
Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: Motivation of a letter to IEC TC 76

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Re: N/A

Abstract: I elucidate the current ‘limbo’ situation for VLC with lighting LEDs, in which the LEDs utilised are covered by two radiation safety standards. This outline provides the background for a proposed letter to the IEC, asking them to consider removing optical wireless communications with LEDs from the laser standard IEC 60825-12 (see the letter draft 15-08-0673-00-0vlc).

Purpose: Helping the 802.15 to ensure unambiguous radiation standards on which a future VLC standard has to build.

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Motivation of a letter to IEC TC 76

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Objective

Explain historical and factual background
on which my proposed letter to IEC TC
76 is based [15-08-0673-00-0vlc]

Why here, why now?

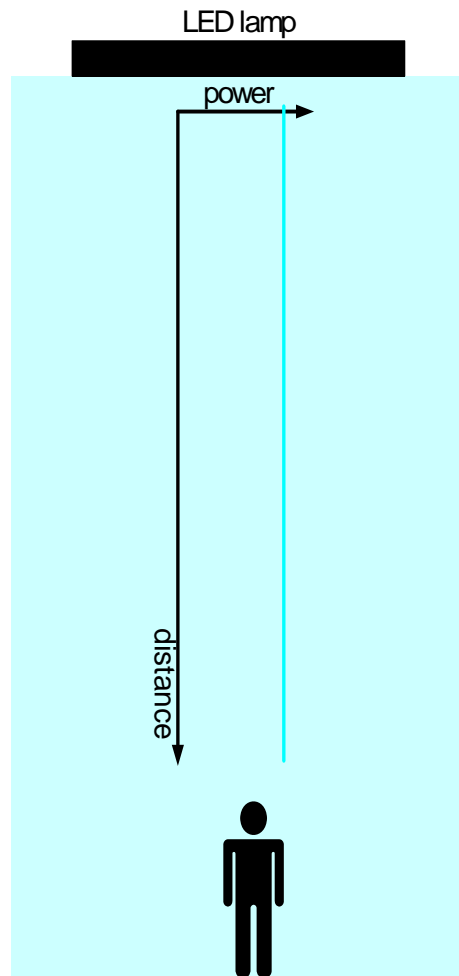
- IEEE 802.15 VLC standard will include scenarios with lighting
- LEDs high-potential candidates: provide necessary luminance and modulation bandwidth
- LEDs currently covered by two radiation safety standards of somewhat contradicting philosophy



Historical background and suggested action

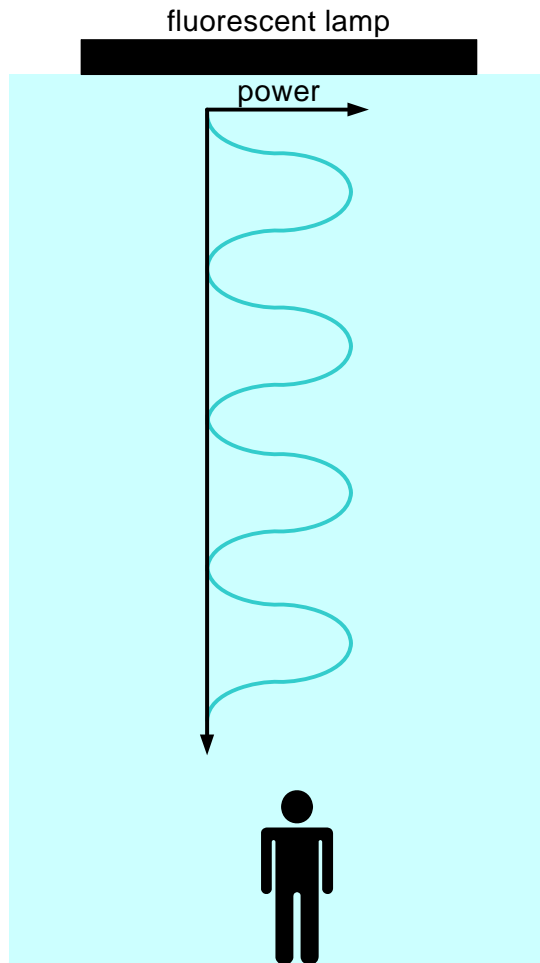
- 1993-2007: photo-biological safety aspects of LEDs covered by laser-safety standard IEC 60825
- Since 2007 LEDs in lighting/signalling scenarios covered by IEC 62471 ('lamps'). [15-08-0523-03-0vlc]
- **But:** LEDs in wireless communications still covered by laser-safety standard IEC 60825-12 (free-space optics)
- Motion by Siemens at IEC TC 76 meeting in Nov 2007: Exclude LEDs from IEC 60825-12 and make IEC 62471 only pertinent standard
 - Status: No objections by chair Dr. Tozer
 - **But:** No action taken since then
 - **Suggestion:** Ask IEC to consider complete withdrawal of LEDs from IEC 60825-12

Elucidating the limbo: LED lamp



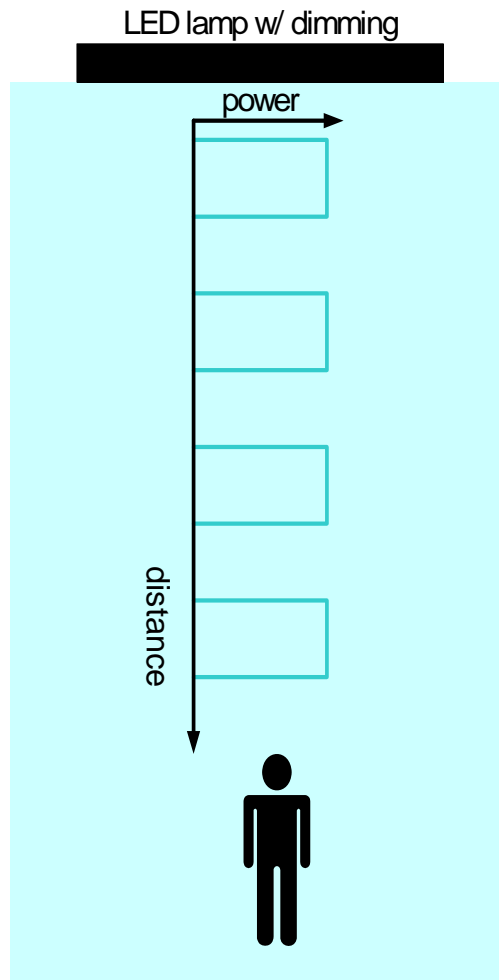
- Scenario: Room lighting w/ LED lamp, no modulation
- Relevant safety standard: IEC 62471

Elucidating the limbo: fluorescent lighting



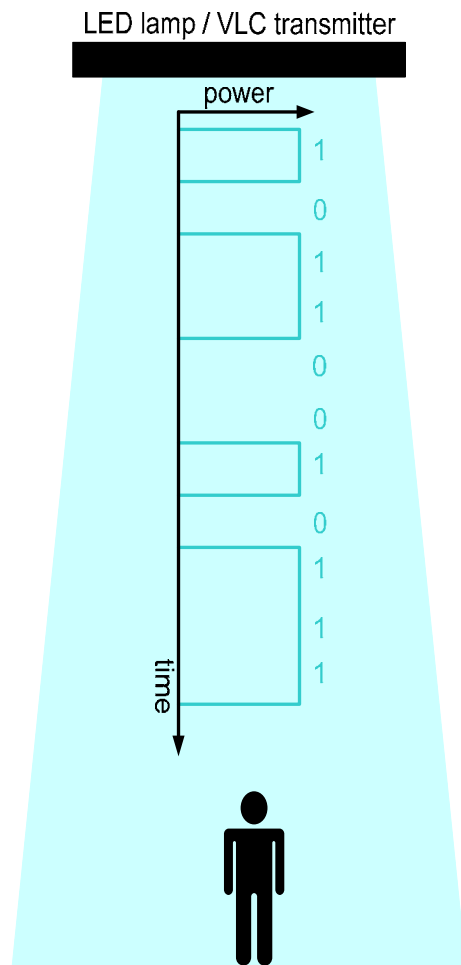
- Scenario: Room lighting with fluorescent lamp; inherent modulation
- Relevant safety standard: IEC 62471

Elucidating the limbo: LED lamp dimmed w/ PWM modulation



- Scenario: Room lighting with LED lamp; PWM dimming
- Relevant safety standard: IEC 62471

Elucidating the limbo: LED for simultaneous lighting and OOK VLC

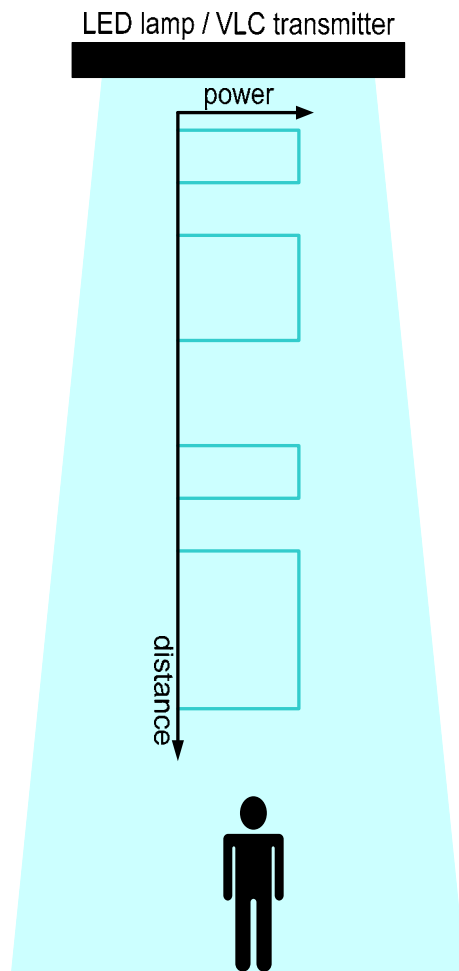


- Scenario: Room lighting and VLC with LED lamp; OOK modulation
- Relevant safety standard:

- IEC 60825-12
- IEC 62471 (?)



Elucidating the limbo: LED for simultaneous lighting and PWM VLC



- Scenario: Room lighting and VLC with LED lamp; PWM modulation
- Relevant safety standard:

- IEC 60825-12
- IEC 62471 (?)



Rhetorical Question

Does anybody see a problem with this?

Thank you for your attention!

Let's discuss the letter draft!

Appendix

Treatment of pulsed lamps in IEC 62471

“Pulsed lamp shall apply to a single pulse and to any group of pulses within 0.25 second (aversion response). The risk group determination of the pulsed lamp shall be made as follows:

- For single pulsed lamps, a lamp whose radiant exposure is below the EL shall be classified as belonging to the Exempt Group.
- For repetitive pulsed lamps, a lamp whose radiant exposure is below the EL shall be classified using the Continuous wave lamp risk criteria; Risk Group 1, Risk Group 2.
- For repetitive pulsed lamps, a lamp whose radiant exposure exceeds Risk Group 2 shall be classified as belonging to Risk Group 3 (High Risk).” [IEEE 15-08-0653-00-0vlc]