



July 16, 2008

Mr. Gary Flamm
Docket No. 07-AAER-3
California Energy Commission
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

RE: Docket No. 07-AAER-3, NEMA Response to CEC Proposed Regulation for Metal Halide Luminaires.

Dear Mr. Flamm:

The National Electrical Manufacturers Association (NEMA) Lighting Systems Division appreciates the opportunity to comment on the Title 20 -2008 45-day code proposals. The following comments relate to the code proposals for Metal Halide Luminaires.

The members of NEMA have been very engaged with the California Energy Commission for several years to work in a more collaborative manner and achieve greater reductions in energy use for lighting systems. We have met with staff and Commissioners and felt that we were making significant process to open communications and collaboration. We have submitted proposals that were thoroughly evaluated in terms of technological feasibility, economically justified and achieve significant reductions in energy.

However, we are confused and extremely concerned with the regulatory process that is transpiring with the recent Title 20 2008 code development. The proposed language for the 45-day code is radically different from any previous discussions. In some cases, code language that we have not seen or discussed has been integrated and we have been provided less than a week to respond. There are elements of these code proposals that regulate products that do not exist today and are not likely to be achievable in the future. We are also disappointed that the majority of our comments have not been incorporated in the manner in which they were intended and the analysis required to verify the energy savings, availability of technologies and economic justification have not been conducted.

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METAL HALIDE LUMINAIRES

- (1) The original intent of the NEMA proposal was to provide code language that offered flexibility to achieve the greatest energy savings potential that could cover a variety of applications. This proposal allowed three options: utilize a high efficiency ballast, utilize occupancy sensor controls for industrial lighting or utilize a high efficacy lamp. The original language has been expanded far beyond the intent and is now unacceptable because it places requirements on applications where the technology is not feasible or effective. We strongly urge you to revert to our original scope to enact language that achieves significant energy savings, can be easily enforced and is technologically feasible.
 - a. The specific inclusion of daylight control for MH luminaires is very problematic. The proposal as written will at best require commissioning to function properly and at worst will not be feasible. For MH systems, a daylight sensor is typically located to optimize the measurement of light from the skylight or fenestration. Based on the definition of an “integral control”, the sensor would need to be mounted on or near the luminaire that it controls. Since all luminaires would be required to be equipped with an integral control, the sensor may or may not be directly under a skylight. A 'closed loop' control scheme would need to be used where the light sensor is mounted so that it senses both the light that it controls and the incident sunlight in the space. Because indoor Metal Halide luminaires are typically mounted at higher mounting heights, it becomes problematic for the sensor to have the necessary range and resolution to differentiate between daylight and the electric lighting. In addition, this type of system would likely need to have each sensor individually calibrated to determine the “150% of design illumination” level. The added complexity of this calibration cannot guarantee the energy savings since it would need to be adjusted at installation for the application variations and cannot be preset. The methods described here are not an effective method used for applications intended for daylight integration. We recommend removing the language related to automatic daylight control.
 - b. We recognize that there are some trial installations of MH outdoor luminaires utilizing occupancy sensors. Our original code proposal encouraged this opportunity for energy savings. However, with the addition of the strict definition of “integral control”, these outdoor systems do not incorporate the control in the luminaire or on a wire whip. We recognize that it is difficult to regulate a system that is shipped and installed with external components under Title 20. Because the proper sensor installation is not always in the luminaire housing or hardwired to a whip, and because wireless radio controls are not cost justified, we recommend reverting to the original scope to allow controls only for indoor luminaires.
 - c. The additional requirement for a second stage for occupancy sensors to turn the lighting off when the area has operated at the low level for more than 30 minutes is not acceptable in many applications since the MH luminaire will not immediately ignite to acceptable light levels.
- (2) The wattage ranges described for the minimum ballast efficiency are not consistent with federal standards and are not justified to obtain incremental energy savings. EISA requires a 90% minimum ballast efficiency for 150-250 watt lamps and 92% minimum ballast efficiency for 251-500 watts. California is proposing wattage ranges of 150-274 and 275-500 watts. We are not aware of any MH lamps on the commercial market that are in the 251-274 watt range and do not understand the need for this variation from the federal standards. We further believe that there will be a benefit from the federal energy labeling since there is a

history of non-enforcement of Title 20 in California. We recognize that CEC is recommending only the ballast efficiencies that correspond to the electronic ballast requirement in EISA; however the combination of the FTC circle E label and description of the ballast type will enable California inspectors to more readily verify that a ballast meets the necessary Title 20 requirements. NEMA will not support a California specific label or wattage ranges that differ from the federal requirements.

- (3) The option to meet the Title 20 requirements by using a high efficacy lamp were originally proposed by CEC and were described as a method that would prevent the use of a “full wattage” MH lamp – i.e. 175, 250 or 400 watts. The NEMA proposal attempted to simply the language consistent with CEC’s intent. The modified language in the proposed 45-day code is confusing and precludes some low wattage lamps such as the 350 watt MH. It may also preclude new lamp technologies in the future that provide a higher efficacy and greater energy savings. It is not reasonable to assume that a 320 watt lamp would be a direct replacement for a 400 watt in many applications and it is very feasible that an installation would simply use more 320 watt luminaires in order to achieve the necessary lighting performance, at a higher energy use than a 350 watt or 400 watt system. We recommend that you incorporate the simplified language we have previously proposed.
- (4) The Tier II 2014 proposal has not been presented or discussed prior to this 45-day code proposal and we are quite honestly shocked at the suggestion of requiring high efficiency ballasts and controls for all MH luminaires without any discussion with industry. We believe it is completely inappropriate to introduce new code language this late in the process, especially such a radical departure from our previous discussions. NEMA has provided detailed technical concerns associated with requiring electronic ballasts for outdoor products or for indoor products exposed to high temperatures. These technical issues related to electronic components have not been solved by other industries, so there is no reason to believe the lighting industry will resolve these significant concerns by 2014. These technical concerns will continue to exist regardless of the date of enactment of the Title 20 requirements and are reiterated below:
 - Life testing has not demonstrated that electronic ballasts will withstand the outdoor environment with respect to moisture or temperature.
 - Electronic ballasts’ immunity to transients is not nearly as good as magnetic ballasts. Immunity to transients is very important, especially in outdoor applications. Magnetic ballasts can typically withstand transient voltages many thousands of volts higher than available electronic ballasts.
 - The lower temperature limits of electronic ballasts will not allow them in high ambient applications and makes it very difficult if not impossible to use them in many existing luminaires (indoor and outdoor) without redesigning the luminaires.
 - Some new lamp technologies, such as Ceramic Metal Halide, are not compatible with existing high frequency electronic ballasts.
 - Lamp compatibility issues remain a major concern, including manufacturer-to-manufacturer variations, old versus new lamps, starting voltages, etc; since ANSI standards for electronic ballasts have not been finalized. Completion of ANSI standards, which are needed to assure compatibility, will take at least another 3 years. A code requiring electronic ballasts for all MH luminaires cannot be mandated until this ANSI standard is complete.
 - The problems outlined above are cumulative. Ballasts must be designed, tested, and proven to be compatible with lamps and reliable before fixture designs can be modified to

accommodate them. Widespread use of electronic ballasts only makes sense once qualified suppliers have several years of proven success and appropriate capacity.

There is no assurance that these technical issues can be addressed for certain types of luminaires and applications. There has not been any cost analysis to verify the economic feasibility of high efficiency ballasts, much less high efficiency ballasts that must incorporate dimming capabilities. Furthermore, this proposal introduces an entirely new set of concerns related to applications where dimming may not be recommended at any time – such as roadway lighting, sports lighting or security areas. There have not been any studies of the effectiveness of automatic dimming and safety and security issues associated with outdoor lighting.

The 2014 proposal is completely unacceptable. The technology does not exist and there is no determination of what the cost impact would be to citizens of California. It is much too late in the code development process to introduce such a significant change and we are disappointed that this appears to be an attempt to throw additional requirements into the code process in the eleventh hour without consideration of the technological feasibility, economic justification or energy savings potential. This section of the proposed code should be removed.

PROPOSED 45-DAY CODE LANGUAGE FOR MH LUMINAIRES

“Integral Control” means an Occupancy Sensor that is packaged and shipped with the luminaire, and is integrated into the luminaire at the factory in one of the following three methods:

- (1) Is integrated directly into the luminaire housing and hardwired to the lighting system;
or
- (2) Is hardwired to one end of a wire whip, where the other end of the wire whip is hardwired directly to the lighting system in the luminaire; or
- (3) Uses a wireless radio controlled sensor, where a wireless control is hardwired directly to the lighting system.

“Occupant Sensor Lighting” is a device that automatically reduces lighting or turns lights off soon after an area is vacated.

1605.3 (n) Luminaires.

(2) Energy Efficiency Standard for Metal Halide Luminaires. Metal Halide Luminaires rated for 150 to 500 watts manufactured on or after January 1, 2012 shall not contain probe-start ballasts and shall comply with either A or B:

- A. Shall contain a ballast with a minimum efficiency as follows:
 1. 90 percent minimum ballast efficiency for 150 to 250 watt lamps

2. 92 percent minimum ballast efficiency for 251 to 500 watt lamps
- B. Shall contain a ballast with a minimum efficiency of 88 percent and shall comply with either 1 or 2:
1. Luminaires rated for indoor use shall have an Occupancy Sensor, which is an Integral Control as defined in section 1602(n), shipped with a factory default setting to automatically reduce nominal lamp power by at least 40 percent when the area has been vacated for up to 30 minutes or less.
 2. Luminaires shall be equipped with ballast rated for use up with 150 to 500 watt lamps, excluding 175 watt 250 watt and 400 watt lamps.

Exceptions to Section 1605.3(n)(2)(A and B):

1. Luminaires that use electronic ballasts which operate at 480 volts are not required to comply with the minimum ballast efficiency requirements
2. Luminaires with regulated lag ballasts are not required to comply with the minimum ballast efficiency requirements
3. Luminaires that:
 - a. are rated only for 150 watt lamps; and
 - b. are rated for use in wet locations, as specified by the National Electrical Code 2002, section 410.4(A); and
 - c. contain a ballast that is rated to operate at ambient air temperatures above 50 degrees C, as specified by UL 1029-2001.

As always, NEMA appreciates the attentiveness and cooperation of the CEC. As reading our comments, should any questions arise, please feel free to contact Dain Hansen at (703) 841-3200.

Sincerely,



Kyle Pitsor
Vice President,
NEMA Government Relations