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## **NLCAA Response to Draft 2022 Energy Code Express Terms**

*Additional submitted attachment is included below.*



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California Energy Commission  
1516 9th Street, MS-4  
Sacramento, CA 95814

NLCAA comments on the Draft 2022 Energy Code Express Terms

Docket Number: 19-BSTD-03

NLCAA appreciates the opportunity to support the CEC in the effort to create a synergy between the energy codes and the compliance documents. Having worked with these documents since 2014 we have found that the ATTCPs, ATTs and ATEs can provide an invaluable look into how these documents are interpreted, misinterpreted, understood or even misused, by many different professionals using the energy codes.


The following are NLCAA's comments:

\*Ten days is too short amount of time to properly review and respond to all of the Express Terms.

1. **10-102: Definitions**
  - a. **NLCAA comments:** Add CCDR (Commission Compliance Data Repository)
  
2. **10-103.1(c)3Bi: Curricula.** *ATTCP training curricula for ATTs shall include, but not be limited to, the analysis, theory, and practical application of the following:*
  - a. *Lamp and ballast systems;*
  - b. *Line voltage switching controls;*
  - c. *Low voltage switching controls;*
  - a. **NLCAA comments:** A, b and c should be removed from the training curriculum. This is elementary knowledge for people who qualify to take the ATT certification course.
  
3. **100.1: Lighting definitions:**
  - a. **NLCAA comments:** Astronomical Time-Switch Control, Automatic Daylight Control, Automatic Scheduling Control, Automatic Time Switch Control, and Captive-Key Override were all added under lighting definitions. They should be removed from lighting definitions and added as new definitions since they are lighting controls.
  
4. **100.1: Dimmer, Continuous means a dimmer that varies the luminous flux of the electric lighting system over a continuous range from the device's maximum light output to the**



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5. *device's minimum light output without visually apparent abrupt changes in light level between the various steps.*
  - a. **NLCAA comments:** Adding "with more than 10 steps," would put it in line with the NA's.
  
6. **100.1:** *Dimmer, Stepped varies the luminous flux of the electric lighting system in one or more predetermined discrete steps between maximum light output and OFF with changes in light level between adjacent steps being visually apparent.*
  - a. **NLCAA comments:** Adding "with 10 steps or less," would align the code with the NA's.
  
7. **110.9(b)2:** *Daylighting Controls.*
  - a. **NLCAA comments:** There is currently no minimum time in the code that states how long the sensor has to wait before it starts reacting. Is it feasible to allow someone have the sensor dim the lights over two hours or should there be a time limitation? 
  
8. **110.9(b)3A:** *Be capable of reducing lighting power consumption by a minimum of 65% when at its lowest setting;*
  - a. **NLCAA comments:** Change 65% to 90% to match new daylighting requirements.
  
9. **110.12(a)1A:** *A certified OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification; or*
  - a. **NLCAA comments:**
    - i. This language is not clear on the intent and is misinterpreted by many people in varying fields. Adding layman language may help clarify these codes.
    - ii. Add "Note: A device used to directly receive a DR signal and listed on the Open ADR Alliance database. [https://products.openadr.org/? sf\\_ppp=10](https://products.openadr.org/? sf_ppp=10)"
  
10. **110.12(a)1B:** *Certified by the manufacturer as being capable of responding to a demand response signal from a certified OpenADR 2.0b Virtual End Node by automatically implementing the control functions requested by the Virtual End Node for the equipment it controls.*



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a. **NLCAA comments:**

- i. Change to "certified by the manufacturer to the Energy Commission." This is what is on NRCA form.
- ii. Add "Note: A device used to indirectly receive a DR signal (e.g., through a BMS) and listed on the CEC 2019 DR Lighting Controls Listing Database. <https://www.energy.ca.gov/media/3216>"

11. **110.12(c): Demand Responsive Lighting Controls.** *Nonresidential lighting systems subject to the requirements of Section 130.1(b) with a general lighting power of 4,000 watts or greater, shall have controls that are.....*

a. **NLCAA comments:**

- i. The method of using other codes as "triggers" has caused great confusion and misinterpretations. This was seen by NLCAA as it applied to Section 130.1(c)(5). NLCAA recommends removing the Section 130.1(b) language and modifying EXCEPTION 1 to 110.12(c)
- ii. Add new:
  1. The below spaces are not required to install demand responsive controls and do not count toward the 4,000-wattage threshold:
    - a. Spaces <100' and  $\leq 0.5$  w/ft<sup>2</sup>, AND
  2. Add from 130.1(b)
    - a. An area enclosed by ceiling height partitions that has only one luminaire with no more than two lamps.
    - b. Restrooms.

12. **110.12(c)1:** *For compliance testing, the lighting controls shall demonstrate a lighting power reduction in controlled spaces of a minimum of 15 percent below the total installed lighting power. The controls may provide additional demand responsive functions or abilities.*

- a. **NLCAA comments:** Add "no space may reduce below 50% of the design illuminance" which would align with the acceptance testing procedures.

13. **130.1(b): Multi-Level Controls**

a. **NLCAA comments:**

- i. Along with EXCEPTION 4 to Section 130.1(b) and EXCEPTION 5 to Section 130.1(b) relocated to 130.1(b), we recommend making the following changes to 130.1(b) which may create a clearer understanding:

"The general lighting of any enclosed area 100 square feet or larger, with a connected lighting load that exceeds 0.5 watts per square foot, shall provide multilevel lighting controls that allow the level of lighting to be adjusted up and down.



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The multilevel controls shall:

1. Provide the number of control steps specified in TABLE 130.1-A. and;

EXCEPTION 1 to Section 130.1(b)1: Classrooms with a connected general lighting load of 0.7 watts per square feet or less shall have a minimum of one control step between 30-70 percent of full rated power, regardless of luminaire type.

EXCEPTION 2 to Section 130.1(b)1: Library stack aisles, aisle ways and open areas in warehouses, parking garages, parking areas, loading and unloading areas, stairwells, and corridors shall have a minimum of one control step between 20-60 percent of full rated power, regardless of luminaire type.

2. Meet the uniformity requirements specified in TABLE 130.1-A.

EXCEPTION 1 to Section 130.1(b): An area enclosed by ceiling height partitions that has only one luminaire with no more than two lamps.

EXCEPTION 2 to Section 130.1(b): Restrooms.

EXCEPTION 3 to Section 130.1(b): Healthcare facilities.”

14. **EXCEPTION 1 to Section 130.1(b):** *An area enclosed by ceiling height partitions that has only one luminaire with no more than two lamps.*

a. **NLCAA comments:** Add “Note: LED have zero lamps.”

15. **130.1(c)5:** *Areas where Occupant Sensing Controls are required to shut OFF All Lighting for specified offices, multipurpose rooms, classrooms, conference rooms and restrooms. In offices 250 square feet or smaller, multipurpose rooms of less than 1,000 square feet, classrooms of any size, conference rooms of any size, and restrooms of any size, lighting shall be controlled with occupant sensing controls to automatically shut OFF all of the lighting when the room is unoccupied.*

~~*In areas required by Section 130.1(b) to have multilevel lighting controls, the occupant sensing controls shall function either as a:*~~

~~*A. Partial ON Occupant Sensing Controls capable of automatically activating between 50-70 percent of controlled lighting power, or*~~

~~*B. Vacancy Sensing Controls, where all lighting responds to a manual ON input only.*~~

~~*In areas not required by Section 130.1(b) to have multilevel lighting controls, the occupant sensing controls shall function either as a:*~~



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- A. *Occupant Sensing Controls; or*
- B. *Partial-ON Occupant Sensing Controls, or*
- C. *Vacancy Sensing Controls, where all lighting responds to a manual ON input only.*

a. **NLCAA comments:**

- i. The first part of this section can be removed by adding an exception. Add "Exception to 130.1(c)5" In areas required by 130.1(b) to have multi-level lighting controls the occupant sensing device cannot function as Occupant sensing control.  
OR
- ii. "Exception to 130.1(c)5" In areas required by 130.1(b) to have multi-level lighting controls, the occupant sensing device shall function as a partial –ON occupant sensing control or vacancy sensing control.  
OR
- iii. The method of using other codes as "triggers" has caused great confusion and misinterpretations. This was seen by NLCAA as it applied to Section 130.1(c)(5). NLCAA recommends removing the Section 130.1(b) language and modify EXCEPTION 1 to 130.1(b).
- iv. The within 20 minutes time out should be included with this code. Also, should be included in 130.1(c)6 & 7

16. **EXCEPTION 2 to Section 130.1(c)6A:** *When metal halide lighting or high pressure sodium lighting is installed in warehouses, occupant sensing controls shall reduce lighting power by at least 40 percent.*

- a. **NLCAA comments:** Not sure if this exception is still needed. The current LPDs energy code does not support the use of these lighting sources.

17. **130.1(c)6D:** *In office spaces greater than 250 square feet, **general lighting** shall be controlled with occupant sensing controls that meet all of the following:*

- a. **NLCAA comments:** This is the only part of 130.1(c) that says general lighting. Should it be all lighting?

18. **130.1(c)6Dii:** *Within 20 minutes of the control zone being unoccupied, the occupant sensing controls shall uniformly reduce lighting power in the control zone to **no more than 20 percent** of full power; and*

- a. **NLCAA comments:** Change to "By at least 80%." This language will align with other energy code language.



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19. **130.1(c)6Div:** *In each control zone, lighting shall be allowed to automatically turn on to full power upon occupancy within the control zone. When occupancy is detected in any control zone in the space, the lighting in other control zones that are unoccupied shall operate at **no more than 20 percent of full power.***
- a. **NLCAA comments:** Change to "be reduced to at least 80%." This would help with interpretation if it's used the same percentage as (ii) and aligning with other code language.
20. **130.1(d)2:** *General lighting in overlapping primary and secondary sidelit daylight zones shall be controlled as part of the primary sidelit daylight zone. LED and other solid state lighting (SSL) light sources **may** be treated as linear lamps in increments of 4 feet segments or smaller, and each segment is separately controlled based on the type of the daylight zone the segment is primarily located.*
- a. **NLCAA comments:** Revise to "may or shall." May is not enforceable as code.
21. **130.1(d)3B:** *For each space, ensure the combined illuminance from the controlled lighting and daylight is not less than the illuminance from controlled lighting when no daylight is available;*
- a. **NLCAA comments:**
- Add "and not greater than 150% than the illuminance from controlled lighting when no daylight is available"; This is a requirement on the Acceptance test.
  - Unless the NRCA and NAs are going to be revised, if the 150% is removed, it would allow a greater cushion during the testing procedures without limiting the amount of daylight incoming to the space being tested.
22. **130.1(d)3(D):** *For parking garages, ensure that when daylight illuminance levels measured at the farthest edge of the secondary sidelit zone away from the glazing or opening are greater than 150 percent of the illuminance provided by the controlled lighting when no daylight is available, the controlled lighting power **in the combined daylight zones** shall be reduced by 100 percent.*
- a. **NLCAA comments:**
- Change "the combined daylight zones" to, "the combined Primary and Secondary zones. This will make it easier to understand on the first read.  
OR
  - Maybe create a new zone. "Parking Daylight Zone: the area in plain view directly adjacent to each vertical glazing, two window head heights deep into the area, and window width plus 0.5 times window head height wide on each side of the rough opening of the window, minus any area on a plan beyond a permanent





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obstruction that is 6 feet or taller as measured from the floor." which might make it less confusing for some people.

OR

- iii. "In the Primary and the Secondary Daylit Zones totaled together shall be reduced by 100 percent."

23. **130.1(d)4:** *When photosensors are located within the daylit zone, at least one photosensor shall be located so that they are not readily accessible to unauthorized personnel.*

a. **NLCAA comments:**

- i. This should be removed or changed to all photosensors not "at least one." Technology does not support more than one daylight sensor to control a zone.

24. **EXCEPTION 3 to Section 130.1(d):** *Rooms in which the combined total installed general lighting power in the Skylit Daylit Zone and Primary Sidelit Daylit Zone is less than 120 Watts,, or in which the combined total installed general lighting power in Secondary Sidelit Daylit Zone is less than 120 watts, or in which the combined total installed general lighting power in primary and secondary sidelit daylit zone is less than 240 Watts, or in parking garage areas where the total combined general lighting power in the sidelit daylight daylit zones is less than 60 watts.*

a. **NLCAA comments:**

- i. The word "combined" is still overlooked or misinterpreted by many users of the code. This results in the lack of required controls installed and testing being performed. NLCAA recommends separating the exceptions so they are easier to understand:

1.Rooms in which the total wattage in the Primary and Skylit Daylit Zone is less than 120 watts do not require control for the Daylit Zones.

2.Rooms in which the total wattage is less than 120 watts in the Secondary Daylit Zone do not require control in the Secondary Daylit Zone.

3. Rooms in which the total installed wattage is less than 240 watts in the Primary and Secondary Daylit Zone do not require daylit control in the Secondary Daylit Zone.

4. Parking garage areas where the installed wattage of the Primary and the Secondary Daylit Zones totaled together is less than 60 watts will not require control in the daylit zones.



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25. **130.1(f)4:** *The multilevel lighting control shall permit the demand responsive control to adjust the lighting during a demand response event and to return it to the level set by the multilevel control after the event.*
- a. **NLCAA comments:** This can be added to the NRCA-LTI-04-A as an added test.
26. **130.1(f)7:** *For lighting controlled by multilevel lighting controls and by occupant sensing controls that provide an automatic-on function, the controls shall provide a partial-on function that is capable of automatically activating between 50-70 percent of controlled lighting power*
- a. **NLCAA comments:** We would like to review the ISOR for this. Not sure what the point of this code is or should it reside in 110.9 or 130.1(c).
27. **130.1(f)8:** *For lighting controlled by automatic daylighting controls and by occupant sensing controls, the controls shall be configured so that power does not exceed the lesser of the allowed power by either control.*
- a. **NLCAA comments:** This language is unclear on the intent or the purpose. Please clarify in different language.
28. **130.2(c)2A:** *Automatic scheduling controls shall be installed for all outdoor lighting. ~~Automatic Scheduling Controls may be installed in combination with motion sensing controls or other outdoor lighting controls.~~*
- a. **NLCAA comments:** Unless there was confusion at some point on when Automatic Scheduling controls can be used with other controls; this language can be removed.
29. **130.2(c)2B:** *Automatic scheduling controls shall be capable of reducing the outdoor lighting power by at least 50 percent and no more than 90 percent, and ~~separately~~ capable of turning the lighting OFF, during scheduled unoccupied periods.*
- a. **NLCAA Comments:** Removing “separately” will not change the meaning.
30. **130.2(c)2C:** *Automatic scheduling controls shall allow scheduling of a minimum of two ~~nighttime~~ periods with independent lighting levels, and may include an override function that turns lighting ON during its scheduled dim or OFF state for no more than two hours when an override is initiated.*



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- a. **NLCAA comments:** If a control can create multi schedules, it's probably true that it can create them at any time of the day. Remove "Nighttime."
31. **130.2(c)2D:** *Acceptance tests of outdoor lighting controls shall verify the scheduled occupied and unoccupied periods, as specified in Section 130.4(a)6.*
- a. **NLCAA comments:** This should be removed, or a similar line should exist in all codes stating where acceptance testing is required for consistency.
32. **130.2(c)3A:** *Motion sensing controls shall be installed for the following luminaires. ~~Motion sensing controls may be installed for other outdoor lighting and in combination with other outdoor lighting controls.~~*
- a. **NLCAA comments:** Unless there was confusion at some point on when Motion sensors can be used, this language can be removed.
33. **130.2(c)3Aii:** *Outdoor wall mounted luminaires installed for Building Façade, Ornamental Hardscape or Outdoor Dining lighting that have a bilaterally symmetric distribution as described in the IES Lighting Library™ and mounted 24 feet above grade or lower.*
- a. **NLCAA comments:**
- i. There are five books in the IES lighting library, which book is needed? The entire library is \$800, this is more expensive than the IES Lighting Handbook at \$600 called out for in the 2019 BEES.
  - ii. Could a definition be added to section 100.1 for the word "bilaterally symmetric distribution"? These codes are reviewed by various trade professionals, not all of them are designers. It would be like asking the architect to use the NEC, no offence meant.
34. **130.2(c)3B:** *Motion sensing controls shall be capable of reducing the outdoor lighting power of each controlled luminaire by at least 50 percent and no more than 90 percent, and ~~separately~~ capable of turning the luminaire OFF, during unoccupied periods.*
- a. **NLCAA comments:** Removing "separately" will not change the meaning.
35. **130.4(a): Lighting and Receptacle Control Acceptance Requirements.** *Before an occupancy permit is granted, indoor and outdoor lighting and receptacle controls serving the building, area, or site and installed to comply with Sections 110.12, 130.1, 130.2, 130.5 or 140.6 shall be certified as meeting the Acceptance Requirements for Code Compliance, in accordance with*



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Section 130.4(a) as specified by the Reference Nonresidential Appendix **NA7.6 and NA7.8**. A Certificate of Acceptance shall be submitted to the enforcement agency under Section 10-103(a) of Part 1, that the equipment and systems meet the acceptance requirements:

a. **NLCAA comments:**

- i. NA7.6 and 7.8 don't align with the testing procedures in the NRCAs, the NAs stated here should be replaced with the applicable NRCA forms.
- ii. Section 141.0 is not listed as a code section to comply with.

36. **140.6(a)2H**: To qualify for the PAF for daylight continuous dimming plus OFF control, the daylight control and controlled luminaires shall comply with Section 130.1(d), 130.4(a)3 and **130.4(a)7**, and the daylight control shall be continuous dimming and shall additionally turn lights completely OFF when the daylight available in the daylit zone is greater than 150 percent of the illuminance received from the general lighting system at full power. The PAF shall apply only to the luminaires in the primary sidelit daylit zone, secondary sidelit daylit zone and the skylit daylit zone.

a. **NLCAA comments:** Why is Institutional tuning a requirement here?

37. **EXCEPTION 4 to Section 141.0(b)2I**. Acceptance testing requirements of Section 130.4 are not required for alterations where lighting controls are added to control 20 or fewer luminaires.

a. **NLCAA comments:**

- i. This exception should be moved to or added to section 130.4(a).  
OR
- ii. This exception should be stated as a "Note:" and added to 130.4(a)

38. **EXCEPTION 5 to Section 141.0(b)2I**. Any alteration limited to adding lighting controls or replacing lamps, ballasts, or drivers.

a. **NLCAA comments:** Change to "replacing only one of the following: lamps, ballasts or drivers."

39. **Exception to Section 141.0(b)L**. Acceptance testing requirements of Section 130.4 are not required for alterations where controls are added to 20 or fewer luminaires.

a. **NLCAA comments:**

- i. This exception should be moved to or added to section 130.4(a).  
OR
- ii. This exception should be stated as a "Note:" and added to 130.4(a)