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

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| Proposed input to the CEPT public consultation of the draft ECC Report 355 on OOB limits for VLP devices in the 6 GHz band |
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This document drafts a proposed input to the CEPT public consultation of the draft ECC Report 355 “Measurement-based compatibility studies assessing interference from Very Low Power (VLP) Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) operating in 5945-6425 MHz to Communication Based Train Control (CBTC) systems operating in 5915-5935 MHz

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Re: CEPT public consultation on draft ECC Report 355

Dear xxxx,

IEEE 802 LAN/MAN Standards Committee (LMSC) thanks CEPT for the opportunity to comments on the draft version of the ECC Report 355 “Measurement-based compatibility studies assessing interference from Very Low Power (VLP) Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) operating in 5945 MHz to 6425 MHz to Communication Based Train Control (CBTC) systems operating in 5915 MHz to 5935 MHz”.

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Please find below the IEEE 802 LMSC’s comments on this public consultation.

**General and Summary Comments**

IEEE 802 LMSC closely follows CEPT regulatory activities regarding radio local area network (RLAN) and strongly supports the relaxation of the out-of-band emissions of Very Low Power (VLP) RLAN devices operating in the band above 5945 MHz in the band below 5935 MHz to -37dBm/MHz without any additional mitigation techniques.

IEEE 802 LMSC recognizes that the draft ECC Report 355 delivers the required technical basis for the relaxation without harmfully interfering with the Communication Based Train Control (CBTC) systems to be protected.

This relaxation of the OOB limits in the band below 5935 MHz from -45dBm/MHz to -37dBm/MHz without additional mitigation techniques will allow for a world-wide harmonization of the device implementations for VLP devices in the 6 GHz band.

**Additional redundancy capabilities of IEEE 802.11a based CBTC systems**

The CBTC systems considered in draft ECC Report are based on IEEE 802.11a technology operating in the frequency range of 5915 MHz to 5935 MHz using a 5 MHz channel bandwidth. The CBTC systems operates in two redundant channels and deploys a dual receiver antenna for both channels.

In addition to these considered redundancy methods the considered CBTC systems using message repetition based on the IEEE 802.11a protocol which has not been considered in the statistical calculation. This operation is described in ETSI TR 103 580 V1.1.1[[2]](#footnote-2):

* "In addition, redundancy and several repetitions of each message are used to ensure the required level of transmission availability. With this system, **application data are sent as unicast messages** to/from each train."

To reduce the potential delay of caused by the repetition the channel load of the system is kept well below the critical limits as stated in ETSI TR 103 580 V1.1.12:

* „In order to balance the CSMA/CA drawbacks (in particular collisions due to the hidden node effect), the **channel load during operation is kept well below the maximum limits possible in a CSMA/CA system**."

This message repetition can significantly improve the interference robustness of the system even in a potential degraded mode where only a single channel is available.

**Optimization potential of the CBTC systems described in draft ECC Report 355**

To further improve the robustness of the CBTC systems again any potential co-channel and adjacent channel interference several system improvements could be performed.

At critical positions in the Urban Rail network, like train platforms, the access point density can be increased and thus the received signal strength can be improved. In addition, redundant access point could be installed at this critical position to take over the operation in case of a access point failure.

The antennas of the train unit (TU) as depicted in the draft ECC Report 355 could be shielded or installed at the outside of the passenger wagon increasing the coupling loss between any potential interferer inside the wagon and the TU receiver.

These optimizations would reduce the probability of a degraded mode and the signal reliability.

**Network simulations in support of the draft findings**

The basic findings of the interference probability included in the draft ECC Report 355 are based on simple calculations using different single event probabilities. A more detailed analyses using a network simulation could support the further relaxation of the OOB requirements and the optimization if the CBTC system.

**Conclusion**

IEEE 802 LMSC strongly supports the relaxation of the out-of-band emissions of Very Low Power (VLP) RLAN devices operating in the band above 5945 MHz in the band below 5935 MHz to -37dBm/MHz without any additional mitigation techniques. We respectfully request CEPT to consider our comments listed in this response. We hope that the regulation update will be enacted in a timely manner.

Respectfully submitted

By: /ss/.

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IEEE 802 LAN/MAN Standards Committee Chairman

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. ETSI TR 103 580V1.1.1 (2019-08): “Urban Rail ITS and Road ITS applications in the 5,9 GHz band; Investigations for the shared use of spectrum” [↑](#footnote-ref-2)