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Radio Regulatory Technical Advisory Group (RR-TAG)

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| 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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Electronic filing January TBD, 2024

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

Dear National Spectrum Agency,

IEEE 802 LAN/MAN Standards Committee (LMSC) thanks Colombia’s National Spectrum Agency (ANE) for issuing the call for comments on “Consultation on 6 GHz Band Coexistence Study” and for the opportunity to provide feedback.

IEEE 802 LMSC is a leading consensus-based industry standards body, producing standards for wireless networking devices, including wireless local area networks (“WLANs”), wireless specialty networks (“WSNs”), wireless metropolitan area networks (“Wireless MANs”), and wireless regional area networks (“WRANs”). We also produce standards for wired Ethernet networks, and technologies produced by implementers of our standards are critical for all networked applications today.

IEEE 802 LMSC is a committee of the IEEE Standards Association and Technical Activities, two of the Major Organizational Units of the Institute of Electrical and Electronics Engineers (IEEE). IEEE has about 400,000 members in over 160 countries. IEEE’s core purpose is to foster technological innovation and excellence for the benefit of humanity. In submitting this document, IEEE 802 LMSC acknowledges and respects that other components of IEEE Organizational Units may have perspectives that differ from, or compete with, those of IEEE 802 LMSC. Therefore, this submission should not be construed as representing the views of IEEE as a whole[[1]](#footnote-1).

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

Please find below the IEEE 802 LMSC’s comments on this consultation 6 GHz band coexistence study.

**General Comments**

Recognizing ANE’s effort to enable Wi-Fi outdoor operation, IEEE 802 LMSC would like to emphasize on the importance of Very Low Power (VLP) to enable outdoor (and indoor) peer-to-peer communications. Enabling unrestricted VLP at much lower power level than Standard Power, is critical in enabling complementing use-cases and industries to SP. IEEE 802 LMSC recommends to ANE to authorize VLP mode harmonized with other regions such as Europe, Asia and Africa at maximum transmit power of 14 dBm and maximum PSD of 1 dBm/MHz EiRP.

**Questions 1 to 7:** [Author’s information TBD]

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

**Answer:** In US, Canada and other regions, co-existence studies and analysis for SP mode in the 6GHz band has been primarily focusing on co-existence with Fixed Satellite Services (FSS) and Fixed Services (FS). In addition to these two classes of incumbent services, incumbent Mobile Services, such as Broadcast or TV Relay services, has been also taken into the account in the decision for the frequency ranges of SP mode in the 6GHz band.

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

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

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

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

**Answer:** Yes, IEEE 802 LMSC supports authorizing SP mode with maximum EiRP power level of 36 dBm for APs and 30 dBm for the Clients. IEEE 802 LMSC also supports maximum Power Spectral Density (PSD) of 23 dBm /MHz EiRP and 17 dBm/MHz EiRP for the Clients. Allowing these maximum transmit power levels harmonizes product requirements with those of other countries and regions such as US and Canada and promote global harmonization of the devices.

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

**Answer:** IEEE 802 LMSC understands that the 40MHz guard band is calculated considering no degradation of incumbent FS link performance when Wi-Fi system is operation at max Tx power of 36 dBm. For a more optimized utilization of the spectrum, Wi-Fi system can operate at lower power level down to 21 dBm that can be automated and calculated when AFC system is utilized.

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

**Answer:** [We need detailed information about the simulation/study assumptions to provide any comments.]

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

**Answer:** [We need detailed information about the simulation/study assumptions to provide any comments.]

IEEE 802 LMSC would like to bring to the attention of ANE that Wi-Fi Alliance AFC System to AFC Device Interface Specification[[2]](#footnote-2) supports incorporating AFC Devices (SP APs) directional antenna in calculation of frequency availability through Vendor Extension messaging. For more details, please refer to AFC System to AFC Device Interface Specification.

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

**Answer:** No comments

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

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

**Question 16:** Taking into account the future distributed interference control characteristics that the Wi-Fi 7 standard will have, do you consider it necessary to implement an Automatic Frequency Coordination (AFC) system to allow coexistence between wireless access systems under the modality of free use of the radio spectrum outdoors and fixed point-to-point radio links in the 6 GHz frequency band? Justify your answer.

**Answer:** IEEE 802 LMSC understands that ANE studies consider the exclusion-based method as an interim and transitional solution for enabling Standard Power mode. IEEE 802 LMSC believes that Standard Power operation under supervision of the AFC System that can address optimization of guard bands and SP APs with directional antenna. In addition, AFC Systems are scalable and will be automatically updated as incumbent FS links are added or otherwise modified. Of course, AFC based solutions require availability of a reliable incumbent database.

Having said that, IEEE 802 LMSC would like to comment on applications of AFC Systems as related to Wi-Fi 7. Two relevant features supported in Wi-Fi 7 are 320 MHz channels and Static Puncturing. Wi-Fi Alliance is currently working on updating AFC Compliance specifications to include the two features. With regards to Static Puncturing, although the feature enables utilization of more efficient larger channel bandwidth in presence of incumbent channels, Static Puncturing is not required to utilize spectrum around incumbent channels. In Wi-Fi 6E, this is done through usage of smaller channels.

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

**Answer:** [This seems to be a question about forward compatibility when an exclusion zone based SP is enabled first transitioning to AFC System. Answer needs discussion.]

**Conclusion**

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

Respectfully submitted

By: /ss/.

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References:

[1] [TBD]

1. This document solely represents the views of IEEE 802 LMSC and does not necessarily represent a position of either the IEEE or the IEEE Standards Association. [↑](#footnote-ref-1)
2. <https://www.wi-fi.org/file/afc-specification-and-test-plans> [↑](#footnote-ref-2)