



California Energy Commission

DOCKETED

14-BSTD-01

TN 74229

JAN 02 2015

January 2, 2015

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 14-BSTD-01
1516 Ninth Street
Sacramento, CA 95814-5512

Dear Commission Staff,

I am writing to formally recommend that the CEC, in docket no. 14-BSTD-01, remove or revise section 130.1(d).2.D.i of Title 24. This section currently states, “*Photosensors shall be located so that they are not readily accessible to unauthorized personnel, and the location where calibration adjustments are made to automatic daylighting controls shall not be readily accessible to unauthorized personnel.*”

While I recognize the good intentions of this statute (i.e. to increase reliability of daylighting harvesting energy savings by making it harder for occupants to circumvent these systems), I believe that it does more harm than good by placing unnecessary and significant limits on the types of creative solutions that manufacturers can implement to improve daylight harvesting.

The problem of occupants disabling daylight harvesting systems is real. By some accounts, 50% of daylight harvesting systems are disabled or circumvented by occupants. But this is not a sign that occupants do not want daylight harvesting systems – it is a sign that today’s daylight harvesting systems simply do not respond to the needs of occupants. With a prescriptive requirement that dictates how daylight harvesting systems must be designed, the CEC may actually be making the problem worse: this requirement makes it harder to design novel daylighting harvesting systems that respond to the needs of occupants, thus making it more likely that occupants will circumvent these systems. If a daylighting harvesting system is not working for building occupants, they will likely still circumvent that system regardless of the location of the photosensor and calibration adjustments.

It is my position that one of the primary reasons that daylight harvesting systems have been generally poorly received is because they are measuring light levels at the wrong place. They are measuring light levels at the ceiling to try to estimate light levels at the workstation. Unfortunately, light levels at the ceiling vary widely and non-linearly from levels at the workstation as light levels change at various times of day and various times of the year. Consequently it is very difficult to develop control algorithms that consistently provide appropriate light levels at the workstation (e.g. where the occupant

actually experiences light) with ceiling mounted light sensors. I have solved this problem by developing a novel approach that places a light sensor at the work plane – it is placed on the top of a task lamp and wirelessly communicates light levels to overhead luminaires (US Patent # 8,536,505). Unfortunately this placement appears to run afoul of the requirements of section 130.1(d).2.D.i.

It is also my position that daylight harvesting systems should be *more responsive* to occupant needs, not *less responsive* to them. Section 130.1(d).2.D.i mandates placing controls for calibration adjustments in areas that are inaccessible to occupants.

Consequently, when systems are poorly calibrated (or stop performing adequately when the seasons change and light levels and angles change from those present when the system was originally calibrated/commissioned), occupants have no recourse. One option they do have at this point is to get on a chair or a ladder and tape over the daylight sensor on the ceiling to ensure that they at least have adequate light at all times, negating all daylight harvesting energy savings in the process. I have solved this problem both by an improved sensor location and by including a user interface that allows occupants to individually set and adjust their desired workplane light levels. Unfortunately this feature may also run contrary to the requirements of section 130.1(d).2.D.i.

Through the Energy Innovations Smart Grant (EISG) program, the CEC has provided me \$95,000 to prototype this novel system. The result of this 14-month project (completed in early 2014) was four successful “task ambient daylighting” prototypes. In the October 2014 Independent Assessment Report prepared by EISG team for the CEC’s evaluation of this project, the Program Administrator’s first recommendation was to “Pursue regulatory acceptance of this user-controllable system under Title 24.”

The CEC has recently doubled-down on this investment funding the further development of this technology through their EPIC program, in which they plan provide an additional \$275,000 to fund the additional refinement and field testing of this system. Yet, this system is likely to be deemed “illegal” under the current Title 24 because it does not adhere to section 130.1(d).2.D.i.

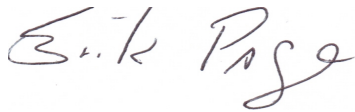
I have had talks with several major lighting controls manufacturers about licensing the technology I have developed. One leading manufacturer was initially extremely enthusiastic about licensing this technology. As talks progressed, this company’s enthusiasm waned for one simple reason: California was their most important market for daylight harvesting systems and they did not feel that this technology would comply with section 130.1(d).2.D.i of Title 24.

The 2013 Title 24 standards made bold and aggressive strides in promoting daylight harvesting technologies, recognizing the great potential of they offer to helping California meet its aggressive energy savings goals. I strongly recommend that the CEC consider modifying these requirements in the current code review cycle to address the shortcomings of section 130.1(d).2.D.i discussed above. **Specifically, I recommend removing limitations on the location and accessibility of photosensors and user input settings for daylight harvesting control systems.** Removing this regulatory burden would allow new technology to be among the options California consumers could choose

for daylighting harvesting. It would also allow other manufacturers increased freedom to pursue solutions what has been should to be a surprisingly difficult engineering challenge – developing daylight harvesting systems that reliably work year-round without regular re-commissioning. It is my strongly held belief that removing the current requirements in section 130.1(d).2.D.i will move California closer to realizing the full energy savings potential offered by daylight harvesting technologies.

Thank you for this opportunity to provide input in revisions to Title 24. If you need any more information, please do not hesitate to ask.

Sincerely,

A handwritten signature in cursive script that reads "Erik Page".

Erik Page
President
Erik Page & Associates, Inc.
34 Buena Vista Ave
Fairfax, CA 94930
(415) 448-6575
erik@erikpage.com