DOCKETED

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Document Title:	Arnold Wilkins Comment on Proposed 2019 Standards
Description:	Corrected version of a comment submitted to staff on 3/4/2018.
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Organization:	Wilkins, Arnold J
Submitter Role:	Commission Staff
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From: Wilkins, Arnold J [mailto:arnold@essex.ac.uk]
Sent: Tuesday, March 06, 2018 1:55 AM
To: Ownby, Adrian@Energy
Subject: Re: Docket No. 17-BSTD-02

Dear Adrian
Thanks.
Your help in submitting this against the appropriate docket number would be appreciated.
I have noticed errors in grammar, corrected in the version below.
Best wishes
Arnold

I refer to the recent submission from Philips.

I would like to draw attention to some unfortunate misconceptions in the submission. The following is a quotation:

"(1)

2.4.5

static observer

observer who does not move her / his eye(s)

Note 1 to entry: Only large eye movements (saccades) fall under this

definition. An observer that only does involuntary micro-saccades is

considered static.

The definition allows for the presence of some eye motion, and therefore

some phantom array effect. By the way, if eye motion is inevitable as the

commenters suggest, then it was also happening during the experimentation

used to develop the SVM metric, and was accounted for implicitly (at least

the small micro-saccades mentioned in the definition)."

(2) "there is no evidence that phantom array is more serious than

stroboscopic effect or flicker."

Response to these statements.

(1) Eye movement is indeed continuous and unavoidable, but the nature of the eye movements during the experimentation used to develop the SVM metric was atypical because observers were following a moving target. The eye movements involved will have been those of smooth pursuit with small catch-up saccades. Phantom array will not tend to occur with small saccades or smooth pursuit movement because the eye velocity is low, and the duration brief. The movements that track a moving target are qualitatively different from the large, high velocity saccades that give rise to the phantom array. It is not therefore reasonable to suppose that any SVM metric is sufficient for phantom array because the nature of the eye movements involved is so different.

The SVM cannot predict the occurrence of the phantom array.

(2) The phantom array has the potential to occur with every large (fast) saccade, regardless of movements of objects. It is therefore ubiquitous. In this sense it is undoubtedly more serious than the stroboscopic effect, which occurs only with moving targets. The phantom array is known to be annoying and distracting, and to this extent is likely to interfere with visual performance.

The phantom array is indeed more serious than the stroboscopic effect.

The objection seems to be that lighting with low standards is acceptable in the market place and therefore generally acceptable. This is not reasonable. The marketplace continues to accept magnetic fluorescent ballasts because they are cheaper to purchase (though more expensive to run). The industry has continued to supply these ballasts for the 20 years since the original demonstration that the ballasts are injurious to health (Wilkins et al 1989). As a

result 80% of fluorescent lighting in British schools is of a type that causes headaches (Winterbottom and Wilkins, 2009). This is not an acceptable situation.

What is acceptable or not cannot be left simply to the market. Some oversight from consumers'representatives is clearly necessary.

Reference

Wilkins, A.J., Nimmo-Smith, I.M., Slater, A. and Bedocs, L. (1989) Fluorescent lighting, headaches and eye-strain. Lighting Research and Technology, 21(1), 11-18.

Winterbottom, M. and Wilkins, A.J. (2009). Lighting and discomfort in the classroom. *Journal of Environmental Psychology*, 29, 63-75.