



KYLE PITSOR
Vice President, Government Relations

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Submitted via email: docket@energy.ca.gov

Mr. Andrew McAllister
Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Notice of Staff Workshop on Draft Language for the Residential and Nonresidential Building Energy Efficiency Standards and Associated Documents

Dear Commissioner McAllister,

The National Electrical Manufacturers Association (NEMA) appreciates the opportunity to provide the attached comments on the California Energy Commission's Staff Workshop Draft Language for the Residential and Nonresidential Building Energy Efficiency Standards. These comments are submitted on behalf of NEMA Lighting Systems Division companies.

As you may know, NEMA is the association of electrical equipment and medical imaging manufacturers, founded in 1926 and headquartered in Arlington, Virginia. Its nearly 400 member companies manufacture a diverse set of products including power transmission and distribution equipment, lighting systems, factory automation and control systems, and medical diagnostic imaging systems. The U.S. electroindustry accounts for more than 7,000 manufacturing facilities, nearly 400,000 workers, and over \$100 billion in total U.S. shipments.

Please find our detailed comments below. We look forward to working with you further on this important project. If you have any questions on these comments, please contact Alex Boesenberg of NEMA at 703-841-3268 or alex.boesenberg@nema.org.

Kyle Pitsor

Vice President
NEMA Government Relations

NEMA Comments on Draft Language for the Residential and Nonresidential Building Energy Efficiency Standards and Associated Documents

General Comments:

NEMA has been collaboratively working with staff and contractors since June on the CASE proposals. We are encouraged by CEC's interest to promote lighting efficiency and lighting quality with new technologies. NEMA members proactively promote lighting efficiency and quality in our products and design solutions.

We were very disappointed that there was no attempt to resolve a major scheduling conflict for the November 3 workshop for industry members. As previously explained in our correspondence of November 24, the workshop conflicted with the Illuminating Engineering Society (IES) annual conference, which severely limited our members' ability to be engaged in the workshop. We are submitting preliminary comments at this time, but in order to provide more specific comments, our members need to review the presentations and transcripts. The transcripts are still not available; therefore we will reserve the right to provide additional or modified comments once the transcripts can be reviewed.

Title 24 is an excellent standard to promote energy efficient buildings by setting performance standards. However, with every cycle of regulatory updates, the requirements are becoming more prescriptive. The proposals for residential lighting to be included the 2016 code are entirely prescriptive. This approach limits consumers, designers and builders to a set of product and design solutions that may not be aligned with the end user's priorities. The prescriptive approach also limits technology development by forcing manufacturers to design components that may not maximize the overall efficiency or other consumer features.

NEMA members expressed technical, testing and market concerns for several proposals at the staff workshop in June. It appeared at that time that there was agreement for modifications in a number of areas, but the materials presented at the November 3 workshop do not seem to incorporate or address these concerns. Our concern with respect to industry's inability to participate fully in the recent workshop is magnified.

The residential lighting proposals assume that superior performance in each attribute is required for every application in a residence. The proposals have not provided the substantiation with regard to consumer preference for specific threshold levels of performance and some are not technically justified. There is no consideration in the proposals to account for different needs with respect to the application, such as kitchens, bathrooms, garages, and outdoor lighting. Furthermore, no economic justification has been provided for the cost analysis of systems that require the combination of all of the performance attributes.

We look forward to reviewing the materials from the November 3 workshop and may provide more specific comments once we have reviewed the transcripts. We are anxious to continue a collaborative and open process to help California promote a flexible approach to high efficiency buildings.

Title 24 Part 01, Chapter 10

1. Changes to several definitions

Since the CEC has opened a discussion of definitions as a result of some of their recommended changes to this Part, we have taken this opportunity to examine existing definitions in other

references and offer up proposals for harmonized definitions and terms. The revisions to the definitions are attached as an appendix to our comments. We hope the CEC will consider the comments and incorporate them into the 45-day language for public comment.

Specifically, we wish to raise concerns with the proposed definition of “Recessed Luminaire” and how the proposal as written interacts with other proposed changes in Title 24, and could cause unintended conflicts in application of the Standard. The draft standard defines a recessed luminaire as *“a luminaire that is mounted above the ceiling or behind a wall or other surface with the opening of the luminaire level with the interior surface.”* In the context of the requirements of the standard, this definition imposes requirements on troffers, step lights or other recessed luminaires that were not subject to requirements in the past. Previous versions of Title 24 included thermal and IC ratings with the intent to be applied only to downlights. We indicated during the June workshop that this was an issue, and we expected the definition of a recessed luminaire to include only recessed downlights in the next draft of the Standard. We refer the CEC to item 4 of our responses to Section 150 proposals for more.

Title 24 Part 06

1. Section 130.0 - Changes to Luminaire conversion practices

We applaud the intention of the CEC staff to simplify the code and align with other standards such as ASHRAE 90.1. Removing items like: “Luminaire modification in place” is the right step.

We further urge the CEC to remove all declarations such as in 130.0(c)5: “...Field modifications, including hard wiring of an LED module, shall not be recognized as converting an incandescent luminaire or luminaire housing to a non-incandescent technology”. We believe it is potentially very confusing to consumers and inspectors to convert a luminaire from one technology to another and yet continue to treat it as if it were something else.

2. Section 130.1(b) - Change title “Multi-Level Lighting Controls” to “Multi-Level Lighting Control”. To be consistent with new wording in paragraph.

3. Section 130.1(b)3 - The current proposed language may be misinterpreted to require a manual dimmer for each individual fixture. Also “A” is not needed. We suggest the following change:

Dimmable luminaires shall also be controlled by ~~a manual dimmer according to Section 130.1(a)2C.~~ A manual dimming meeting the applicable requirements of Section 130.1(a).

4. Section 130.1(c) Shut-OFF Controls - Change 10 minute timeout values to 20 minutes to align with Section 110.9(b)4F. If an occupancy sensor with a 20 minute timeout can be used in these spaces then a countdown timer with 20 minute setting should be allowed. Ten minutes is too short of a period, and it may cause false offs. We suggest the following change:

EXCEPTION 1 to Section 130.1(c)2: Single-stall bathrooms less than 70 square feet, and closets less than 70 square feet may use countdown timer switches with a maximum setting capability of ~~ten~~ 20 minutes to comply with the automatic shut-Off requirements.

5. Section 130.1(d) - Strikeout “not” and “un” in this section to align with proposed language in the CASE report. *Example:*
 - i. *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 ~~un~~authorized personnel but may be inside a locked case or under a cover which requires a tool for access.*
6. Section 130.2(c)3.B. - We support the requirement for control responsive lighting, however we have questioned in the past why there is a limit to the dimming range. Since Title 24 is an application standard, the lighting design must ensure that it meets IES illuminance levels as well as safety and security concerns. There are some areas of an outdoor application where it may be more efficient and more cost effective to reduce the lighting power to zero. This does not imply that all the lights in an area would be off, but selected equipment could be turned off during times when the space is unoccupied and save additional energy. We ask that the Commission explain the justification for the dimming range of 40-90% and consider a dimming range of 40-100%.
7. Proposed changes to Section 130.2(c)4. NEMA believes that outdoor sales lots and outdoor sales canopies are designed with similar considerations to hardscape areas. We support the removal of these application types from the exceptions to outdoor controls.
8. Table 140.7-A Changes to Hardscape Lighting Power Allowances NEMA supports updates to the models to use LED technology as the baseline for lighting power allowances in tables 140.7.A and 140.7B.

We direct the CEC’s attention to remarks at the June 23, 2014 workshop, where it was stated that the models were based on projections regarding how products would perform by January 2017. This raises serious concerns regarding the standard’s compliance the Warren-Alquist Act, which mandates that the standards shall be “technologically feasible and cost-effective.” The term “feasible” has been interpreted in California statutes as “practicable – i.e., capable of being done or carried out. It does not mean possible or probable.” It is not appropriate to base the power models for outdoor lighting on probably projections about future performance. We recommend that the models be reevaluated using technology that is currently feasible to meet the statutory requirement.

At the June 23, 2014 workshop NEMA and lighting manufacturers indicated a concern with the significant reductions in lighting power density in lighting zones 3 and 4. The November 3 presentation for this section indicated that the power allowances were reduced about 35-40%, however that range is not consistent with the proposed standards language. The reductions in the general hardscape area wattage allowance are as follows: LZ1: 43%, LZ2: 33%, LZ3: 56%; LZ4: 57%. It was explained that the 2005 models used 250w MH technology, which is not as efficient as other MH wattages. However, the 250w products are not generally used in lighting zones 3 and 4 to achieve the higher illuminance requirements. These variations seem to be more aggressive for zones that impact the majority of installations. Consistent with the previous comment, we would like for the models to be reevaluated to ensure that the assumptions are correct and applied consistently to all lighting zones.

In addition, the IES has recently issued an update to RP-20 for parking facilities. The updates to the recommended maintained illuminance levels do not impact the power

allowances for areas with asphalt surfaces. However they have added new illuminance requirements for concrete surfaces and transactional areas. We recommend that exceptions be added to Tables 140.7-A and 140.7-B to provide a multiplier of 2.0 to accommodate concrete surfaces and transactional areas to be consistent with IES illuminance recommendations.

9. Table 140.7-B Changes to Additional LPAs for Additional Applications NEMA echoes our proceeding comments to Table 140.7A which also apply to Table 140.7B

Section 150 Residential Lighting Requirements

1. General comment to Section 150.0(k)
While we appreciate the goal of increasing the energy efficiency of residential lighting, Title 24 is not an equipment standard. This section has become overly prescriptive, which restricts equipment choices and design flexibility. It seems that the prescriptive approach has been favored by the Commission to assist in the inspection process, but the proposals have not presented information to verify that they are technologically feasible and cost effective as mandated by the Warren-Alquist Act.
2. 150.0(k)1.A. – The requirement for all installed luminaires to be high-efficacy does not consider the needs for various applications in a home. In addition, the “quality” attributes defined in Joint Appendix JA8 establishes non-energy requirements that will increase the cost of the equipment. We support lighting quality, but the arbitrary thresholds that are defined for some attributes may not be required, or desired, in certain areas of a home or multi-family facility. The Commission is encouraged to reevaluate Joint Appendix 8 requirements not related to efficacy in the context of application, intended use, technological feasibility and cost effectiveness and remove those requirements which do not measure up to these considerations. We provide additional details below in our comments to JA8.
3. 150.1(k)1.B. Blank Electrical Boxes - The total number of boxes should not be limited to number of bedrooms but rather the number of total rooms so that homeowners can install a ceiling fan or luminaire in these boxes for each room if desired. We suggest the following change:
150.0(k)1B Blank Electrical Boxes. The number of electrical boxes that are more than 5 feet above the finish floor and do not contain a luminaire or other device shall be no greater than the number of bedrooms. These electrical boxes must be served by a dimmer, ~~or~~ vacancy sensor, or fan speed control
4. 150(k)1.C. – Section 100.1 has added a new definition for a “recessed luminaire”. Under this definition, a recessed luminaire is *“a luminaire that is mounted above the ceiling or behind a wall or other surface with the opening of the luminaire level with the interior surface.”* This means that a recessed luminaire includes troffers as well as recessed sconces or hallway lights, as well as downlights. The requirements in this section include various thermal and insulation contact requirements that have never applied to this broader definition of recessed lighting. It also applies to spaces where there may not be any insulation, such as a wall. We do not understand why recessed lighting is subject to additional thermal requirements and must comply with JA8, regardless of light source type. As currently proposed, this section will essentially obsolete all fluorescent troffers and steplights. We acknowledge that the insulation contact is appropriate for downlights

installed in a space with insulation; however the test methods have not been applied to other types of recessed luminaires. There is no technical justification for a recessed luminaire to comply with Joint Appendix JA8. There are also various inconsistencies in the references to JA8 because the requirements appear to focus on solid state lighting, but many of the tests do not apply to non-SSL technologies. Furthermore, the thresholds established would obsolete many energy-efficient and cost-effective recessed lighting solutions.

5. 150.1(k)2.A. Interior Lighting Switching Devices and Controls – The CEC needs to add “leading-edge” to this because SSL 7A only cover leading-edge phase cut dimmers. We suggest the following change:
150.0(k)2.A. All leading-edge phase cut dimmers shall comply with NEMA SSL 7A.

Title 24 Joint Appendices

1. Joint Appendix 8, JA8
 - a) Since JA8 has now been modified to cover all high efficacy lighting and Section 150 requires all lighting to be high efficacy, there are a variety of test methods and/or reporting requirements applicable to these products that are technically flawed. Many of the requirements appear to relate to LED test methods for light sources or lamps, but the draft text would cover all high efficacy lighting including luminaires. The joint appendix needs substantial work to clarify whether requirements apply to a lamp, LED board or luminaire.
 - b) We recognize and appreciate the Commission’s interest in promoting the market adoption of LED technology while ensuring a certain level of consumer satisfaction. However, the proposed revisions to JA8 include an extensive list of quality attributes that may be subjective to consumers or are not required for certain installations. In general, NEMA members believe that the list of attributes are quality attributes that vary based on the application and cannot be regulated based on one size fits all approach for the product performance. These additional requirements will drive cost up unnecessarily, which in turn could prohibit or discourage the adoption of LED technology. An unintended consequence of this requirement for LED products could be a retrograde to CFL fixtures.
 - c) In most cases, the Commission has not provided the technical justification for the quality metrics or thresholds. Some thresholds reference levels that are inconsistent with industry standards or relate to areas where ongoing research is being conducted to establish industry standards.
 - d) The scope of JA8 covers all LED sources well as any sources not included in Table 150.0-A. This approach raises concerns because any new lighting technology is subject to JA8, even if the criteria do not apply to the new technology. For instance, organic LED lighting would be subject to the requirements of JA8. Many OLED products are very low wattage any may not meet JA8 efficacy, color or electrical requirements. Therefore, the Commission is restricting the introduction of new and promising energy efficient technologies through the misapplication of JA8. There may be other lighting technologies introduced in the future that would be restricted for use in California due to the requirements of JA8. We recommend that any luminaires that are 5 watts or less be exempt from the requirements of JA8. Furthermore, because CEC is extending this appendix to lamps through reference to the T24 Joint Appendices in lamp requirements¹

¹ See Title 20 Section 150k(1)(g)

we also propose that lamps 5 watts or less also be excluded from these requirements in the Appendix. This 5w level for lamps is consistent with programs such as ENERGY STAR Lamps which uses 5w as a threshold for changes to requirements such as power factor.

- e) Many luminaires are now being designed to provide color changing or color tunable lighting, and this feature will be negatively impacted by the CRI and CCT requirements of JA8. Light sources or luminaires that provide color changing or color tunable lighting should be excluded from the color requirements of JA8.
- f) As was indicated by the lighting industry at the June workshop, color temperature is a consumer preference and may be warm or cool depending on the furnishings in the space. In addition, color rendering may need to be high in some applications, but not so high in others. Mandating a 3000K or less within 0.0033 Duv may not represent customer preference for a color above or below the BB curve². The current color proposals mandate a superior color performance that may not be cost-effective for certain areas of the home or multi-family facility. We recommend that the regulations be written to allow the consumer to evaluate the performance and cost tradeoffs, since this information is widely available on the Lighting Facts label, and make the decision about what product meets their needs. We recommended at the June workshop that the builder or designer be required to advise the owner regarding the selection of light sources / luminaires and their color characteristics. A process could easily be put in place to have an owner sign off, validating that the owner is aware of the color performance that will be installed. This allows the end user to select based on their preference and evaluate the cost tradeoffs. A minimum CRI may be warranted to ensure that poor performing products are not installed. A 90 CRI may be desirable for some consumers in certain areas such as a kitchen or bathroom, while an 80 CRI may be sufficient in a garage. The 2013 Standard allowed flexibility since low-efficacy lighting was allowed to a certain extent in a home. The 2016 proposals establish a minimum 90 CRI for all LED lighting in all areas of a home, but this position has never been technically validated to reflect consumer preference nor has it been illustrated to be cost-effective. See our comment (k) below.
- g) As indicated at the June workshop, the requirements of JA8 now apply to all luminaires including outdoor lighting. Many of the requirements, such as CRI and CCT, are not appropriate for outdoor lighting. The Commission should reevaluate the requirements relative to outdoor lighting and provide the technical justification for any quality requirements for outdoor lighting beyond efficacy.
- h) The marking requirements under JA8.5 are not reasonable and in many cases are not feasible. The performance levels are already listed on the packaging in the Lighting Facts label. It is unclear why the manufacturing date is needed since Title 24 is based on the building installation, not when the product was manufactured. However the manufacturing date is listed on the UL label. These markings seem to be included to help facilitate the inspection; however, we encourage the Commission to consider inspector training and builder/designer documentation rather than attempting to put information on a small product where the performance and/or aesthetics may be compromised.
- i) Regarding CRI markings, we note to the CEC that there is an acceptable IEC marking system which simplifies the process. If the CEC moves to require CRI/CCT markings on

² See these papers on consumer color preference by ASSIST <http://www.lrc.rpi.edu/programs/solidstate/colorResearch.asp> and by Dr. Yoshi Ohno http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ohno_color-quality_tampa2014.pdf

lamps, this system should be used and could be included by adding text such as “The IEC62732 system may be used to identify the CRI and CCT of the light source.”

- j) We refer the CEC to item #2 above in our comments to Section 150 regarding non- efficacy requirements and Joint Appendix 8.
- k) The desire by California to require higher CRI as shown in the JA8 Appendix is not consistent with a growing number of global technical experts demonstrating mounting evidence that a color rendering index above 80 is not justified. This is shown in the following documents:

<http://www.ies.org/PDF/PositionStatements/PS-8-14.pdf> from the Illuminating Engineering Society

http://www.lightingeurope.org/uploads/files/LightingEurope_position_paper_on_color_quality_06102014.pdf from LightingEurope

http://www.edisonfoundation.net/iei/Documents/IEE_Evaluation%20of%20Best-in-Class%20LED_Final.pdf from Edison Foundation IEE

<http://www.nema.org/Policy/Documents/NEMA%20Lighting%20Division%20Position%20Paper%20on%20Color%20Rendering%20Index%2021Nov14.pdf> from NEMA

<http://www.regulations.gov/contentStreamer?objectId=09000064817aed61&disposition=attachment&contentType=pdf> from Dr. Kevin Houser of Penn State

<http://www.lrc.rpi.edu/programs/solidstate/pdf/Freyssinier-ColorMetrics-SPIE2010.pdf> from The Lighting Research Center at Rensselaer Polytechnic Institute

2. Joint Appendix 10, JA10

The flicker thresholds proposed have not been technically justified and do not accurately represent the flicker potential of the light source, luminaire and dimmer operating as a system. The proposed standard focuses on flicker percent rather than flicker index, which is the most common approach to quantifying flicker. The proposed restriction on flicker percent will eliminate some energy efficient and cost effective step drivers for residential applications. There is a series of ongoing research in the area of flicker. It is premature, and potentially harmful, for the Commission to establish arbitrary levels at this time. We refer the Commission to our recent comments to Title 20’s rulemaking regarding Flicker³.

While NEMA agrees that flicker test procedures are needed, and our members are actively participating in these efforts internally and externally to the association, we disagree with CEC’s attempts to be the source of these test procedures. There are several efforts underway in groups such as IEEE 1789 (document in ballot), IEC, NEMA (SSL-7B) and at research facilities such as LRC (ASSIST program) and others. CEC should defer to the scientific lighting community on this subject and not undermine their efforts with a one-off State-specific requirement which has not been adequately tested. We again refer to our comments to CEC Title 20 on the issues regarding the inadequacy of the Flicker Test proposal development process.

³ CEC September 29, 2014 staff workshop, NEMA comments: http://www.energy.ca.gov/appliances/2014-AAER-01/prerulemaking/documents/2014-09-29_workshop/comments/NEMA_Comments_on_Staff_Analysis_of_Small_Diameter_Directional_Lamp_and_Light_Emitting_Diode_Lamp_Efficiency_Opportunities_2014-11-14_TN-740012.pdf

The draft language in Section JA10.2 is confusing and should be withdrawn. For example, it is unclear which dimmer(s) are to be used. As written the test arguably must be repeated for *every dimmer/lamp combination*, and every number of lamps that can be used, and the test results reported and enforced by CEC. The uncertainty and administrative burden should not be overlooked. Our point is that there is a huge amount of testing required to confirm compatibility using the proposed California-specific approach. This testing will rapidly become burdensome, and will never ensure 100% compatibility. The CEC should remain compliant with existing processes, which require manufacturers to maintain compatibility lists for dimmer/lamp combinations in writing or on their websites (such as is now done in ENERGY STAR).

In the November 3rd public workshop, it was stated that the proposed test is needed to enable compliance with existing Title 20 requirements. We understand this sentiment. It was further stated that while this test is not harmonized with existing requirements, “something is better than nothing”. We disagree. By establishing a test procedure, the CEC is implying that it will effectively address the issue of flicker. It will not. Nor is it based on a statistically significant study and data set. The proposed test will become an added burden on manufacturers for testing and reporting and those costs will be passed on to the consumer, without proof that the flicker issue will be effectively addressed and resolved.

Additionally, the approach used by CEC in establishing the proposed flicker requirements at the component level ignores the reality that flicker is caused by interaction of two or more discrete components. The approach in JA10 with respect to how it is intended to apply to flicker and solve the perceived problem is flawed. This inaccuracy means that individual components cannot be tested and reported as compliant, due to the infinite numbers of light source to dimmer combinations. This raises possible enforcement and legal complications. For all these reasons, the CEC should wait for current flicker specifications development activities to conclude. Following their publication, NEMA is happy to work with CEC staff and stakeholders to collaborate in the incorporation of these standards into Title 20 and Title 24.

Conclusion: NEMA encourages the CEC to delete JA10

Appendix of Changes to Definitions

Title 24	IES	Comment
Compact Fluorescent Lamp is a fluorescent lamp less than 9 inches maximum overall length (M.O.L.) with a T5 or smaller diameter glass tube that is folded, bent, or bridged.	Compact fluorescent lamp is a fluorescent lamp with a small diameter glass tube (T5 or less) that is folded, bent or bridged to create a long discharge path in a small volume. The lamp designs generally include an amalgam and a cold chamber, or a cold spot, to control the mercury vapor pressure and light output.	Use IES
Illuminance is the incident luminous flux density on a differential element of surface located at a point and oriented in a particular direction, expressed in lumens per unit area.	Illuminance is the area density of the luminous flux incident at a point on a surface	Use IES
Light Emitting Diode (LED) definitions used in Part 6 are in Section 6.8 of ANSI/IES RP-16-10.	Light emitting diode is a p-n junction solid state diode whose radiated output is a function of its physical construction, material used and exciting current. The output may be in the near ultraviolet, the visible or in the infrared regions of the spectrum.	Use IES
Lumen Maintenance is a strategy used to provide a precise, constant level of lighting from a lighting system regardless of the age of the lamps or the maintenance of the luminaires.	Lumen flux maintenance is the remaining luminous flux output (typically expressed as a percentage of the initial luminous flux output) at any selected elapsed time. Luminous flux maintenance is the converse of luminous flux depreciation.	Proposed change: A lighting control strategy that provides at least three light levels—one at full-ON or at a high light level and two or more at lower levels. This may include turning off some portion of the lighting so that uniform light level and distribution is maintained. In addition to the three ON settings, multi-level control may provide for full-OFF. Continuous dimming systems meet this requirement. Also known as multi-level switching or stepped switching.
Luminaire is a complete lighting unit consisting of lamp(s) and a light source such as a lamp or lamps, together with the parts that distribute the light, position and protect the lamp(s), and connect the lamp(s) light source and connect it to the power supply.	Luminaire (light fixture) - A complete lighting unit consisting of a lamp(s) and ballast(s) (when applicable) together with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply	Use IES
Pendant is a mounting method in which the luminaire is suspended from above.	Suspended (pendant) - A luminaire that is hung from a ceiling by supports	Use IES
Radiant Power is the time-rate-flow of radiant energy.	The time rate of flow of radiant energy. It is expressed preferably	Use IES

	in watts.	
Radiant Energy is the electromagnetic or photonic radiant energy from a source.	Radiant energy is energy traveling in the form of electromagnetic waves. It is measured in units of energy such as joules or kilowatt hours.	Use IES
Recessed Luminaire is a luminaire that is mounted above the ceiling or behind a wall or other surface with the opening of the luminaire level with the interior surface.	A luminaire that is mounted above the ceiling (or behind a wall or other surface) with the opening of the luminaire level with the surface.	As noted in our comments: The intent of this definition within the standard should only apply to recessed downlights. Either change the definition to include downlights only or change the reference in the Standard from “recessed luminaire” to “recessed downlight”
Multi-Level Lighting Control reduces power going to a lighting system in multiple steps.	None	A lighting control strategy that provides at least three light levels—one at full-ON and two at lower levels. This may include turning off some portion of the lighting so that uniform light level and distribution is maintained. In addition to the three ON settings, multi-level control may provide for full-OFF. Continuous dimming systems meet this requirement. Also known as multi-level switching or stepped switching. ⁴
Photo Control automatically turns lights ON and OFF, or automatically adjusts lighting levels, in response to the amount of daylight that is available. A Photo Control may also be one component of a field assembled lighting system, the component having the capability to provide a signal proportional to the amount of daylight to a Lighting Control System to continuously dim or brighten the electric lights in response.	A photoelectric switch that controls lighting by the level of daylight illuminance.	Strike CEC word “continuously”. (Cite the T8 requirements for step dim.)

⁴ This definition is from NEMA White Paper LSD-64, “Lighting Controls Terminology” <http://www.nema.org/Standards/Pages/Lighting-Controls-Terminology.aspx>