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Subject: California flicker standard

Dear All,

I responded earlier with public comments on the proposed flicker standards in California, suggesting that the NEMA 77 standard using SVM combined with Pst could be a viable interim metric. It had the value of being a standard the lighting industry was willing to adopt, and since I have traveled for over a month with a flicker meter in my backpack, measurements of SVM seemed to coincide with my visual perception of flicker (i.e. stroboscopic effect). I would like to modify that stance. In the last two weeks I have seen and measured several light sources that I find visibly distracting even though their SVM values are close to 1. Furthermore, I have now seen a product with very minor light modulation characteristics that I consider very acceptable, with an SVM value of 1.6. What this tells me is that the SVM metric is ONLY useful for predicting the stroboscopic effect when a subject's eyes are focused on a single area. If the subject's eyes are instead going through a normal saccade or the eyes or head are scanning across a page or desk or room, the artifact of flicker that is making the modulation visible to me is actually the phantom array effect. That is, the phantom array effect is making the stroboscopic effect visible. The point is that SVM as a metric will not predict visibility of flicker from relative motion of the eyes to the light source or the lighted object.

Now, I know the rest of you are saying, "Duh". But this is the first time it has dawned on me that a metric for stroboscopic effect is pretty useless in isolation. We need a metric for phantom array effect to cover the same frequencies.

I'm in a quandary how to respond to this for the state of California's regulations, plus it's too late to correct my earlier comment.

- SVM and Pst together are incomplete and will not address higher frequency flicker (such as 400 Hz).
- The existing California flicker standard only addresses frequencies up to 200 Hz, and only prevents the worst of flicker.
- The IEEE P1789 standard is too conservative in places. I've now seen 15% flicker at 100 Hz (incandescent lamps in Europe) and can't detect any flicker. Furthermore, the IEEE standard doesn't take duty cycle into account, and 1250 Hz is visible through the phantom array effect at 100% flicker when the duty cycle is extremely low (below 10%).

Is there anyone besides Philips doing the necessary human factors research? What can I do to help get rid of flicker? I may as well put this ridiculous personal sensitivity to flicker to good use.

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