

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

In the Matter of )  
 )  
Terrestrial Use of the 2473-2495 MHz Band )  
for Low-Power Mobile Broadband Networks; ) IB Docket No. 13-213  
Amendments to Rules for the Ancillary ) RM-11685  
Terrestrial Component of Mobile Satellite )  
Service Systems )

**COMMENTS OF CISCO SYSTEMS, INC.**

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## EXECUTIVE SUMMARY

The evolution of the 2.4 GHz unlicensed band from what was once thought of as a “garbage” band to the home of Wi-Fi and other popular unlicensed technologies has been an extraordinary Commission success story. Cisco has no opposition in principle to Globalstar’s use of its MSS spectrum to provide TLPS. However, accommodation of Globalstar’s newest business plan should not adversely impact the utility of the 2.4 GHz commons for the millions of Americans who are relying upon the band to meet their Wi-Fi and other unlicensed needs.

Cisco is pleased that, consistent with Globalstar’s own oft-stated commitments to the Commission, the *NPRM* expressly provides that “[w]e do not intend to grant Globalstar any additional or different interference protection rights than those that currently apply to existing unlicensed operations in the 2473-2483.5 MHz band under Part 15” and that “Globalstar’s managed operations in the 2473-2483.5 MHz band would not be entitled to interference protection from licensed services, other Part 15 devices, or Part 18 ISM devices.”

Cisco supports the limits on power and unwanted emissions proposed in the *NPRM*.

To assure that consumers’ ability to access the unlicensed commons below 2483.5 MHz is not frustrated by Globalstar, Globalstar should be required to describe in far more detail exactly how it intends to “update” the software in consumers’ existing IEEE 802.11 devices to empower those devices to operate on IEEE 802.11 Channel 14 and how it will thereafter utilize network management and security techniques to control these modified devices “to prevent unauthorized use of the 2473-2495 MHz band.” The Commission should mandate that the specific software modifications Globalstar makes to existing IEEE 802.11 devices and any network management techniques it employs will not hamper in any manner the ability of a modified consumer device to fully utilize the 2473-2483.5 MHz band for traditional Wi-Fi communications with a non-Globalstar access point. In this manner, the Commission can assure that end users who happen to have access to Globalstar’s TLPS do not find their non-Globalstar Wi-Fi communications compromised.

Globalstar’s proposed software modifications to existing IEEE 802.11 devices should be subject to the same permissive change rules as apply to all other devices. If an IEEE 802.11 device was certificated as a software defined radio, permissive change treatment is available but, if not, the rules do not permit such treatment. Cisco supports the Commission’s commitment to streamline the equipment authorization process, and rather than single out Globalstar for extraordinary *ad hoc* relief, the Commission should redouble its efforts to revise KDB 178919, expand the use of electronic labeling, and otherwise streamline the equipment modification process.

Finally, whatever the Commission does in this proceeding, it should not retreat from its commitment to expanding use of the 5 GHz band for IEEE 802.11 devices. The benefits promised by Globalstar’s latest business plan pale in comparison to the public benefits that will be achieved as the Commission opens the 5.35-5.47 GHz and 5.85-5.925 GHz bands for Wi-Fi use and allows the potential of IEEE 802.11ac to be fully realized.

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**COMMENTS OF CISCO SYSTEMS, INC.**

Cisco Systems, Inc. (“Cisco”) submits these comments in response to the Commission’s *Notice of Proposed Rulemaking* (the “*NPRM*”) soliciting input on proposed rules that, if adopted, will permit Globalstar, Inc. (“Globalstar”) to provide “terrestrial low power service” (“TLPS”) by coupling its Mobile Satellite Service (“MSS”) spectrum at 2483.5-2495 GHz with unlicensed commons spectrum in the adjacent 2473-2483.5 MHz band.<sup>1</sup> As discussed in more detail below, although Cisco has no opposition in principal to Globalstar’s use of its MSS spectrum to provide a terrestrial broadband service, the Commission must structure the rules surrounding TLPS and condition any ancillary terrestrial component (“ATC”) authorization granted Globalstar to assure that the public’s access to the entire 2.4 GHz unlicensed commons is unimpeded and fully protected.

**I. INTRODUCTION.**

Since its inception in 1984, Cisco has become the world’s largest provider of networking technology, equipment, solutions and services used in the deployment and management of next generation broadband networks. Among other things, Cisco has been a global leader in the

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<sup>1</sup> See Terrestrial Use of the 2473-2495 MHz Band for Low-Power Mobile Broadband Networks; Amendments to Rules for the Ancillary Terrestrial Component of Mobile Satellite Service Systems, *Notice of Proposed Rulemaking*, 28 FCC Rcd 15351 (2013) [“*NPRM*”].

manufacture of products based on the IEEE 802.11 standard for unlicensed wireless local area network devices, developing a range of wireless access points, controllers, antennas and integrated management tools that meet the unique needs of the enterprise and service provider segments of the marketplace. As such, Cisco is vitally interested in any proposed changes to the Commission's rules and policies governing unlicensed use of the 2.4 GHz band.

The *NPRM* is an outgrowth of Globalstar's 2012 proposal for rule changes that would permit it to deploy frequency division duplex Long Term Evolution ("FD-LTE") technology in its MSS spectrum, as well as to launch TLPS in the 2473-2495 MHz band.<sup>2</sup> This band coincides with the 22 megahertz channel designated by IEEE 802.11 as Channel 14. That channel, ironically, is not available to the public for Wi-Fi use in the United States today because the 2483.5-2495 MHz portion of Channel 14 is licensed to Globalstar for MSS and unlicensed communications use is barred to protect MSS.

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<sup>2</sup> Petition of Globalstar, Inc. for Rulemaking, RM-11685 (filed Nov. 13, 2012) ["Globalstar Petition"]. Globalstar has stated that "[w]hile Globalstar's long-term vision for terrestrial use of the Big LEO band is focused on using FDD LTE technology, Globalstar-managed TLPS deployments will likely remain the most efficient, economically viable terrestrial application over the long term in some geographic areas, including areas with lower population densities." *Id.* at 18. While Cisco appreciates that there may be little demand for yet another FD-LTE band in rural areas, because unlicensed spectrum congestion similarly does not appear to be a problem in areas with lower population densities, as Globalstar transitions to LTE in populated areas, TLPS appears destined to become a rural solution in search of a problem.

The *NPRM* does not propose rules that would implement Globalstar's proposal for deployment of FD-LTE technology in its MSS spectrum. See *NPRM*, 28 FCC Rcd at 15352 ¶ 2. Cisco does have serious concerns regarding that proposal, particularly due to the potential for FD-LTE to interfere with nearby IEEE 802.11 devices. See, e.g., CEPT Electronic Communications Committee, *Broadband Wireless Systems Usage in 2300-2400 MHz*, ECC Report 172, at §6.2 (Mar. 2012), <http://www.erodocdb.dk/docs/doc98/official/pdf/ECCRep172.pdf>. Cisco hopes to more fully document its concerns regarding LTE use adjacent to the unlicensed 2.4 GHz band should the Commission propose to amend its rules in the future to accommodate Globalstar's desire to launch an FD-LTE service in its MSS spectrum.

Globalstar proposes to implement TLPS by modifying the software within existing IEEE 802.11 consumer devices to activate use of Channel 14<sup>3</sup> and deploying a managed network of new master access points operating across the 2473-2495 MHz band.<sup>4</sup> Behind Globalstar's new moniker, TLPS will be nothing more than a paid Wi-Fi offering using the legacy IEEE 802.11b/g/n amendments – an offering that is only possible because of the happenstance that Globalstar's MSS spectrum is adjacent to the unlicensed commons. The offering is aided by the Commission's technical restrictions on unlicensed commons that were adopted to protect a satellite service that Globalstar de-emphasizes at every turn.<sup>5</sup> Recognizing that “significant concerns have been raised about potential detrimental impacts on unlicensed devices” should the Globalstar proposal be adopted,<sup>6</sup> the *NPRM* seeks comment on a wide range of issues, including

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<sup>3</sup> Globalstar contends that “[m]ost 802.11-enabled consumer devices have the hardware needed to operate at 2473-2495 MHz, but they lack the physical capability to operate above 2483.5 MHz in the United States because of restrictions in their radiofrequency (“RF”) software.” Globalstar Petition at 17. It is not clear to Cisco that this is necessarily the case, and Cisco looks forward to reviewing the responses from manufacturers of 2.4 GHz Wi-Fi consumer devices that will inform the record on whether Channel 14 actually can be activated in client devices by a simple software upgrade.

<sup>4</sup> *See id.* at 42 n.105. (“Globalstar anticipates that, in contrast [to its proposed reliance on modified 802.11 client devices], most if not all TLPS access points will be newly manufactured equipment.”).

<sup>5</sup> While Globalstar has claimed TLPS will offer higher data rates than traditional Wi-Fi at 2.4 GHz, the Commission should note that Globalstar is not proposing here any technological advancement. To the contrary, Globalstar's plan is built around use of the legacy IEEE 802.11b/g/n amendments. To the extent that Globalstar's TLPS may offer higher speeds, it will simply be because fewer users will be willing to pay Globalstar for the privilege of using its spectrum and thus fewer users will be sharing Channel 14 compared to other 2.4 GHz Wi-Fi channels. *See, e.g.*, Letter from Regina M. Keeney, Counsel to Globalstar, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, RM-11685, Att. at 14 (filed Sept. 20, 2013) [“Globalstar Ex Parte”]. Were the Commission to modify the Part 15 unwanted emissions limits that effectively preclude Wi-Fi use of the 2473-2483.5 band, as discussed *infra* at note 17, the net result would be to improve speeds for all who use 2.4 GHz Wi-Fi by eliminating Globalstar's preferential access to that unlicensed band.

<sup>6</sup> *NPRM*, 28 FCC Rcd at 15352 ¶ 1.

the potential harm that implementation of TLPS could cause to consumers who rely on Wi-Fi delivered over the 2.4 GHz unlicensed commons.

The evolution of the 2.4 GHz unlicensed band from what was once thought of as a “garbage” band to the home of Wi-Fi and other popular communications technologies has been an extraordinary Commission success story. Indeed, as the record recently developed in connection with the Commission’s 5 GHz proceeding (ET Docket No. 13-49) established, the remarkable growth of consumer demand for Wi-Fi has caused the 2.4 GHz band to be saturated in many locations.<sup>7</sup> The Commission’s actions last month to facilitate greater unlicensed use of the 5 GHz band should, over time, slow the rate at which the 2.4 GHz band is becoming congested. As the Commission has recognized, the recently-adopted 5 GHz-only IEEE 802.11ac MAC/PHY can deliver much faster speeds to consumers, in large part because it takes advantage of the much wider maximum channel bandwidths available at 5 GHz as compared to those available at 2.4 GHz and because the wealth of spectrum at 5 GHz promises to reduce the congestion that can slow the 2.4 GHz band to a crawl.<sup>8</sup> Thus, as more IEEE 802.11ac-compliant

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<sup>7</sup> See, e.g., Comments of the Nat’l Cable & Telecommunications Ass’n, ET Docket No. 13-49, at 1, 7-9 (filed May 28, 2013), *citing* Rob Alderfer, *WiFi Spectrum: Exhaust Looms*, at 7, CABLELABS (May 2013); Comments of Google, Inc. and Microsoft Corporation, ET Docket No. 13-49, at 3 (filed May 28, 2013) (the 2.4 GHz unlicensed band “has become saturated during certain times of day in heavily trafficked areas such as city centers, apartment buildings, and public venues. This congestion imposes a large cost on consumers because Wi-Fi is the most heavily used method of wireless broadband connectivity and the 2.4 GHz band is the core Wi-Fi band today.”) (citation omitted); Comments of Cisco Systems, Inc., ET Docket No. 13-49, at i (filed May 28, 2013) [“Cisco Comments”] (“capacity constraints [are] already being felt in the 2.4 GHz band.”). See also Julius Genachowski, Chairman, Federal Communications Commission, Prepared Remarks at University of Pennsylvania – Wharton, Philadelphia, PA, *Winning the Global Bandwidth Race: Opportunities and Challenges for Mobile Broadband*, at 11 (Oct. 4, 2012) (“Wi-Fi networks [are] get[ting] more and more congested – have you tried using Wi-Fi in a busy airport recently?”).

<sup>8</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*, FCC 14-30, at ¶ 9. See also Cisco Comments at 17-21.

equipment is deployed, an increasing percentage of Wi-Fi traffic will be driven to the 5 GHz band to take advantage of the benefits of higher speeds and reduced congestion. However, the 2.4 GHz band will continue to be an important source of unlicensed spectrum for the foreseeable future because of the continued use of legacy IEEE 802.11b/g/n devices, because the demand for Wi-Fi is projected to outpace the Commission's ability to allocate additional spectrum resources,<sup>9</sup> and because the 2.4 GHz band is the only globally harmonized unlicensed band suitable for Wi-Fi.

Given the continuing importance of the 2.4 GHz band, it is imperative that any efforts the Commission makes to accommodate Globalstar's newest business plan do not adversely impact the utility of the 2.4 GHz band for the millions of Americans who are relying upon the band to meet their Wi-Fi and other unlicensed needs. However, it is equally imperative that whatever the Commission does in this proceeding, it not retreat from its commitment to expanding the use of the 5 GHz band for IEEE 802.11 devices. Whatever benefits may be promised by Globalstar's latest business plan, they pale in comparison to the public benefits that will be achieved as the Commission opens the 5.35-5.47 GHz and 5.85-5.925 GHz bands for Wi-Fi use so the advantages of IEEE 802.11ac can be fully realized.<sup>10</sup>

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<sup>9</sup> Cisco has projected that by 2017, 62 percent of all United States Internet traffic will traverse Wi-Fi, with the amount of data growing from approximately 10 Exabytes per month in 2013 to approximately 25 Exabytes per month in 2017. *See* Letter from Mary L. Brown, Director, Government Affairs, Cisco Systems, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 13-49, Att. at slide 1 (filed Sept. 27, 2013).

<sup>10</sup> Indeed, while Globalstar trumpets its plan to deploy 20,000 TLPS base stations (*see* Letter from L. Barbee Ponder IV, General Counsel and Vice President Regulatory Affairs, Globalstar, Inc., to Mignon Clyburn, Chairwoman, Federal Communications Commission, RM-11685, at 2 (filed June 10, 2013)), the cable industry alone has deployed over 100,000 base stations that utilize the 5 GHz band and should be able to quickly take advantage of the opening of 100 megahertz at 5.15-5.25 GHz for outdoor use. *See, e.g.,* Dirk Grunwald, *et al.*, *5 GHz UNII-1: Wi-Fi and Globalstar Sharing Analysis*, at 9 (“the Cable WiFi consortium now operates well-over 200,000 Wi-Fi access points, and around half are deployed indoors in retail establishments, schools and airports.”), *filed as attachment to* Letter from Rick Chessen, Senior Vice President Law and Regulatory Policy, Nat'l Cable & Telecommunications Ass'n, to Julius Knapp, Chief,

## II. DISCUSSION.

### A. *GLOBALSTAR MUST BE HELD TO ITS COMMITMENT TO MAINTAIN THE 2.4 GHZ BAND COMMONS.*

Upon the filing of the Globalstar Petition, concerns were expressed from several quarters that Globalstar was seeking to convert the 2473-2483.5 MHz band to Globalstar's own exclusive use.<sup>11</sup> In response, Globalstar represented to the Commission that it was not proposing any change to the Part 15 commons nature of that spectrum:

Globalstar is not seeking to convert the unlicensed frequencies at 2473-2483.5 MHz into its own exclusively licensed spectrum. This unlicensed spectrum will remain unlicensed, and any party now and in the future will be able to operate there in a manner consistent with the Commission's existing rules. Globalstar's TLPS does not require operating rights that are superior to those of other unlicensed users nor special interference protections from other unlicensed operations, and Globalstar has not made any such requests.<sup>12</sup>

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Office of Engineering and Technology, Federal Communications Commission, ET Docket No. 13-49 (filed Jan. 22, 2014). Or put another way, the opening of the 5 GHz U-NII-1 band empowered five times the number of base stations as Globalstar envisions for TLPS and each will have immediate access to five times the amount of new spectrum as TLPS will use.

<sup>11</sup> See, e.g., Comments of Wi-Fi Alliance, RM-11685, at 5 (dated Jan. 2, 2013) ["Wi-Fi Alliance Comments"] ("The spectrum commons is supposed to be in place so that radio innovators can use the spectrum to its fullest extent, limited by the requirement not to cause interference to the licensees around it. By licensing some previously designated commons spectrum to a single firm, the FCC would diminish the spectrum available for future innovation in the commons.") (citation omitted); Comments of Wireless Internet Service Providers Ass'n, RM-11685, at 3 (filed Jan. 14, 2013) ("Globalstar essentially seeks to privatize the 2473-2483.5 MHz portion of the unlicensed band"); Comments of the Ass'n of Home Appliance Manufacturers, RM-11685, at 3-4 (filed Jan. 14, 2013).

<sup>12</sup> Consolidated Reply of Globalstar, Inc., RM-11685, at i-ii (filed Jan. 29, 2013) ["Globalstar Reply"]. See also *id.* at 2 ("Globalstar emphasizes that it is not seeking to convert the unlicensed frequencies at 2473-2483.5 MHz into its own exclusively licensed spectrum. This unlicensed spectrum at 2473-2483.5 MHz will remain unlicensed, and any party now and in the future will be able to operate there in a manner consistent with existing Commission rules. Globalstar does not request operating rights that are superior to those of other unlicensed users nor does it seek protection from interference from other unlicensed operations, and Globalstar's TLPS requires no such preferred treatment."); *id.* at 13 ("Globalstar clarifies that, with this proposal, it is not

Globalstar further acknowledged that “[l]ike other unlicensed services, TLPS transmissions on unlicensed spectrum below 2483.5 MHz will enjoy no protection from interference from other licensed and unlicensed operations. In particular, Globalstar’s TLPS will accept harmful interference from unlicensed operations on Wi-Fi Channel 11 . . . .”<sup>13</sup>

Cisco is pleased that, consistent with Globalstar’s own statements, the *NPRM* expressly provides that “[w]e do not intend to grant Globalstar any additional or different interference protection rights than those that currently apply to existing unlicensed operations in the 2473-2483.5 MHz band under Part 15” and that “Globalstar’s managed operations in the 2473-2483.5 MHz band would not be entitled to interference protection from licensed services, other Part 15 devices, or Part 18 ISM devices.”<sup>14</sup> Whatever the marginal benefits of Globalstar’s TLPS may be, they do not justify jeopardizing the ability of the public at large to make use of the 2.4 GHz unlicensed allocation for Wi-Fi or any of the many other popular uses of the unlicensed 2.4 GHz commons.

Moreover, the Commission should be cognizant that if it proceeds with permitting TLPS, the impact may be felt beyond the United States. As Globalstar itself has recognized, the 2.4 GHz unlicensed band “is the world’s best model for globally harmonized spectrum.”<sup>15</sup> Any

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seeking to convert the unlicensed frequencies at 2473-2483.5 MHz into its own exclusively licensed spectrum.”).

<sup>13</sup> *Id.* at 14. Globalstar also recognizes that “to the extent that (i) Globalstar cannot determine the location of the interference within the 2473-2495 MHz band, or (ii) such interference occurs in both the licensed and unlicensed portions of the TLPS spectrum, Globalstar will have to accept this interference to its TLPS.” *Id.* at n.30.

<sup>14</sup> *NPRM*, 28 FCC Rcd at 15359 ¶¶ 19-20 (citation omitted).

<sup>15</sup> *See* Globalstar Ex Parte at Att. at 15. *See also, e.g.*, Comments of Bluetooth Special Interest Group, RM-11685, at 3-4 (filed Jan. 14, 2013); Wi-Fi Alliance Comments at 5 (“The 2400 - 2483.5 MHz band is globally harmonized, and is the workhorse today for smartphones, tablets, laptops and other consumer devices depending on Wi-Fi and Bluetooth. Shrinking available

move by the United States that intentionally or inadvertently undermines the use of the 2.4 GHz band for unlicensed use for the benefit of Globalstar will be scrutinized by regulators around the world. Thus, it is essential that the Commission state in clear and unambiguous language that Globalstar's use of 2473-2483.5 MHz will be on precisely the same terms and conditions as any other Part 15 user – it will be entitled to no additional rights, nor will its presence in the band impose any additional obligations on other users. These should be the fundamental premises underlying any final decision to authorize TLPS, and should be clearly and firmly announced if the Commission elects to move forward.

*B. GLOBALSTAR SHOULD NOT BE PERMITTED TO MODIFY OR MANAGE IEEE 802.11 CONSUMER DEVICES IN A MANNER THAT HAMPERS THEIR ABILITY TO COMMUNICATE WITH NON-GLOBALSTAR ACCESS POINTS USING THE 2473-2483.5 GHZ BAND.*

To assure that consumers' ability to access the unlicensed commons below 2483.5 MHz is not frustrated by Globalstar, the Commission should require Globalstar to describe in far more detail exactly how it intends to "update" the software in consumers' existing IEEE 802.11 devices to empower those devices to operate on IEEE 802.11 Channel 14 and how it will thereafter utilize network management and security techniques to control these modified devices "to prevent unauthorized use of the 2473-2495 MHz band."<sup>16</sup>

Of particular concern to Cisco is the possibility that Globalstar's software modification and/or its subsequent management of modified devices may preclude consumers from accessing the 2473-2483.5 MHz band when communicating with a Wi-Fi access point that is not part of Globalstar's network. Certainly, only a modified device that is actually communicating with a Globalstar TLPS access point should be permitted to use Globalstar's licensed spectrum at

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spectrum is not an outcome that supports U.S.-based manufacturers of unlicensed devices who are selling billions of devices into the global market.”).

<sup>16</sup> Globalstar Petition at 41-42.

2483.5-2495 MHz. However, when a modified IEEE 802.11 device is not communicating with a Globalstar TLPS access point, it should be able to utilize any of the unlicensed frequencies, including those from 2473-2483.5 MHz, subject to compliance with the Commission's rules.<sup>17</sup>

Thus, the Commission should condition any authority granted Globalstar to deploy TLPS to require that the specific software modifications to existing IEEE 802.11 devices and any network management techniques Globalstar employs will not hamper in any manner the ability of a modified consumer device to fully utilize the 2473-2483.5 MHz band for traditional Wi-Fi

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<sup>17</sup> Cisco certainly recognizes that, due to the technical limits imposed under Part 15 to protect Globalstar's MSS, IEEE 802.11 Channels 11 and 12 tend to be disabled in most consumer IEEE 802.11 devices marketed in the United States and thus the devices do not operate above 2473 MHz. *See NPRM*, 28 FCC Rcd at 15359-60 ¶ 21, 15367 ¶ 39 n.107. However, as the *NPRM* recognizes, only the spectrum above 2483.5 MHz is in the "restricted" band that is off-limits to IEEE 802.11 devices, and it is certainly possible that over time end user IEEE 802.11 devices will be developed that can operate in the 2473-2483.5 MHz band. *See id.* at 15353 ¶ 3 n.8, 15367 ¶ 41. As the Wi-Fi Alliance established in response to the Globalstar Petition, "Wi-Fi technology is developing at a rapid pace, and Wi-Fi Alliance cannot rule out the possibility that, based on decisions about filtering and/or power levels, or future technology developments, there will emerge a way for Wi-Fi to utilize 2473-2483.5 MHz or indeed some or all of Channels 12 and 13 (2457-2482 MHz)." Letter from Edgar Figueroa, President and CEO of Wi-Fi Alliance, to Marlene H. Dortch, Secretary, Federal Communications Commission, RM-11685, at 1-2 (filed May 8, 2013). The Commission can promote future innovation and spectral efficiency by not permitting Globalstar to preclude future use of the 2473-2483.5 MHz band by 802.11 devices in the United States.

In addition, Cisco notes that at the urging of the Wi-Fi Alliance, the *NPRM* has questioned whether the band-edge restrictions and unwanted emission limits in Sections 15.205 and 15.209, which were established to protect reception of Globalstar's weak satellite signals and today limit Wi-Fi use of Channels 12 and 13, should be liberalized to permit use of 2473-2483.5 MHz, subject to protection of TLPS use of the 2483.5-2495 MHz band from harmful interference. *See NPRM*, 28 FCC Rcd at 15367-68 ¶ 41. If the overly-restrictive limits were to be relaxed to the level specified in Section 15.247(c), IEEE 802.11 devices operating in Channels 12 and 13 would operate 20 dB below Globalstar's TLPS. While the *NPRM* correctly observes that those devices would not be under Globalstar's network management, Globalstar has yet to establish that its TLPS network management capabilities will play a material role in protecting Globalstar's MSS usage from TLPS interference. Given Globalstar's diminishing use of MSS (particularly in the United States), its own willingness to operate TLPS in the MSS spectrum, and the unmistakable congestion in the 2.4 GHz band, the burden must be on Globalstar to establish why it would suffer actual harm were the 2473-2483.5 MHz band made widely available for use of Channels 12 and 13. Moreover, Globalstar is in a unique position to assess the effect of increased use of the 2.4 GHz band on its operations.

communications with a non-Globalstar access point. In this manner, the Commission can assure that end users who happen to have access to Globalstar's TLPS do not find their non-Globalstar Wi-Fi communications compromised.

*C. THE COMMISSION SHOULD ADOPT THE PROPOSED POWER LIMIT FOR TLPS.*

The *NPRM* proposes to adopt a new Section 25.149(c)(4) of the Commission's Rules to specify the technical characteristics for ATC equipment that would be entitled to special TLPS treatment. Among the specific proposals advanced in the *NPRM*, the total transmit power for TLPS equipment operating in the 2483.5-2495 MHz band could not exceed 1 Watt with a peak equivalent isotropically radiated power ("EIRP") of no more than 6 dBW (4 Watts) with a minimum 6 dB bandwidth of 500 kilohertz and a maximum conducted PSD limit of 8 dBm/3 kHz.<sup>18</sup> This power limit is identical to that specified in Section 15.247 of the Commission's Rules for unlicensed operations by digitally modulated communications equipment operating in the 2400-2483.5 MHz band.

Cisco supports this proposed limit. The Commission has correctly observed that the Section 15.247 limit is appropriate "given the nature of the proposed operations, including the use of digital modulation, and the widespread use of this limit in designing Part 15 devices."<sup>19</sup> Moreover, applying the same power restrictions above 2483.5 MHz as currently apply below it will promote the ability of devices operating in the unlicensed commons to coexist with TLPS.

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<sup>18</sup> *See id.* at 15362 ¶ 28.

<sup>19</sup> *See id.*

*D. THE COMMISSION SHOULD AMEND SECTION 25.254 TO PROVIDE THAT EQUIPMENT MEETING THE TLPS STANDARD OF SECTION 25.149(C)(4) IS SUBJECT TO A LESS RESTRICTIVE LIMIT ON UNWANTED EMISSIONS.*

The *NPRM* seeks comment on whether the Commission should impose on TLPS the same limit on unwanted emissions below 2473 MHz contained within Section 15.247(d) for unlicensed devices operating in the 2.4 GHz band.<sup>20</sup> The Commission correctly recognizes that IEEE 802.11 Channel 14 is directly adjacent to Channel 11, lacking the 3 megahertz guardband that separate Channel 1 from Channel 6 and Channel 6 from Channel 11. Nonetheless, based on the successful use of Channel 14 in Japan without any special filtering, Cisco believes that the Section 15.247(d) limit on unwanted emissions will be adequate.<sup>21</sup> Thus, Cisco recommends that the Commission amend proposed Section 25.149(c)(4) to add a new subsection that incorporates the unwanted emissions limit in Section 15.247(d).

At present, Sections 25.254(a) and (b) limit ATC base stations to a maximum out-of-channel emission of  $-44.1$  dBW/30 kHz at the edge of the MSS licensee's authorized frequency assignment and restrict ATC mobile terminals to a maximum out-of-channel EIRP limit of  $-57.1$  dBW/30 kHz at the edge of the licensed MSS frequency assignment. The *NPRM* questions whether to either exempt TLPS from this requirement or modify Section 25.254 to exempt TLPS equipment.<sup>22</sup> Cisco recommends that the Commission amend Section 25.254 to add a cross-reference to the unwanted emissions limit for TLPS to be set forth in new Section 25.149(c)(4), as discussed above.

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<sup>20</sup> *See id.* at 15363 ¶ 30.

<sup>21</sup> While Globalstar has cited an intent to add passband filters to its base stations to reduce the potential for interference, that measure is only a half-step, as the existing Wi-Fi client devices that Globalstar proposes to modify to permit Channel 14 use will not have such filters and are likely to be operating in very close proximity to non-Globalstar IEEE 802.11 devices. *See* Globalstar Reply at 14. *See also NPRM*, 28 FCC Rcd at 15363 ¶ 29.

<sup>22</sup> *See NPRM*, 28 FCC Rcd at 15363 ¶ 31.

*E. THE COMMISSION SHOULD APPLY ITS STANDARD EQUIPMENT AUTHORIZATION REQUIREMENTS TO EQUIPMENT USED IN GLOBALSTAR'S TLPS.*

The *NPRM* proposes to require manufacturers of TLPS master access points and client end user equipment to certificate their equipment under Section 15.31(k) of the Rules as composite equipment subject to current Section 15.247 and proposed Section 25.149(c)(4) of the Rules.<sup>23</sup> Cisco agrees with that proposal. Under the Commission's equipment authorization rules, that is the appropriate regulatory treatment under these circumstances, and Globalstar has offered no compelling rationale for exempting manufacturers of equipment for Globalstar's service from the requirements to which every other manufacturer of IEEE 802.11-compliant equipment is subject.<sup>24</sup>

The *NPRM* solicits specific comment on Globalstar's assertion that the Commissions' existing equipment authorization rules permit manufacturers of the existing IEEE 802.11 Wi-Fi client devices to use the permissive change process to secure the necessary authority for Globalstar to make the software changes that will allow use of the 2483.5-2495 MHz band.<sup>25</sup> As

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<sup>23</sup> *See id.* at 15368 ¶ 42.

<sup>24</sup> The *NPRM* proposes to require the manufacturer of a TLPS master access point to provide Globalstar's consent to the request for equipment certification. *See id.* at 15369 ¶ 44. Cisco has no objection to the imposition of such a requirement.

<sup>25</sup> *See id.* at 15369 ¶¶ 44-45, *citing* Globalstar Petition at 42 n.105 ("Under the Commission's equipment certification rules, in order to expand the operating frequency range of existing 802.11-enabled consumer devices to include Globalstar's licensed spectrum at 2483.5-2495 MHz, the original grantees for those device models (or their authorized third-party agents) will have to submit 'permissive change' filings describing the proposed modifications. 47 C.F.R. § 2.1043.").

Globalstar has represented to the Commission that it anticipates that "most if not all TLPS access points will be newly manufactured equipment, and that these base stations along with next-generation TLPS-enabled consumer devices will receive new equipment certifications from the Commission." Globalstar Petition at 42 n.105. *See also NPRM*, 28 FCC Rcd at 15369 ¶ 44. The Commission should make clear that any TLPS master access point, whether new or a

recognized by the *NPRM*, Globalstar is wrong.<sup>26</sup> Section 2.1043 of the Commission’s Rules and KDB Publication 178919 provide clear guidance as to when a modification to a certificated device requires a new certification and when it can be the subject of a “permissive change” filing. Modifying an existing IEEE 802.11 device, certificated solely under Part 15, would not qualify for permissive change because unless a Wi-Fi client end user device has been certificated as a software defined radio (“SDR”), the grantee of a device certificated under one Commission rule part must obtain a new certification if the device is to be modified to operate under a different rule part.<sup>27</sup> Thus, the manufacturer of an existing non-SDR IEEE 802.11 client certificated under Part 15 that seeks authority for Globalstar to make software modifications to comply with Part 25 is required under the rules to secure a new certification and FCC ID.

Cisco appreciates that the Commission previously has indicated that it will consider modifying the permissive change rules in the future.<sup>28</sup> The equipment authorization process certainly can be improved, and Cisco looks forward to continuing its work with the Commission to exploring changes of general applicability. However, there is no reason for TLPS to be afforded any special status at this time. Rather than single out Globalstar for extraordinary relief, the Commission should redouble its efforts to revise KDB 178919, move forward with its consideration of the labeling rules to permit electronic labeling to ease the impact of denying

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repurposed existing IEEE 802.11 device, must obtain a new equipment certification and a new FCC ID before it can be deployed.

<sup>26</sup> *See NPRM*, 28 FCC Rcd at 15369 ¶¶ 43, 47.

<sup>27</sup> *See id.*

<sup>28</sup> *See id.* at 15370 ¶ 47, *citing* FCC Responds to Ever Increasing Applications for New Wireless Devices; Announces Agency Will Consider Ways to Enhance Equipment Authorization Program, *News Release* (rel. June 13, 2012).

permissive change status,<sup>29</sup> and take whatever steps are necessary to streamline the equipment modification process.<sup>30</sup>

*F. GLOBALSTAR SHOULD BE SOLELY RESPONSIBLE FOR ASSURING THAT ITS PROPOSED SOFTWARE MODIFICATIONS ARE PROPERLY RESTRICTED AND SHOULD BE REQUIRED TO DEMONSTRATE HOW IT INTENDS TO MEET THAT RESPONSIBILITY.*

Globalstar has represented that it “will control the availability of the software update necessary for a [IEEE] 802.11 consumer device to operate throughout the 2473-2495 MHz band and receive TLPS,” that it “will provide this software update only to device models that have been certified by the Commission to operate in this expanded frequency range,” and that the software update will be provided “only to customers who have been authenticated to receive service over its TLPS facilities.”<sup>31</sup> The Commission should make clear that, while the manufacturer is responsible for securing equipment authorization for the software modification

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<sup>29</sup> On August 6, 2012, the Telecommunications Industry Ass’n (“TIA”) submitted a petition for rulemaking proposing that the Commission modify its rules to allow “electronic labeling” of wireless devices. *See* Petition of the Telecommunications Industry Ass’n for Rulemaking, RM-11673 (filed Aug. 6, 2012). The Commission immediately sought public comment thereafter (*see* Consumer & Governmental Affairs Bureau Reference Information Center Petitions for Rulemaking Filed,” *Public Notice*, Report No. 2960 (rel. Sept. 5, 2012)), and there was substantial support from Cisco and other equipment manufacturers for the concept. *See* Comments of Cisco Systems, Inc., RM-11673 (filed Oct. 1, 2012). It appears that substantial progress has been made between staff and TIA since (*see* Letter from Brian Scarpelli, Senior Manager, Government Affairs, Telecommunications Industry Ass’n, to Dr. Rashmi Doshi, Chief, Laboratory Division, Office of Engineering and Technology, Federal Communications Commission, RM-11673 (dated Mar. 19, 2014)) and the issue should be ripe for moving forward.

<sup>30</sup> Moreover, Globalstar’s proposal for implementing TLPS is not a simple one, what with IEEE 802.11 device manufacturers being responsible for securing the equipment authorization necessary to make software changes, and with Globalstar, and perhaps even “future terrestrial partners”, responsible for controlling access to those software modifications. This approach raises a series of complicated questions regarding responsibilities and liabilities that should be addressed in a comprehensive matter, rather than on an *ad hoc* basis focused on TLPS. Setting precedent based on Globalstar’s proposal, without fully analyzing the broader implications applicable to similar situations, may yield a case of tough facts creating bad law.

<sup>31</sup> Globalstar Petition at 41-42 (citation omitted).

in the first place, Globalstar, as the licensee of the 2483.5-2495 MHz band, is solely responsible for making certain that only those IEEE 802.11 device models authorized by the Commission for TLPS actually receive the software modification, that the software modification will only be available to devices under Globalstar's operational control, and that the devices of customers who discontinue TLPS service will be returned to their pre-modified software state.<sup>32</sup>

Moreover, before the Commission authorizes TLPS, it should require Globalstar to specifically demonstrate how it intends to meet each of these requirements. The *NPRM* solicits comment on “the means that Globalstar plans to use to control the availability of software updates and prevent unauthorized modifications to certified equipment” and “how Globalstar will limit operation of equipment to parties that are authorized to use its spectrum.”<sup>33</sup> There is insufficient information in the record from Globalstar for Cisco to provide any meaningful comment. Cisco looks forward to Globalstar's response to this series of questions, and intends to reply if questions or concerns remain.

### **III. CONCLUSION.**

In short, while Cisco has no objection in principle to Globalstar's use of its MSS spectrum to address in small part the growing demand for Wi-Fi services, the Commission must make certain that Globalstar's TLPS not undermine the success story of the 2400-2483.5 MHz unlicensed commons. The 2.4 GHz band is too important, both for Wi-Fi and a wide range of

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<sup>32</sup> It should be noted that under KDB 178919, the Commission generally does not allow software modifications to be implemented by parties other than the grantee to be treated as permissive changes, except that the Commission will afford Class II permissive change status when the grantee contemplates software upgrades by service providers, so long as the filing includes “an attestation from the grantee indicating that they continue to be the responsible party to ensure compliance.” Federal Communications Commission, Office of Engineering and Technology Laboratory Division, KDB 178919, *Permissive Change Policy*, at 5-6 (dated Oct. 24, 2012). Since, in this situation, Globalstar intends to be the ultimate party responsible for compliance, that exception would not appear to be relevant.

<sup>33</sup> *NPRM*, 28 FCC Rcd at 15369 ¶ 46.

other unlicensed technologies, to be jeopardized by Globalstar's latest effort to find a business plan. Cisco looks forward to working with Globalstar, other interested parties and the Commission to assure that the goal of preserving the 2.4 GHz band commons is achieved.

Respectfully submitted,

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