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IEEE P802.18
Radio Regulatory Technical Advisory Group (RR-TAG)

Proposed Response to the Colombia ANE's Consultation on 6 GHz
Band Coexistence Study

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This document drafts a proposed response to the Colombia ANE's consultation on 6 GHz band coexistence study.

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7 Re: Colombia ANE's consultation on 6 GHz band coexistence study

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9 Dear National Spectrum Agency,

10
11 IEEE 802 LAN/MAN Standards Committee (LMSC) thanks Colombia's National Spectrum
12 Agency (ANE) for issuing the call for comments on "Consultation on 6 GHz Band Coexistence
13 Study" and for the opportunity to provide feedback.

14
15 IEEE 802 LMSC is a leading consensus-based open standards development committee for
16 networking standards that are used by industry globally. It produces standards for networking
17 devices, including wired and wireless local area networks ("LANs" and "WLANs"), wireless
18 specialty networks ("WSNs"), wireless metropolitan area networks ("Wireless MANs"), and
19 wireless regional area networks ("WRANs"). Technologies produced by implementers of our
20 standards are a critical element for all networked applications today.

21
22 IEEE 802 LMSC is a committee of the IEEE Standards Association and of IEEE Technical
23 Activities, two of the Major Organizational Units of the IEEE. IEEE has about 400,000 members
24 in over 160 countries and its core purpose is to foster technological innovation and excellence for
25 the benefit of humanity. IEEE is also a major accredited standards development organization
26 whose standards are recognized world-wide. In submitting this document, IEEE 802 LMSC
27 acknowledges and respects that other components of IEEE Organizational Units may have
28 perspectives that differ from, or compete with, those of IEEE 802 LMSC. Therefore, this
29 submission should not be construed as representing the views of IEEE as a whole¹.

30
31 IEEE 802 LMSC follows Colombia's ANE regulatory activities regarding radio local area network
32 (RLAN) and strongly supports ANE proceedings on enabling Standard Power (SP) for spectrum
33 sharing with fixed communication systems operated in 5925 MHz to 7125 MHz.

34
35 Please find below the IEEE 802 LMSC's comments on this consultation.

36
37 **General Comments**

38 IEEE 802 LMSC recognizes ANE's consideration of a non-AFC based co-existence mechanism
39 based on pre-determined exclusion zones while also considering the AFC based solution.
40 Information related to availability of incumbent services database, required timeline of enablement
41 and details of studies are not available to IEEE 802 LMSC. Considering that, while we respect
42 the ANE's proactive co-existence approach based on the studies, we recommend ANE to also
43 consider harmonization with other solutions globally to the maximum extent possible.

44
45 Recognizing ANE's effort to enable Wi-Fi outdoor operation, IEEE 802 LMSC would like to
46 emphasize the importance of Very Low Power (VLP) operation to enable outdoor (and indoor)
47 peer-to-peer communications. Enabling unrestricted VLP at a much lower power level than SP is
48 critical to enabling complementary use cases and industries to SP. IEEE 802 LMSC recommends
49 to ANE to authorize the VLP mode harmonized with other regions such as Europe, Asia, and

¹ This document solely represents the views of IEEE 802 LMSC and does not necessarily represent a position of either the IEEE, the IEEE Standards Association, or IEEE Technical Activities.

50 Africa at a maximum transmit power of 14 dBm and a maximum power spectral density (PSD) of
51 1 dBm/MHz EIRP.

52

53 **Question 8:** Do you consider that the coexistence scenarios included in section 3 of the published
54 document fully reflect the current use of the 6 GHz frequency band in Colombia? If not, justify
55 your answer.

56 **Answer:** In the USA, Canada, and other regions and countries, co-existence studies and analysis
57 for the SP mode in the 6 GHz band has been primarily focusing on co-existence with Fixed Satellite
58 Services (FSS) and Fixed Services (FS), which are the focus of this published document. In
59 addition to these two classes of incumbent services, incumbent Mobile Services, such as Broadcast
60 or TV Relay services, have been also taken into the account by the other regulatory authorities in
61 the decision for the frequency ranges of the SP mode in the 6 GHz band.

62

63 **Question 9:** Do you consider it appropriate to allow the operation of wireless access systems
64 under the modality of free use of the radio spectrum outdoors in the entire 6 GHz frequency band?
65 If not, justify your answer.

66 **Answer:** IEEE 802 LMSC supports authorization of the SP mode in the entire 6 GHz band (5925
67 MHz - 7125MHz). In order to protect incumbent FS links, segments of the spectrum will have to
68 be excluded depending on the locations. In particular, this would be the case in urban areas or
69 areas with concentration of these fixed links. Assuming that no special consideration is needed
70 for incumbent Mobile Services, authorization of the entire 6 GHz band for the SP mode enables
71 an effective deployment of SP operation when the available spectrum and the number of wide
72 channel bandwidth widths of 80 MHz/160 MHz and 320 MHz are maximized in various locations.

73

74 IEEE 802 LMSC believes that the first wave of SP deployments, in the regions that already
75 authorized the mode, will be indoor to improve coverage and capacity performance of the indoor
76 networks covering approximately 90% of Wi-Fi usage. IEEE 802 LMSC believes that ANE
77 should also authorize operation of the SP mode indoors. Indoor SP operation can be enabled by
78 taking into account Building Entry Loss (BEL) for Indoor Access Points (APs) for a proper
79 spectrum availability calculation.

80

81 **Question 10:** Do you consider it appropriate to allow the operation of wireless access systems
82 under the modality of free use of the radio spectrum outdoors in the 6 GHz frequency band with a
83 maximum Equivalent Isotropic Radiated Power (EIRP) of 36 dBm and power spectral density of
84 23 dBm/MHz, as identified in the public consultation document in section 1.1? If not, justify your
85 answer.

86 **Answer:** Yes, IEEE 802 LMSC supports authorizing SP mode with a maximum EIRP power level
87 of 36 dBm for APs and 30 dBm for Clients. IEEE 802 LMSC also supports a maximum PSD of
88 23 dBm/MHz EIRP for APs and 17 dBm/MHz EIRP for Clients. Allowing these maximum
89 transmit power levels harmonizes product requirements with those of other regions and countries
90 such as the USA and Canada, and promotes global harmonization of the devices.

91

92 **Question 11:** Do you consider that a 40 MHz guard band between wireless access systems under
93 the modality of free use of the radio spectrum outdoors and fixed point-to-point radio links is
94 adequate to ensure coexistence without harmful interference on fixed radio links in the band of 6
95 GHz frequencies, as mentioned in the public consultation document in section 3.1? If not, justify
96 your answer.

97 **Answer:** IEEE 802 LMSC understands that the 40 MHz guard band is calculated considering no
98 degradation of incumbent FS link performance when a Wi-Fi system is operated at a maximum

99 transmit power of 36 dBm. For a more optimized utilization of the spectrum, Wi-Fi systems can
100 operate at lower power level down to 21 dBm that can be automated and calculated when an AFC
101 system is utilized.

102

103 Note that an AFC system can also perform adjacent channel protection calculations which would
104 enable coexistence with Wi-Fi systems operating in adjacent frequencies to the licensed fixed
105 links.

106

107 **Question 12:** Do you consider that a spatial separation of 100 m between the stations of wireless
108 access systems under the modality of free use of the radio spectrum outdoors with omnidirectional
109 antennas and the stations of fixed point-to-point radio links, operating with a lower guard band at
110 40 MHz, is adequate to ensure coexistence without harmful interference on fixed radio links in the
111 6 GHz frequency band, as mentioned in the public consultation document in section 3.1? If not,
112 justify your answer.

113 **Answer:** IEEE 802 LMSC needs detailed information about the simulation/study assumptions to
114 provide comments.

115

116 **Question 13:** Do you consider that a deviation of at least 10 degree between the axes of the
117 antennas of the stations of the wireless access systems under the modality of free use of the radio
118 spectrum outdoors with directional antennas and the stations of the fixed point-to-point radio links,
119 operating with a guard band less than 40 MHz, is adequate to ensure coexistence without harmful
120 interference on fixed radio links in the 6 GHz frequency band, as mentioned in the public
121 consultation document in section 3.1? If not, justify your answer.

122 **Answer:** IEEE 802 LMSC needs detailed information about the simulation/study assumptions to
123 provide comments.

124

125 IEEE 802 LMSC would like to bring to the attention of ANE that Wi-Fi Alliance AFC System to
126 AFC Device Interface Specification² supports incorporating AFC Devices (SP APs) directional
127 antenna characteristics in the calculation of frequency availability through Vendor Extension
128 messaging. For more details, please refer to the Specification.

129

130 **Question 14:** Do you consider that additional restrictions to those specified in questions 9 to 13
131 should be defined to allow the operation of wireless access systems under the modality of free use
132 of the radio spectrum outdoors in the 6 GHz frequency band? If yes, justify your answer.

133 **Answer:** No comments.

134

135 **Question 15:** Do you consider that wireless access systems under the modality of free use of the
136 radio spectrum outdoors can coexist with fixed satellite radio links (Earth-space) in the 6 GHz
137 frequency band without any type of restriction? If not, justify your answer.

138 **Answer:** IEEE 802 LMSC agrees with the results of the study that no special protection is required
139 with regards to co-existence with Uplink FSS. IEEE 802 LMSC also supports harmonizing with
140 other regulatory bodies, such as the USA and Canada, to limit the radiation to 21 dBm at elevation
141 above 30 degrees for outdoor APs.

142

143 **Question 16:** Taking into account the future distributed interference control characteristics that
144 the Wi-Fi 7 standard will have, do you consider it necessary to implement an Automatic Frequency
145 Coordination (AFC) system to allow coexistence between wireless access systems under the

² <https://www.wi-fi.org/file/afc-specification-and-test-plans>

146 modality of free use of the radio spectrum outdoors and fixed point-to-point radio links in the 6
147 GHz frequency band? Justify your answer.

148 **Answer:** IEEE 802 LMSC understands that ANE studies consider the pre-determined exclusion
149 zone-based co-existence method as a solution for enabling SP mode. IEEE 802 LMSC believes
150 that SP operation under supervision of an AFC System can address optimization of guard bands
151 and accommodate SP APs with directional antennas. In addition, AFC based solutions are scalable
152 as AFC Systems can be automatically updated as incumbent FS links are added or otherwise
153 modified. Of course, AFC based solutions require availability of a reliable incumbent database.

154

155 Having said that, IEEE 802 LMSC would like to comment on applications of AFC Systems as
156 related to Wi-Fi 7. Two relevant features supported in Wi-Fi 7 are 320 MHz channels and Static
157 Puncturing. Wi-Fi Alliance is currently working on updating AFC Compliance specifications³ to
158 include these two features. With regards to Static Puncturing, although the feature enables
159 utilization of a more efficient larger channel bandwidth in the presence of incumbent channels,
160 Static Puncturing is not required to utilize spectrum adjacent to incumbent channels. In Wi-Fi 6E,
161 this is accomplished through the use of smaller channels.

162

163 **Question 17:** Do you consider that keeping a record of the devices of the wireless access systems
164 under the modality of free use of the radio spectrum outdoors to know their location with respect
165 to the fixed point-to-point radio links is necessary to ensure the correct coexistence between both
166 systems in the 6 GHz frequency band while an AFC system is implemented or while Wi-Fi7
167 devices hit the market? Justify your answer.

168 **Answer:** IEEE 802 LMSC believes that in either approach, using pre-determined exclusion zones
169 or an AFC based solution, the registration information is needed from a regulatory and operational
170 perspective.

171

172 **Conclusion**

173

174 IEEE 802 LMSC supports ANE's expansion of the 6 GHz regulations enabling SP for spectrum
175 sharing with fixed communication systems. We respectfully request ANE to initiate regulations
176 for VLP operation and consider our comments listed in this response for SP mode. We hope that
177 the new regulation will be enacted in a timely manner.

178

179 Respectfully submitted

180

181 By: /ss/.

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³ <https://www.wi-fi.org/file/afc-specification-and-test-plans>