



Memo

To: California Energy Commission
From: Lyn Gomes, P.E., CLCATT, LEED AP
kW Engineering
Date: March 20, 2015
Re: Docket No. 15-BSTD-01 – Comments on Title 24

kW Engineering is a CALCTP-AT certified provider of lighting controls acceptance testing. We were one of the first firms to be certified in Northern California and have been conducting lighting controls acceptance testing since the code went into effect in July 2013. Our firm has provided commissioning services for three years, including lighting controls commissioning.

These comments reflect our experience with acceptance testing under Title 24-2013 and provide suggestions for improvements for Title 24-2016.

General

1. Section 130.4(a) requires that drawings be reviewed by the acceptance tester for compliance with Title-24-2013.

When acceptance testers are engaged on a project, we perform design review as required. If we are engaged before the project goes to permit review, there is little disruption to the project. However, we are frequently engaged near the end of the project. If the design does not meet code, requests for changes may cause a major disruption to the project – both in terms of delays and costs incurred as the design team modifies the design and the contractor changes the installation.

I recommend revising the requirement for code compliance review to be by the permitting department rather than by the acceptance tester.

NRCA-LTI-02-A – Timeclocks and occupancy sensors

2. Section B: The form indicates that sampling can be performed if the building has more than 7 occupancy sensors.
 - a. The statistical basis for a sample size of 7 is not apparent and conflicts with sample size requirements suggested by Performance Monitoring protocols. Small buildings are over sampled and large projects are under sampled. The sample

size should be based on IPMVP Appendix B methodology. This will allow for an even playing field for pricing acceptance testing, savings to owners with small projects, as well as ensure adequate sampling for large projects.

NRCA-LTI-03-A - Daylighting

3. General

- a. Testing of daylighting systems during partial daylight conditions is exceptionally difficult, especially if it is a cloudy day and the available light (from the sun) is not enough to be above 60% of the design lighting levels. On a sunny day, it is nearly impossible to have northern exposures achieve these levels. I recommend this section of the test either be deleted or modified to facilitate testing the lighting system in one visit (as well as maintaining the project schedule).

4. Section I: The form indicates that sampling can be performed if the building has more than 5 daylight control systems.

- a. The statistical basis for the sample size is unclear. Small buildings are over sampled and large projects are under sampled. I recommend that the sample size be based on IPMVP Appendix B methodology.

5. Section III

- a. Page 2 - The form requests whether the daylighting control system is open loop or closed loop. Lutron's daylight sensor is both open AND closed loop. This part of the form is also redundant – this question was answered on page 2 (part I, section 3). I request that the text of the form be revised to match the currently available technologies and remove the redundancy.

6. Section II

- a. Page 7, line k – the form requests the calculated ratio of the reference illuminance to the full output. The form refers to the reference illuminance as line i, but the reference illuminance is called out on line j.
- b. Step 3 also calls out line i.
- c. Page 9, standard dimming table. The chart only shows options for HID and fluorescent. I suggest adding a default power chart for LED.

Demand Response/NRCA-LTI-04-A

7. This form requires the testing of lighting control panels for projects over 10,000 square feet to assess whether they meet the requirements of 130.1(e) (demand response). This section of code only requires the system “be capable of” reducing power in response to a demand response signal; it does not require that the building owner sign up for this service with their utility.

If the building owner is not pursuing demand response, the sequences for enacting it are not described in the contract documents – lighting level reductions are not shown on the drawings or called out in the specifications. In order to satisfy the requirements of testing, the systems are set up with the best-guess of the lighting control system provider, putting the lighting control system supplier in a risky position. If the owner later

decides to implement demand response, the sequences will likely change – wasting time and money.

I recommend requiring this test if the Owner is actively pursuing demand response as part of the design (i.e. there is a sequence on the lighting control drawings); otherwise this test should be optional.

Lighting Certificates of Installation

8. The contractor completes the certificates of installation and checks off boxes to indicate the equipment has been set up and meets the requirements of Title 24 and Title 20. Title 24 section 10-103(a)4.a.iv requires that the acceptance tester review these forms. I, as the acceptance tester, also use these forms as an indicator that the system is ready for testing. Unfortunately, these forms are “happy hour forms” – the contractor can do what they think is setup/startup for the system, and then fill out the forms in the office (or at a bar during happy hour). These provide no assurance for the acceptance tester that the systems are ready to test.

Please revise the forms to require specific data that can’t be faked or copied throughout the forms (the acceptance test forms are a good example of this).

For example, page 2 of NRCI-LTI-02-E (EMCS or Lighting Control System), part 2.E.1, requires that a box be checked to indicate that the automatic time switch meets the requirements of Title 20. As is, this form provides no concrete evidence to the acceptance tester that the lighting control system has been set up or programmed. I recommend adding an additional field to require documentation of the schedule that was programmed in to the LCS.

Similarly, page 3, part 2.H.1 requires that the lighting control system be able to turn off the lights no more than 30 minutes after the area has been vacated. I recommend adding a field for the contractor to document the occupancy sensor time delay.