

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

In the Matter of )  
 )  
Revision of Part 15 of the Commission's Rules to ) ET Docket No. 13-49  
Permit Unlicensed National Information )  
Infrastructure (U-NII) Devices in the 5 GHz Band )

**CONSOLIDATED RESPONSE OF CISCO SYSTEMS, INC.  
TO PETITIONS FOR RECONSIDERATION**

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## EXECUTIVE SUMMARY

Cisco (i) opposes proposals advanced by certain members of the WISP industry that, if adopted, would loosen the limitations on unwanted emissions from the U-NII-1 and U-NII-3 bands, potentially subjecting incumbent users to increased risks of interference; (ii) opposes the request by AGA for reconsideration of the expansion of U-NII-3 to include 5825-5850 MHz; and (iii) supports the petition submitted by EchoStar seeking clarity regarding the maximum power levels permitted for fixed devices intended for indoor use in the U-NII-1 band, such as Wi-Fi equipped set-top boxes.

The *FR&O* represents an important first step in the Commission's efforts to reposition the 5 GHz band to meet the growing demand for unlicensed spectrum in a regulatory environment that facilitates sharing with incumbent users. Achieving that goal requires the Commission to carefully balance a wide range of disparate interests. And, it requires each unlicensed industry segment to compromise its own self-interest to protect from harmful interference those with primary spectrum rights, and to maximize the shared use of the band among unlicensed devices. The overwhelming majority of those impacted by the *FR&O* accept the compromises adopted by the Commission to maximize the efficient, shared use of the 5 GHz band. Unfortunately, a handful of outliers have decided to repeat tired arguments that have been considered by the Commission and properly rejected in the *FR&O*.

It is particularly disappointing that some in the WISP community, which was largely responsible for the U-NII-2C abuses that the *FR&O* seeks to end, appear disinclined to accept their share of the responsibility for promoting sharing of the 5 GHz band. The *FR&O* struck a careful balance in re-opening spectrum that had been closed to the unlicensed community largely due to the WISP abuses. The Commission desired to encourage the most efficient and effective use of the 5 GHz band by protecting primary incumbents and reducing the potential for interference, while maximizing unlicensed device use. Device manufacturers agreed to numerous improvements to the engineering of devices to win access to the entire U-NII-2C band to help support next generation technology. The WISPs wanted to avoid immediate disruptions to their networks, and were allowed the continued full use of the previously certificated equipment they have deployed. Consistent with the recommendation advanced by one leading WISP vendor, the Commission preserved the WISPs' ability to engage in high-powered operations, but applied the unwanted emissions limit of Section 15.407 across the entire 5725-5850 MHz band so as "to ensure that there is no increase in the potential for harmful interference from unlicensed devices operating under the new combined rule parts."

Yet, sensitive to the concerns of WISPs, the Commission allowed vendors to certificate new high-power point-to-point equipment for use by WISPs under the old, less restrictive limits on unwanted emissions for twelve months until May 1, 2015, and, they can continue to sell to WISPs equipment certificated under the less restrictive mask until May 1, 2016. Moreover, any high-powered point-to-point equipment deployed by WISPs or that is acquired through May 1, 2016 can operate without complying with the more restrictive Section 15.407 spectral mask until the end of its useful life. In other words, while recognizing that tighter limits on unwanted emissions ultimately will benefit all users of the 5 GHz band, the Commission mitigated any immediate adverse impact on WISPs and their vendors by providing ample time for them to

adjust to the same unwanted emissions limits that the U-NII community has been meeting for years. No existing WISP service is in any immediate jeopardy. The Commission reasoned that over the long term, the interference environment in the bands adjacent to U-NII-3 should improve as existing equipment is retired. The balance struck by the Commission, which Cisco supports, ensures that all participants shoulder a reasonable burden of making the band more workable for all.

In addition, the Commission should reject the calls by MSI and Cambium to allow the manufacture and sale of equipment that had been certificated under Section 15.247 (with loose unwanted emissions and lacking required security features) for the indefinite future, even if the Commission does retain the tighter spectral mask for new equipment. This is the very U-NII-3 equipment that was illegally modified by WISPs to operate in the DFS bands and that clearly caused interference to TDWR. The transition period is not only about moving to the new unwanted emissions limit, but also about implementing the new security requirements designed to prevent WISPs from taking equipment certificated for U-NII-3 that lacks DFS and modifying it to operate bands where DFS is required to protect TDWR. Cisco has no objection to a short extension of the transition deadlines if manufacturers can make a compelling case that it is not possible to redesign and recertificate equipment with a reasonable effort. But given that central role U-NII-3 equipment has played in causing interference to TDWR, any extension that delays the introduction of enhanced security features should be as brief as possible, and certainly should not be indefinite as asked by MSI and Cambium.

AGA urges the Commission to reverse the decision to expand the U-NII-3 band to spectrum immediately adjacent to that allocated for DSRC systems, a change that has the effect of tightening emissions limits at the band edge, until further testing establishes that unlicensed operations will not cause interference to DSRC. The request is misplaced and should be denied. As the *FR&O* correctly recognized, the entire 5725-5850 MHz band has been available for unlicensed use since before DSRC was established, and the *FR&O* actually toughened the unwanted emissions limit applicable to the 5825-5850 MHz portion closest to DSRC. DSRC is therefore better protected as a result of the Commission's rule change.

EchoStar identifies what appears to be an inadvertent omission from Section 15.407(a)(1) that should be rectified by clarifying that the maximum power levels specified in subsections (ii) and (iii) apply to all fixed indoor devices (such as set-top cable boxes, Wi-Fi equipped televisions, etc.), as well as fixed indoor access points.

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**CONSOLIDATED RESPONSE OF CISCO SYSTEMS, INC.  
TO PETITIONS FOR RECONSIDERATION**

Cisco Systems, Inc. (“Cisco”) submits this consolidated response to petitions seeking reconsideration of the Commission’s *First Report and Order* (the “*FR&O*”) in this proceeding.<sup>1</sup> For the reasons set forth below, Cisco: (1) opposes proposals advanced by certain members of the wireless internet service provider (“WISP”) industry that, if adopted, would loosen the limitations on unwanted emissions from the U-NII-1 and U-NII-3 bands, potentially subjecting incumbent users to increased risks of interference;<sup>2</sup> (2) opposes the request by the Association of Global Automakers, Inc. (“AGA”) for reconsideration of the expansion of U-NII-3 to include 5825-5850 MHz;<sup>3</sup> and (3) supports the petition submitted by EchoStar Technologies L.L.C.

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<sup>1</sup> See Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, *First Report and Order*, 29 FCC Rcd 4127 (2014) (“*FR&O*”).

<sup>2</sup> Petition of Cambium Networks, Ltd. for Partial Reconsideration, ET Docket No. 13-49 (filed June 2, 2014) (“Cambium Petition”); Petition of JAB Wireless, Inc. for Partial Reconsideration, ET Docket No. 13-49 (filed June 2, 2014) (“JAB Petition”); Petition of Motorola Solutions, Inc. for Partial Reconsideration, ET Docket No. 13-49 (filed June 2, 2014) (“MSI Petition”); Petition of the Wireless Internet Service Providers Ass’n for Partial Reconsideration, ET Docket No. 13-49 (filed June 2, 2014) (“WISPA Petition”).

<sup>3</sup> Petition of the Ass’n of Global Automakers, Inc. for Partial Reconsideration, ET Docket No. 13-49, at 2-3 (filed May 1, 2014) (“AGA Petition”).

(“EchoStar”) seeking clarity regarding the maximum power levels permitted for certain fixed devices intended for indoor use in the U-NII-1 band, such as Wi-Fi equipped set-top boxes.<sup>4</sup>

As will be discussed in more detail below, the *FR&O* represents an important first step in the Commission’s efforts to reposition the 5 GHz band to meet the growing demand for unlicensed spectrum in a regulatory environment that facilitates sharing with incumbent users. Achieving that goal requires on the part of the Commission a careful balancing of a wide range of disparate interests, and it requires on the part of each unlicensed industry segment a willingness to compromise its own self-interest so as to maximize the shared use of the band. The *FR&O* represents an outstanding effort by the Commission to start the process of reinventing the 5 GHz band. The fact that so few petitions for reconsideration have been filed in response to an order as broad as the *FR&O* evidences that the overwhelming majority of those impacted by the *FR&O* accept the compromises adopted by the Commission to maximize the efficient, shared use of the 5 GHz band. Unfortunately, a handful of outliers have decided to repeat tired arguments that have been considered by the Commission and properly rejected in the *FR&O*. The Commission can and should deny those petitions, as they threaten to undo the careful balancing that has been embraced by all other industry segments.

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<sup>4</sup> Petition of EchoStar Technologies L.L.C. for Reconsideration, ET Docket No. 13-49 (filed June 2, 2014) (“EchoStar Petition”).

On July 30, 2014, notice of these petitions was published in the Federal Register, commencing the pleading cycle with respect to them. *See* 79 Fed. Reg. 44150 (July 30, 2014). Cisco notes that a summary of the *FR&O* was published in the *Federal Register* on May 1, 2014 (*see* 79 Fed. Reg. 24569 (May 1, 2014)) and that, by virtue of Section 1.429(d) of the Commission’s Rules, June 2, 2014 was the deadline for the filing of petitions for reconsideration of the *FR&O*. *See* 47 C.F.R. § 1.429(d). Yet, long after that deadline, several WISP interests submitted letters purporting to seek reconsideration of the Commission’s decision to subject future U-NII-3 equipment to the unwanted emissions limit of Section 15.407. *See, e.g.*, Letter from L. Elizabeth Bowles, President and Chairman of the Board, Aristotle, Inc., to Marlene H. Dortch, Secretary, FCC, ET Docket No. 13-49 (filed July 24, 2014). Because these are untimely filed, they should be dismissed by the staff pursuant to Section 1.429(l)(9) of the Rules and considered, if at all, merely as informal comments on timely filed petitions. *See* 47 C.F.R. § 1.429(l)(9).

**I. THE COMMISSION’S CHOICES WITH RESPECT TO THE CONTINUED USE OF THE 5725-5850 MHZ BAND FOR HIGH-POWERED OPERATIONS STRIKE AN APPROPRIATE BALANCE THAT SHOULD BE MAINTAINED.**

Cisco is particularly disappointed that the WISP community has attacked the Commission’s carefully balanced decision to require all U-NII-3 devices to meet the unwanted emissions standard of Section 15.407, while affording vendors two more years to sell existing equipment lines, and allowing WISPs to use for life the equipment they have now and that they acquire during this two year period, notwithstanding the fact that this grandfathered equipment lacks security features and produces excessive unwanted emissions. The Commission should deny those petitions seeking to undo the Commission’s efforts to protect incumbent users from interference as it facilitates wider unlicensed use of the 5 GHz band.

Many of the interference problems addressed by the *FR&O* rule changes stem directly from the propensity of some WISPs to illegally modify U-NII-3 equipment to operate in other bands where dynamic frequency selection (“DFS”) circuitry is required to protect Terminal Doppler Weather Radar (“TDWR”).<sup>5</sup> The refusal of the WISP petitioners to embrace the

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<sup>5</sup> See Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, *Notice of Proposed Rulemaking*, 28 FCC Rcd 1769, 1782-83 ¶ 43, 1784-85 ¶ 49 (2013) (“*Notice*”). See also Directlink, LLC, *Forfeiture Order*, 29 FCC Rcd 1809 (EB 2014); Rapidwave, LLC, *Forfeiture Order*, 29 FCC Rcd 1109 (EB 2014); Skybeam Acquisition Corp., *Forfeiture Order*, 29 FCC Rcd 1194 (EB 2014); Ayustar Corp., *Order and Consent Decree*, 28 FCC Rcd 15420 (EB 2013); Argos Net, Inc., *Notice of Apparent Liability for Forfeiture and Order*, 27 FCC Rcd 2786 (EB 2012); Utah Broadband, *Notice of Apparent Liability for Forfeiture and Order*, 26 FCC Rcd 1419 (EB 2011); Sling Broadband, LLC, *Forfeiture Order*, 26 FCC Rcd 13062 (EB 2011); Letter from Reuben Jusino, Resident Agent, FCC, San Juan Office, to Crucito Marrero, dba CMARR, *Notice of Unlicensed Operation*, Case No: EB-11-SJ-0013, Document No: W20113268001 (June 2, 2011); Letter from Reuben Jusino, Resident Agent, FCC, San Juan Office, to The WIFI Store, *Notice of Unlicensed Operation and Notification of Harmful Interference*, Case No: EB-FIELDSCR-12-00001097, Document No: W2012326832680001 (Mar. 13, 2012); Letter from Reuben Jusino, Resident Agent, FCC, San Juan Office, to David Robles dba dmwireless, *Notice of Unlicensed Operation and Notification of Harmful Interference*, Case No: EB-FIELDSCR-12-00001096, Document No: W2012326832680002 (Mar. 13, 2012).

compromises reflected in the *FR&O* evidences a continued unwillingness on the part of the WISP community to accept its fair share of responsibility and of the costs associated with utilizing unlicensed spectrum in an environment where sharing with incumbent users is necessary.

As will be discussed in more detail below, migration to the Section 15.407 limit on unwanted emissions, and security requirements designed to minimize the ability of WISPs to illegally modify U-NII-3 equipment, were parts of a comprehensive package of rules that was specifically designed to protect TDWR operations in the adjacent U-NII-2C band. Manufacturers large and small contributed to the effort to identify this package of reforms and agreed to accept the resulting costs in the interest of benefiting the entire community of users. Cisco, for example, has supported the new device security requirements (which will impose costs on Cisco), notwithstanding the fact that Wi-Fi devices certificated under Section 15.407 were not being illegally modified to create interference to TDWR or anyone else.

While the interference to TDWR stemmed directly from illegal WISP modification of Section 15.247 devices, Cisco and the rest of the Wi-Fi community has recognized that although they were not the cause of that interference, it is in the public interest for them to accept improved security requirements to create the best possible operating environment for all users of the 5 GHz band going forward. There are two chief reasons why the Wi-Fi community has stepped up to support additional regulations in this area, and opposes the loosening of regulations proposed by some WISP parties. First, our future ability to access spectrum in bands where there are incumbent primary users depends upon the unlicensed community's willingness to act responsibly and reasonably to address problems when problems arise. We will not be invited to utilize bands where primary users exist if we do not establish a track record of accepting

responsibility for and curing problems when they arise. Second, as a Wi-Fi manufacturer, our experience with the TDWR interference cases demonstrates that bad acts by others – having nothing to do with our equipment or the operations of our equipment – can potentially disrupt our products when a regulator closes spectrum. For both these reasons, we support the Commission’s improved rules for the U-NII-2C and U-NII-3 bands.

Alone among the industry segments impacted by the new rules, members of the WISP community have sought to minimize their contribution to the Commission’s effort to improve the 5 GHz band for the future. WISPs are not offering meaningful solutions to the incumbent stakeholders that would make the band safer in the future – instead they want the Commission to allow them to continue making and using the very same equipment that has been the source of so many problems for incumbents in the past. The contrast between the Wi-Fi community and the WISP community could not be more clear. As a manufacturer, Cisco takes very seriously our obligation to be good spectrum citizens, particularly in environments where our Wi-Fi products much share spectrum with incumbent users. We believe the WISP community should do the same. To the extent the Commission decides that the WISP community need not lift a finger in response to the devastating cases of interference caused to TDWR, we will not oppose such a decision. However, we believe the FCC should base any re-evaluation of the rules adopted in the *FR&O* based not only on the protestations of harm by WISPs, but on a balancing of any harm to WISPs against the benefits to current and future users of the 5 GHz band recognized in the *FR&O*.

From the perspective of most in the unlicensed community, one of the major achievements of the *FR&O* is the Commission’s harmonization of the rules governing the 5725-5850 MHz band. Prior to the adoption of the *FR&O*, the 5725-5850 MHz band was governed by

a complex, convoluted regulatory regime that had become obsolete as technology evolved.<sup>6</sup> While the 5725-5825 MHz segment was available for unlicensed use either under the digital modulation rules set forth in Section 15.247 of the Rules or the U-NII rules set forth in Section 15.407, the 5825-5850 MHz segment was only available under the digital modulation rules. Sections 15.247 and 15.407 differed in, among other things, their limiting of maximum power levels and restrictions on unwanted emissions. As a result, as technology evolved and some vendors took advantage in the arbitrage opportunities presented by the dual regulatory scheme, the equipment authorization process became unduly complex and costly, and incumbent users of the 5 GHz band were subjected to increased interference.

In the *Notice* that commenced this proceeding, the Commission recognized that this dual regulatory scheme had outlived its usefulness and proposed to consolidate the provisions of Sections 15.407 and 15.247 in a single rule that would apply to the entire 5725-5850 MHz band.<sup>7</sup> Specifically, the *Notice* proposed that in the future, unlicensed operations would be required to comply with the long-standing requirement of Section 15.407(a)(3) that a fixed point-to-point system operating in the U-NII-3 band reduce peak transmitter power and peak power spectral density by 1 dB for every 1 dB that antenna gain exceeds 23 dB.<sup>8</sup> Doing so, the Commission explained, “will ensure that there is no increase in the potential for interference from unlicensed devices operating under the new combined rule parts.”<sup>9</sup> The *Notice* also proposed that the more restrictive limit on unwanted emissions set forth in Section 15.407 be retained “because using the more stringent unwanted emissions requirement will ensure that there is no increase in the

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<sup>6</sup> See *Notice*, 28 FCC Rcd at 1777-78 ¶¶ 24-25.

<sup>7</sup> See *id.* at 1778 ¶¶ 26-27.

<sup>8</sup> See *id.* at 1780 ¶ 33.

<sup>9</sup> *Id.*

potential for interference from unlicensed devices operating under the new combined rule parts.”<sup>10</sup>

The *Notice’s* proposals for limiting power levels<sup>11</sup> and controlling unwanted emissions<sup>12</sup> were largely applauded by the unlicensed community in general, and by at least one major WISP vendor in particular.<sup>13</sup> However, a small subset of WISP interests opposed.<sup>14</sup>

In the *FR&O*, the Commission sought to strike a balance between the concerns raised by the WISPs and the Commission’s desire to encourage the most efficient and effective use of the 5 GHz band by protecting incumbents, reducing the potential for interference, and allowing the continued full use of previously certificated equipment. On one hand, because forcing WISPs to reduce the transmitter output power of deployed equipment would be inconsistent with its stated objective of allowing full use of equipment that had been certificated under Section 15.247, the

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<sup>10</sup> *Id.* at 1780 ¶ 34.

<sup>11</sup> See Comments of Cisco Systems Inc., ET Docket No. 13-49, at 34-35 (filed May 28, 2013) (“Cisco Comments”); Comments of IEEE 802, ET Docket No. 13-49, at 18-19 (filed May 28, 2013) (“IEEE 802 Comments”); Comments of Ericsson, ET Docket No. 13-49, at 5 (filed May 28, 2013) (“Ericsson Comments”); Comments of the Telecommunications Industry Ass’n, ET Docket No. 13-49, at 11 (filed May 28, 2013); Comments of the Wi-Fi Alliance, ET Docket No. 13-49, at 13 (filed May 28, 2013) (“WFA Comments”); Comments of Motorola Solutions, Inc., ET Docket No. 13-49, at 3 (filed May 28, 2013) (“MSI Comments”) (proposing absolute maximum antenna gain of 23 dBi for fixed point-to-point systems).

<sup>12</sup> See Cisco Comments at 47; IEEE 802 Comments at 19; Comments of Motorola Mobility LLC, ET Docket No. 13-49, at 4 (filed May 28, 2013); MSI Comments at 3; Ericsson Comments at 5; WFA Comments at 13.

<sup>13</sup> Motorola Solutions, Inc. (“MSI”) specifically stated in its initial comments that “U-NII-3 devices should be subject to: . . . [m]aximum antenna gain of 23 dBi for fixed point-to-point systems” and “[u]nwanted emission limits of -17 dBm/MHz within 10 MHz of the band edge, and -27 dBm/MHz beyond 10 MHz of the band edge.” See MSI Comments at 3.

<sup>14</sup> See, e.g., Comments of Cambium Networks, Ltd., ET Docket No. 13-49, at 4 (filed May 28, 2013) (“Cambium Comments”); Comments of Fastback Networks, ET Docket No. 13-49, at 3-4 (filed May 28, 2013); Comments of the Wireless Internet Service Providers Ass’n, ET Docket No. 13-49, at 12-16 (filed May 28, 2013).

Commission sided with the WISP community and declined to require Section 15.247 systems using high-gain antennas to reduce their transmit power output.<sup>15</sup>

On the other hand, however, the Commission rejected the WISPs' call for retention of the loose Section 15.247 limit on unwanted emissions so as to "ensure that there is no increase in the potential for harmful interference from unlicensed devices operating under the new combined rule parts."<sup>16</sup> Consistent with the recommendation advanced by MSI, a leading WISP vendor, the Commission applied the unwanted emissions limit of Section 15.407 across the entire 5725-5850 MHz band.<sup>17</sup> While acknowledging arguments advanced by other WISP equipment vendors that opposed imposition of the more restrictive Section 15.407 limit on unwanted emissions because compliance allegedly would reduce tuning range or increase equipment costs, the Commission adopted its proposal as the most appropriate means of "providing appropriate protection to incumbent services."<sup>18</sup> The Wireless Internet Service Providers Association ("WISPA"), JAB Wireless, Inc. ("JAB"), and Cambium Networks, Ltd ("Cambium")<sup>19</sup> would

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<sup>15</sup> See *FR&O*, 29 FCC Rcd at 4158 ¶ 112 ("Proposals in the *NPRM* were not intended to reduce the capabilities of any of the equipment previously certified under either rule. We are persuaded that revising those gain requirements as we proposed would be inconsistent with that goal.").

<sup>16</sup> *Id.* at 4159 ¶ 114.

<sup>17</sup> See *supra* note 13.

<sup>18</sup> *FR&O*, 29 FCC Rcd at 4159 ¶ 119. Indeed, as discussed in Section II of this filing, one of the services that the Commission was intent on protecting was DSRC. See *id.* at 4160 ¶ 120.

<sup>19</sup> Cambium, albeit in a cursory footnote, asks the Commission not only to apply the old Section 15.247 unwanted emissions limit to the U-NII-3 band, but also to extend it to the U-NII-1 band that has just been opened to outdoor use. See Cambium Petition at 11 n.22. Of course, Cambium provides no technical analysis of the impact such a change would have on users spectrum adjacent to U-NII-1. Given that WISPs do not use U-NII-1 to serve subscribers and thus have no claim that they will be harmed in any way absent a loosening of the U-NII-1 spectral mask, Cambium's proposal should be rejected.

have the Commission on reconsideration reverse itself and restore the loose spectral mask previously found in Section 15.247.<sup>20</sup>

Although conveniently ignored by those seeking reinstatement of the less protective spectral mask, the Commission afforded the WISPs and their vendors substantial relief by not requiring compliance with Section 15.407's unwanted emission limit immediately upon the effective date of the new rules. Vendors can continue to certificate new high-power point-to-point equipment for use by WISPs under the old, less restrictive limits on unwanted emissions until May 1, 2015. And, they can continue to sell to WISPs equipment certificated under the less restrictive mask until May 1, 2016.<sup>21</sup> Moreover, the Commission has allowed any high-powered point-to-point equipment that has been deployed by WISPs or that is acquired through May 1, 2016 to operate without complying with the more restrictive Section 15.407 spectral mask until the end of its useful life.<sup>22</sup> In other words, while recognizing that tighter limits on unwanted emissions ultimately will benefit all users of the 5 GHz band, the Commission mitigated any immediate adverse impact on WISPs and their vendors by providing ample time for them to adjust to the same unwanted emissions limits that the U-NII community has been meeting for

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<sup>20</sup> The arguments advanced by these petitioners are quite similar to those made prior to the release of the *FR&O*. See, e.g., Cambium Comments at 3-4; Letter from Stephen E. Coran, counsel to the Wireless Internet Service Providers Ass'n, to Marlene H. Dortch, Secretary, FCC, ET Docket No. 13-49, at 2 (filed Mar. 20, 2014); Comments of Exalt Communications, Inc., ET Docket No. 13-49 (filed July 24, 2013); Letter from Dr. Kevin J. Negus, Chairman, CTO and Co-Founder, Fastback Networks, to Marlene H. Dortch, Secretary, FCC, ET Docket No. 13-49 (filed Mar. 24, 2014). However, the petitioners have attempted to bolster their position by advancing a host of facts and arguments that they had not previously advanced. Yet, none have made the effort required under Section 1.429(b) of the Rules to demonstrate that those new facts and arguments should be considered by the Commission. See 47 C.F.R. § 1.429(b).

<sup>21</sup> See *FR&O*, 29 FCC Rcd at 4162 ¶ 129, 4163 ¶ 134.

<sup>22</sup> See *id.* at 4162 ¶ 129 n.199.

years. For all the proclamations of doom and gloom coming from the WISP community in the aftermath of the *FR&O*, the fact is that no existing service is in any immediate jeopardy.

Indeed, those seeking a return to the less restrictive spectral mask blindly ignore the Commission's objective of promoting sharing of the 5 GHz band by assuring that incumbent users of spectrum adjacent to U-NII-3 are fully protected against interference now and in the future. One WISP petitioner, for example, objects to the *FR&O* because purportedly “[t]here is a demonstrable lack of any specificity regarding who might experience the interference,”<sup>23</sup> while another asserts that the only justification cited by the Commission for requiring compliance with the Section 15.407 limit on unwanted emissions is “the Commission’s administrative convenience in having the same OOB limit for the U-NII-3 band as for other U-NII bands.”<sup>24</sup> These mis-statements are inexplicable – the *FR&O* could not have been more clear in explaining that the decision to impose the more restrictive unwanted emissions limit (albeit subject to the generous grandfathering discussed above), not only provides consistency across the 5 GHz band, but also ensures appropriate interference protection to TDWR and to Dedicated Short Range Communication (“DSRC”).<sup>25</sup>

The approach adopted by the Commission was an appropriate one. While some of the petitioners now proclaim that there is no evidence of TDWR interference due to unwanted emission,<sup>26</sup> the Department of Commerce’s January 2013 report on the viability of sharing the 5 GHz band established that “during a recent investigation of interference from outdoor higher

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<sup>23</sup> WISPA Petition at 11.

<sup>24</sup> Cambium Petition at 2.

<sup>25</sup> See, e.g., *FR&O*, 29 FCC Rcd at 4159 ¶ 119 (noting that new rules not only provides constancy, but also “provid[es] appropriate protection to incumbent services.”); *id.* at 4160 ¶ 120 (noting that application of Section 15.407 to the enlarged U-NII-3 band will reduce unwanted emissions and thus provide greater protection to DSRC.).

<sup>26</sup> See Cambium Petition at 12, JAB Petition at 8; WISPA Petition at 4.

EIRP U-NII devices to the Terminal Doppler Weather Radar system, NTIA determined that some U-NII devices moved off of the channel, but still caused interference due to the transmitter out-of-channel emission levels being too high.”<sup>27</sup> That report stressed that “[t]his problem has only been encountered with U-NII devices used for outdoor point-to-point applications.”<sup>28</sup> As noted above, Wi-Fi products were never a problem.

More importantly, the Commission does not need to demonstrate actual interference before it can proactively adjust its rules to prevent interference from occurring in the future. As Cisco noted earlier in this proceeding, imposing the Section 15.407 unwanted emissions mask on new equipment “will ensure that there is no increase in the potential for interference due to out-of-band emissions and, over time, will improve the RF environment as devices certified under Section 15.247 are replaced in the normal course with devices certified under the new regulatory regime.”<sup>29</sup> That improvement will inure to the benefit of TDWR and DSRC and potentially other users of the U-NII-2 and U-NII-4 bands.

Before reversing itself to accommodate the WISPs, the Commission must assess the risks of increased interference due to unwanted emissions. In doing so, the Commission must consider the breadth of the WISPs’ proposals. While the petitioners focus their discussion on rural markets, their call for a reinstatement of the loose spectral mask that had been in Section 15.247 is not limited solely to rural markets. WISPs also operate in urban markets, and operators

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<sup>27</sup> See Department of Commerce, *Evaluation of the 5350-5470 MHz and 5850-5925 MHz Bands Pursuant to Section 6406(B) of the Middle Class Tax Relief and Job Creation Act of 2012*, at B-15 (Jan. 2013) (“NTIA Report”) (citation omitted), [http://www.ntia.doc.gov/files/ntia/publications/ntia\\_5\\_ghz\\_report\\_01-25-2013.pdf](http://www.ntia.doc.gov/files/ntia/publications/ntia_5_ghz_report_01-25-2013.pdf). That report was cited in the *Notice* and the *FR&O* and made a part of the record in this docket. *Notice*, 28 FCC Rcd at 1774 ¶ 13 n.21; *FR&O*, 29 FCC Rcd at 4127-28 ¶ 1 n.1.

<sup>28</sup> *Id.* at B-15 n.116.

<sup>29</sup> Reply Comments of Cisco Systems, Inc., ET Docket No. 13-49, at 21 (filed July 24, 2013) (citation omitted).

in those markets have embraced the proposed loosening of the spectral mask.<sup>30</sup> Indeed, the record of interference from WISPs to TDWR facilities gives the Commission all the proof it needs to recognize that this is not purely a rural matter.

Nor do the petitioners seeking a loosened mask limit their proposal to the highest-power equipment that they claim will be so difficult to bring into compliance. Rather, they would loosen the mask across-the-board, allowing a myriad of devices with high levels of unwanted emissions in more densely populated areas where the density of devices could become problematic. Thus, even if the Commission assumes that the risks of interference are lower in rural areas, it must understand that the WISPs are seeking a much broader relief.

That said, Cisco has serious doubts that the costs of complying with Section 15.407 limits on unwanted emissions – limits that were specifically endorsed by one major WISP equipment vendor – will approach the figures bandied about in the petitions. Even assuming that the petitioners have fully scoured the market for available filters that would meet the mask – and it is not clear they have – the filter manufacturing community is a resourceful one. The ink is barely dry on the new rules, and once the WISP vendors and their filter suppliers have an opportunity to engage in further development activities, the Commission can reasonably expect that compliance will be far less expensive, and with far less (if any) reduction in tuning range, than today’s doom and gloom projections. Far more scrutiny is required before the Commission can accept the

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<sup>30</sup> *See, e.g.*, Letter from Nathan Geipel, X1 Communications, to Marlene H. Dortch, Secretary, FCC, ET Docket No. 13-49 (filed July 3, 2014) (“We service a very urban market. We provide service to mainly businesses in the Winston-Salem, NC area.”); Letter from Hugh Bethell, General Manager, Port Networks, Inc., to Marlene H. Dortch, Secretary, FCC, ET Docket No. 13-49 (filed July 18, 2014) (“[W]e serve a high-density, urban market [Baltimore]. . . . Most of our customers are served by point-to-multipoint equipment, set up in clusters atop tall buildings downtown.”).

petitioners' claims regarding the cost and spectrum penalty of compliance with the Section 15.407 spectral mask.

Moreover, even if there are material additional costs or reductions in available spectrum, the WISP claim that the rural broadband is doomed is disingenuous. To the contrary, while the petitions proclaim that U-NII-3 is uniquely suited to providing service over long links, the close proximity of most WISP subscribers to the base station will often allow the use of bands other than U-NII-3 to continue service at lower cost. JAB concedes, for example, that less than 25% of its subscribers are located more than 4 miles from the base station.<sup>31</sup> In addition to the 5 GHz band, WISPs have access to a wide range of unlicensed and licensed light spectrum, including the TV white spaces, 900 MHz, 2.4 GHz, and 3.65 GHz, and over the coming years they are likely to secure access to the 3550-3650 MHz band. One can assume that even if U-NII-3 equipment becomes prohibitively expensive as a result of the more restrictive unwanted emissions limit, most subscribers can be migrated to other bands when the 5 GHz equipment they use today reaches the end of its life. The future of rural broadband does not hang in the balance here.

Finally, the Commission should reject the calls by some in the WISP community to allow the sale of equipment that had been certificated under Section 15.247 for the indefinite future, even if the Commission does retain the Section 15.407 mask for new equipment. MSI and Cambium both suggest that it will take more than two years to modify devices to comply with Section 15.407, but rather than suggest an extension of the transition period for the time it will take to complete the task with appropriate diligence, they urge the Commission to allow manufacturers an indefinite time to manufacture, market, and import devices that had been

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<sup>31</sup> See JAB Petition at 2.

certified under Section 15.247.<sup>32</sup> Their positions are largely rehashes of what they argued to the Commission previously – arguments that led the *FR&O* to state that “[w]hile we are sympathetic to the arguments of commenters that the more restrictive unwanted emission limits for digital modulation devices may present design challenges for some manufacturers, we find that it is in the public interest to implement the changes as soon as possible to eliminate the potential of harmful interference to TDWRs.”<sup>33</sup>

Both MSI and Cambium claim that unwanted emissions was not a cause of interference to TDWR and thus there is no need to ever end the manufacture and sale of currently-certificated equipment.<sup>34</sup> Even were it true that unwanted emissions have not been a problem, and there is record evidence to the contrary,<sup>35</sup> what MSI and Cambium conveniently ignore is that the very U-NII-3 equipment they want to sell in perpetuity is the equipment that was modified by WISPs to operate in the DFS bands and that clearly caused interference to TDWR.<sup>36</sup> The transition period is not only about transitioning to the new unwanted emissions limit, but also about transitioning to the new security requirements designed to prevent WISPs from taking equipment certificated for U-NII-3 that lacks DFS and modifying it to operate bands where DFS is required to protect TDWR.

Simply put, Cisco has no objection to a short extension of the transition deadlines if manufacturers can make a compelling case that it is not possible to redesign and recertificate equipment with a reasonable effort. But given that central role U-NII-3 equipment has played in

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<sup>32</sup> See MSI Petition at 3-4; Cambium Petition at 14-15.

<sup>33</sup> *FR&O*, 29 FCC Rcd at 4162 ¶ 129.

<sup>34</sup> See MSI Petition at 4; Cambium Petition at 15.

<sup>35</sup> NTIA Report at B-15.

<sup>36</sup> See *supra* note 5.

causing interference to TDWR, any extension that delays the introduction of enhanced security features should be as brief as possible, and certainly should not be indefinite as asked by MSI and Cambium.

## **II. THE COMMISSION SHOULD NOT REVERSE ITS EXPANSION OF THE U-NII-3 BAND.**

In its petition, AGA urges the Commission to reverse the decision to expand the U-NII-3 band to spectrum immediately adjacent to that allocated for DSRC systems until further testing establishes that unlicensed operations will not cause interference to DSRC. The new rule adopted by the *FR&O* in fact better protects DSRC systems than the rule that preceded it. The Commission should not reverse itself.

As noted above, when the *Notice* proposed to extend the upper edge of the U-NII-3 band to 5850 MHz and consolidate the provisions of Sections 15.407 and 15.247 in a single rule,<sup>37</sup> the Commission explained that “[a]dopting this proposal would not increase the potential for harmful interference because this 25 megahertz segment is already available for devices certified under Section 15.247.”<sup>38</sup> Although the Commission’s proposal was widely applauded, AGA expressed concern that adoption of the proposal would result in increased unwanted emissions into the DSRC band. Nonetheless, the *FR&O* adopted the proposal advanced in the *Notice* because it “should help eliminate potential harmful interference from unlicensed device to other spectrum users.”<sup>39</sup>

On reconsideration, AGA claims that the expansion of the U-NII-3 upper edge from 5825 to 5850 MHz and the use of Section 15.407 standards for unwanted emissions subjects DSRC to

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<sup>37</sup> See *Notice*, 28 FCC Rcd at 1778 ¶¶ 26-27.

<sup>38</sup> *Id.* at 1778 ¶ 27.

<sup>39</sup> *FR&O*, 29 FCC Rcd at 4153 ¶ 92.

a greater risk of interference.<sup>40</sup> However, in response to similar arguments advanced by AGA in commenting on the *Notice*, the *FR&O* emphasized that “[u]nlicensed devices are already allowed to operate within the 5.825-5.85 GHz band under Section 15.247 of our rules with higher unwanted emission levels than we are adopting for the new combined rule part. We are simply consolidating the existing rules into a single rule section, which will not increase the risk of harmful interference to DSRC services.”<sup>41</sup> Reiterating the same point, the *FR&O* subsequently notes that:

We disagree with Alliance and Global that adopting the more stringent unwanted emission limit from Section 15.407 will increase the harmful interference risk to DSRC services. Unlicensed devices are already allowed to operate within the 5.825-5.85 GHz band under Section 15.247 of our rules with higher unwanted emission levels than we are adopting for the new combined rule part. We are simply consolidating the existing rules into a single section, which will decrease, not increase the risk of harmful interference to DSRC services.<sup>42</sup>

Given this clear reasoning by the Commission, AGA’s assertion that the Commission “does not explain why the inchoate interests of Wi-Fi users . . . should outweigh the very tangible and pressing needs of ITS systems operators”<sup>43</sup> is difficult to comprehend. Clearly, the Commission did weigh the interests of the DSRC community and found that its actions would better protect DSRC from Wi-Fi and other unlicensed users already in the 5825-5850 MHz segment.<sup>44</sup> That finding is consistent with the record, and should not be reversed on reconsideration.

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<sup>40</sup> AGA Petition at 4-7.

<sup>41</sup> *FR&O*, 29 FCC Rcd at 4153-54 ¶ 94.

<sup>42</sup> *See id.* at 4160 ¶ 120.

<sup>43</sup> AGA Petition at 8.

<sup>44</sup> *FR&O*, 29 FCC Rcd at 4153-54 ¶¶ 93-94, 4159-60 ¶¶ 118-120. It is well settled that the Commission need not be wedded to a particular spectrum allocation, but “is entitled to

### **III. THE COMMISSION SHOULD MODIFY SECTION 15.407(A)(1) TO SPECIFY MAXIMUM POWER LEVELS FOR INDOOR FIXED DEVICES.**

In its petition, EchoStar seeks clarification regarding the maximum permissible power levels for fixed devices intended for indoor use in the U-NII-1 band that are not access points, such as Wi-Fi equipped set-top boxes.<sup>45</sup> In so doing, EchoStar identifies what appears to be an inadvertent omission from Section 15.407(a)(1) that should be addressed by clarifying that the maximum power levels specified in subsections (ii) and (iii) apply equally to fixed indoor access points and other fixed indoor devices.

The problem, simply stated, is that while revised Section 15.407(a)(1) establishes maximum U-NII-1 band power levels for outdoor access points in subsection (i), for indoor access points in subsections (ii) and (iii), and for mobile and portable client devices in subsection (iv), nowhere does it address fixed devices that are not access points. It makes sense for U-NII-1 devices that are highly moveable to be subject to more restrictive power limits of subsection (iv) because they can be utilized outdoors. However, for the reasons set forth by EchoStar, devices that rely on AC power such as Wi-Fi equipped set-top boxes, Wi-Fi equipped television sets, and other devices that are intended for use from a fixed indoor location, can operate without risk of

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reconsider and revise its views as to the public interest and the means needed to protect that interest, if it gives a reasoned explanation for the revision.” *DirectTV, Inc. v. FCC*, 110 F.3d 816, 826 (D.C. Cir. 1997) (quotation omitted) (citation omitted). The Commission may even take an action that “upset expectations based on prior law” even if the “rule affects a regulated entity’s investment made in reliance on the regulatory status quo . . . ‘if it is reasonable.’” *Mobile Relay Assocs. v. FCC*, 457 F.3d at 11 (quoting *DirectTV Inc.*, 110 F.3d at 826). Here, the Commission articulated a reasoned explanation for its decision to consolidate the dual regulatory regime in the 5725-5850 MHz band to increase the band’s utility, while retaining the tighter Section 15.407 unwanted emissions limit. The *FR&O* thus represents a lawful exercise of the Commission’s authority over the spectrum, and need not be modified on reconsideration.

<sup>45</sup> See EchoStar Petition.

interference at the higher power levels set forth in subsections (ii) and (iii).<sup>46</sup> Thus, the Commission should modify subsections (ii) and (iii) to make clear that they are applicable to all fixed indoor devices.

#### IV. CONCLUSION.

While the EchoStar Petition appropriately seeks to fill an unintended gap in the rules, the other petitions for reconsideration addressed above seek to put narrow self-interest above the Commission's well-reasoned balancing of competing interests. The *FR&O* achieves a delicate balance that promises to significantly advance the ability of all industry segments to share the 5 GHz band, and that balance should not be upset on reconsideration.

Respectfully submitted,

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<sup>46</sup> *See id.* at 2-3. The Commission should be clear that by classifying set-top boxes and similar fixed indoor devices as fixed devices for purposes of Section 15.407(a)(1), it is not altering their classification as mobile devices for purposes of the Commission's RF exposure limits under Section 2.1091. And, it should be clear that by classifying these devices as mobile devices for purposes of Section 2.1091, it is not impacting their classification as fixed devices for purposes of Section 15.407(a)(1).