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May 29, 2008

Mr. Harinder Singh  
California Energy Commission  
Buildings and Appliances Office,  
1516 Ninth Street, MS-25  
Sacramento, CA 95814-5512

Docket Number: 07-AAER-3, Part B  
Subject: 2008 Rulemaking Proceeding on Appliance Efficiency Regulations

Dear Mr. Singh,

Thank you for the opportunity to submit comments for the 2008 Rulemaking Proceeding on Appliance Efficiency Regulations. These comments are specific to the proposed code changes related to Metal Halide Luminaires. As you are aware, the members of the National Electrical Manufacturers Association (NEMA) represent over 80% of the sales of Metal Halide products into the state of California and we can be a significant assistance in helping California realize your energy saving goals.

NEMA is the trade association of choice for the electrical manufacturing industry. Founded in 1926 and headquartered near Washington, D.C., its approximately 450 member companies manufacture products used in the generation, transmission and distribution, control and end-use of electricity, including the lamps included within this rulemaking.

The following are comments specific to the proposed code changes related to Metal Halide Luminaires:

It is the NEMA position that the proposed changes to Title 20 requirements for metal halide luminaires will not realize the most immediate, achievable improvements in cost savings and energy efficiency available for lighting products. The currently proposed efficiency standards will require either electronic ballasts or significantly redesigned magnetic ballasts for all products and all applications. There has been significant progress in the development of electronic ballasts for specific applications. However a full line of high efficiency electronic ballasts with proven reliability that will support all applications is not anticipated until around 2015. It is premature at this time to require electronics for all applications and the costs prohibit the redesign of existing magnetic ballasts. This is the reason the federal requirements in EISA 2007 allowed for various ballast efficiency levels for specific ballast technologies.

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NEMA proposes that the California Energy Commission focus on the substantial opportunities to achieve energy savings through lighting in Title 24 where specific application characteristics can be appropriately addressed and where technologies can be leveraged to greater energy savings where those technologies have proven market reliability.

While we do not recommend a continuing progression of lighting standards in Title 20, we are willing to discuss potential options that can achieve a greater impact on energy savings. We recommend that you keep the present pulse start ballast efficiency level of 88% and add a dimming requirement for specific product types. Many dimming capabilities can generate more energy savings, providing immediate impact to the goals of AB1109, with readily available luminaires. We are preparing an energy and cost analysis and will be glad to share this study with you when it is complete.

The currently proposed efficiency standards present several concerns that relate to the technological feasibility, availability and cost effectiveness of the proposal. These concerns are outlined below.

**Redesigned Magnetic Ballasts:**

- Efficiencies proposed by the regulations have the potential to eliminate a majority of magnetic ballasts models that are on the market today. For those models that can be redesigned to achieve these efficiencies, the physical size of the ballasts would need to increase significantly. This would result in the use of more copper and steel as well as a higher quality of steel used in the magnetic cores, resulting in an undetermined incremental cost.
- The increased size of more efficient ballasts would ultimately result in larger, more costly luminaires. The luminaires cannot be redesigned to accommodate larger ballasts until the ballast redesigns are complete. Once the luminaire is redesigned, they must be retested and certified by UL. The timeline for completion of redesign extends well beyond 2010.

**Electronic Ballasts:**

- Wattages below 150 watt are readily available in the market place and are designed primarily for retail applications. High wattage electronic ballasts (above 150W) are not generally available with proven reliability or capacity to serve the general market.
- In general, life testing has not demonstrated that electronic ballasts will withstand the outdoor environment with respect to moisture or temperature. All outdoor lighting would need to be exempt from a ballast efficiency standard requiring electronic ballasts.
- 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. Again, all outdoor lighting would need to be exempt from a ballast efficiency standard requiring 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. Luminaires rated for high ambient temperatures would need to be exempt from a ballast efficiency standard requiring electronic ballasts.
- Some new lamp technologies, such as ceramic metal halide, are not consistently compatible with existing high frequency electronic ballasts. Luminaires using ceramic metal halide lamps would need to be exempt from a ballast efficiency standard requiring electronic ballasts.
- Lamp compatibility issues remain a major concern, including manufacturer-to-manufacturer variations, old versus new lamps, starting voltages, ceramic versus quartz metal halide, 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 3-5 years. A code requiring electronic ballasts for all products cannot be effectively implemented 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.
- California has demonstrated a lack of enforcement of the current code requirements for metal halide luminaires, which creates an unfair marketplace for manufacturers who comply with the standard. Furthermore, the state of California is not yet achieving the expected energy reductions from the current code requirements. The current code proposal would impose more stringent requirements and will likely result in a lower degree of compliance within the marketplace.

**Proposed Title 20 Solution:**

NEMA considers that a luminaire utilizing dimming in conjunction with occupancy sensing, timing devices and/or daylight harvesting will result in dramatically higher energy savings compared with an increase in ballast efficiency from 88% to 92%. We propose that the existing ballast efficiency requirement of 88% be maintained and that a requirement for metal halide high bay and low bay luminaires to possess the capability of reducing the power by a minimum of 40% be incorporated. Step dimming capabilities for high bay and low bay applications are a proven technology. These applications represent significant square footage and high energy use in California. These applications can result in greater overall energy reductions than the proposal for a higher ballast efficiency. In addition, this proposal supports the use of electronic ballasts for those applications where the performance and cost effectiveness meets the requirements for the installation.

Proposed code revision:

**Metal Halide Lamp Fixtures.**

(A) Metal halide lamp fixtures designed to be operated with lamps rated greater than or equal to 150 watts but less than or equal to 500 watts, manufactured on or after January 1, 2009, shall contain metal halide ballasts with a minimum ballast efficiency of 88 percent.

(B) Metal halide high bay and low bay fixtures for interior applications, manufactured on or after January 1, 2010, shall incorporate the capability of reducing the luminaire power through dimming by a minimum of 40%

Subsections (A) and (B) do not apply to any metal halide lamp fixture:

1. with regulated lag ballasts;
2. that uses electronic ballasts that operate at 480 volts; or
3. that (i) are rated only for 150 watt lamps; (ii) are rated for use in wet locations, as specified by the National Electrical Code 2002, Section 410.4(A); and (iii) are used in an environment where the luminaire ambient temperature exceeds 50°C.

As this rulemaking moves towards finalization, NEMA looks forward to continue working with the California Energy Commission in defining system approaches that will allow California to meet its energy reduction goals through multiple effective means. If you need any additional information, please contact Dain Hansen at (703) 841-3221 or [dain.hansen@nema.org](mailto:dain.hansen@nema.org).

Sincerely,



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