Reply at 11 ("[T]he FCC has already identified regulatory constraints to ensure that LPI devices operate only indoors, and composite devices will be subject to exactly the same constraints.").

[38] HPE Comments at 2.

[39] HPE Comments at 4.

[40] Broadcom Inc. Comments at 2-3.

[41] UTC Comments at 6.

[42] NCTA Comments at 8.

[43] APCO Comments at 3.

[44] Southern Company Comments at 2.

specify which measured BEL values should be applied by the AFC systems.[45] In response, Wi-Fi Alliance clarifies that its AFC system will follow the parameters set forth by the Commission for protecting microwave systems including the -6 dB I/N interference protection criterion.[46] Wi-Fi Alliance points out that Southern Company's arguments are mostly founded on assertions that the Commission previously considered and dismissed in the *6 GHz Report and Order*.[47]

13. AT&T's opposition to the waiver request is mainly centered on the assertion that standard-power client devices operating outdoors will pose a high risk of harmful interference when communicating with composite LPI/standard-power access points.[48] AT&T points out that because composite LPI/standard-power access points can operate at higher power than LPI access points, they will provide substantial outdoor coverage and it would be reasonable to expect users of client devices to take advantage of this outdoor coverage.[49] AT&T argues that "[standard-power] clients operate at substantially higher power than LPI devices, do not incorporate PFF requirements guaranteeing indoor-only operation, and thus pose a significant interference threat to primary FS microwave incumbents."[50] In response to AT&T's concerns, Wi-Fi Alliance explains the low probability of harmful interference arising from client devices connected to indoor composite access points.[51] Wi-Fi Alliance asserts that for interference to occur, the device must first be an outdoor standard power client device that is connected to an indoor composite LPI/standard-power access point and must also be in the beam of the microwave receiver.[52] Furthermore, Wi-Fi Alliance points out that there must be a frequency overlap between the outdoor standard power client channel and microwave network channel. Wi-Fi Alliance concludes that "the alignment of all these events and circumstances is highly unlikely, representing an extreme corner case."[53] NCTA concurs with Wi-Fi Alliance's explanation, stating that AT&T is incorrect in concluding that standard-power client devices operating outdoors while connected to indoor-only composite LPI/standard-power access points would pose an impermissibly high risk of harmful interference to 6 GHz incumbent operations.[54]

14. We find that it is in the public interest to grant a waiver to enable the AFC systems to consider BEL for composite LPI/standard-power access points. Allowing the AFC systems to consider BEL when determining channel availability will increase the operating power of the composite LPI/standard-power access points when appropriate, thereby increasing their utility to consumers. The greater operating power will enable the access points to provide increased indoor coverage and/or provide higher data rates. This will expand the use of the 6 GHz band, thereby furthering the Commission's goal of encouraging more efficient spectrum use. In granting these waiver requests, we are adopting conditions that will prevent the composite LPI/standard-power access points from presenting an increased risk of causing harmful interference to microwave receivers as compared to stand-alone standard-power

[45] *Id*. at 4.

[46] WFA Reply Comments at 9.

[47] WFA Reply Comments at 6-7 (citing *6 GHz Report and Order,* 35 FCC Rcd at 3873-81, 3891-92, 3894-95, paras. 60-77, 109, 117-118).

[48] AT&T Comments at 5-8. FWCC makes a similar argument regarding client devices operating outdoors. FWCC Nov, 12, 2024 *Ex Parte* at 2-3.

[49] *Id*. at 4-5. {{3-4?}}

[50] AT&T Comments at 3.

[51] WFA Reply Comments at 14-16.

[52] WFA Reply Comments at 15.

[53] WFA Reply Comments at 16.

[54] NCTA Reply Comments at 9.

access points. Hence, the purpose of the rule, which is to prevent harmful interference from occurring to microwave receivers which share the 6 GHz band, will not be undermined by granting the waiver.

15. Whether granting the waiver request will result in an increase in the likelihood of harmful interference occurring to microwave receivers in the 6 GHz band depends on the amount of attenuation that the AFC systems are allowed to assume for BEL in their calculations. None of the parties requesting waivers or the commenters have suggested a specific value for this assumed attenuation. We shall limit the BEL that the AFC systems may use in their calculations such that the risk of harmful interference occurring is not increased compared to operation under the Commission's current rules. Based on the record before us, the greatest risk of harmful interference occurring if the AFC systems use BEL is in the situation AT&T raises, where a client device is operating outdoors, communicating with an indoor composite LPI/standard-power access points that is operating in standard power mode, and a frequency overlap exists between the channel on which the client device is operating and a nearby microwave receiver. Consequently, if we limit the power levels and operating frequencies of such a client device to those permitted for standard power access points under the current rules, we will not increase the risk that harmful interference will occur to microwave receivers. Client devices are limited to 6 dB less power than the access point to which they are connected and only transmit on the frequency on which the access point to which they are connected operates.[55] Therefore, permitting the AFC systems to assume 6 dB of BEL for indoor composite LPI/standard-power access points would limit connected client device power levels and operating frequencies to those currently permitted for standard power access points under the current rules.[56] This will ensure that outdoor client devices that connect to an indoor composite LPI/standard-power access point operating in standard power mode would never operate at a power level greater than what the AFC system would permit for an outdoor standard-power access point at that location. Because the Commission concluded in the *6 GHz Report and Order* that the rules adopted for standard-power operations under the control of an AFC system would protect incumbent fixed microwave operations, we find that permitting the AFC systems to assume a BEL of up to 6 dB for composite LPI/standard-power access points will protect fixed microwave systems from harmful interference.[57]

16. We find unconvincing other interference concerns raised by commenters. UTC's claim that there is evidence that LPI devices cause interference are irrelevant to considering these waiver requests because the composite LPI/standard-power access points will be operating under the control of an AFC system when operating at power levels greater than those permitted by LPI access points. The Commission has received no evidence that AFC controlled access points have caused harmful interference. We also see no reason to wait until data on the effectiveness of the AFC systems or that specifies which measured BEL values should be applied is presented before granting the waivers, as Southern Company suggests.[58] No commenter suggests a credible reason to doubt the effectiveness of the AFC systems in preventing harmful interference from standard-power access points and their associated clients. As we note above, the 6 dB allowance for BEL we are permitting for the AFC systems is based on the conclusions the Commission reached in the *6 GHz Report and Order* to support adoption of our current rules. It is therefore unnecessary to require the parties requesting the waiver to provide BEL measurements before we grant this waiver. As to APCO's concerns regarding protecting public safety operations,[59] the Commission noted that there is no appreciable difference between microwave systems

[55] 47 CFR § 15.407(d)(4)-(8); *6 GHz Report and Order*, 35 FCC Rcd at 3922, para. 189.

[56] We note that the 6 dB we permit here is based on the AFC system calculation for permissible power on any given frequency given that a standard power client device is assumed to operate outdoors and not necessarily benefit from the additional 20.5 dB of BEL the Commission assumed when determining the permitted power levels for LPI devices. *6 GHz Report and Order*, 35 FCC Rcd at 3895, 3933, n.297, para. 218.

[57] *6 GHz Report and Order*, 35 FCC Rcd at 3862, para. 22.

[58] Southern Company Comments at 4.

[59] APCO Comments at 3.

operated by public safety organizations and other microwave systems.[60] Because granting this waiver will not result in an increased risk of harmful interference to microwave systems there correspondingly will not be an increased risk to public safety operations.

17. The Commission's rules require that standard-power access points provide their FCC identification number when registering with an AFC system.[61] As a condition of this waiver we are requiring that the AFC system verify that a composite LPI/standard-power access point is of the correct certified equipment class based on the provided FCC identification number. Devices of this equipment class are restricted to indoor operations and must meet the PFF requirements for LPI devices. These PFF requirements are designed to prevent these devices from operating outdoors. The concerns that commenters have raised that the composite LPI/standard-power access points will not be constrained to indoor operation mirror the concerns the Commission rejected in the *6 GHz Report and Order* that LPI devices would not stay indoors.[62] In the *6 GHz Report and Order*, the Commission referred to the PFF requirements as "reasonable and practical measures that will restrict low-power access points to indoor operations."[63] As the Commission found in the *6 GHz Report and Order*, we conclude that these same PFF requirements will restrict composite LPI/standard-power access points to indoor operation.

18. The AFC operators requesting we waive our rules to permit AFC systems to take into account BEL request we waive either section 15.407(1)(1) or 15.407(l)(2) of our rules.[64] We believe 15.407(l)(1) is the correct rule section to consider as it defines the propagation models to be used by the AFC systems, while 15.407(1)(2) specifies the -6 dB I/N ratio as the interference protection criteria.[65] This waiver should be viewed as permitting the AFC systems to adjust the calculated propagation loss by up to 6 dB for composite LPI/standard-power access points. The interference protection criteria that the AFC systems apply remains unchanged. For this reason, we do not grant those requests to waive section 15.407(l)(2).

19. To ensure that harmful interference to authorized operations and other spectrum users will not occur, we impose the following explicit conditions on approved AFC systems under this waiver, as follows:

- The AFC system must be capable of identifying composite LPI/standard-power access points based on the FCC ID and certified Equipment Class information provided by a standard-power device spectrum inquiry request.
- The AFC system is allowed to incorporate building entry loss up to and including 6 dB in its predictive propagation model calculations solely in response to a spectrum inquiry request initiated from a composite LPI/standard-power access point.

20. IT IS ORDERED that, pursuant to sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302a, 303(e), and 303(r), and sections 0.31, 0.241, and 1.3 of the Commission's rules, 47 CFR §§ 0.31, 0.241, 1.3, the Request for Waiver filed by Wi-Fi Alliance, Broadcom, Sony, Federated Wireless, and Qualcomm IS GRANTED, consistent with the terms of this Order.

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[60] *Unlicensed Use of the 6 GHz Band*, ET Docket No. 18-295, Second Report and Order, Second Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order on Remand, FCC 23-86, at 33 para. 54 (Nov. 1, 2023).

[61] 47 CFR § 15.407(k)(8)(ii).

[62] *6 GHz Report and Order*, 35 FCC Rcd at 3890, para. 106 (citing comments of APCO, NAB, and the Society of Broadcast Engineers).

[63] *Id*. at 3891, para. 107.

[64] *Wi-Fi Alliance Waiver Request*, ET Docket No. 23-107 (filed Feb. 17, 2023); *Broadcom Waiver Request*, ET Docket No. 23-107 (filed Mar. 22, 2023); *Qualcomm and Federated Wireless Waiver Request*, ET Docket No. 21-352 (filed Apr. 7, 2023); *Sony Waiver Request*, ET Docket No. 23-107 (filed Jan. 22, 2024).

[65] 47 CFR § 15.407(l).

21. IT IS FURTHER ORDERED that, pursuant to section 1.102(b) of the Commission's rules, 47 CFR § 1.102(b), this Order SHALL BE EFFECTIVE upon release.

22. IT IS FURTHER ORDERED that, if no petitions for reconsideration or applications for review are timely filed, this proceeding SHALL BE TERMINATED, and the docket CLOSED.

FEDERAL COMMUNICATIONS COMMISSION

Ira Keltz
Acting Chief
Office of Engineering and Technology