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THE NATIONAL FIRE PROTECTION Association (NFPA) develops and administers more than 300 consensus standards and codes intended to ensure safety and minimize the risk of fire. NFPA 70 is the National Electrical Code, often referred to simply as the NEC. Installation requirements contained in the NEC cover a broad range of environments and structures. First published in 1897, the NEC is revised by an open consensus process every three years.

More than 450 volunteer members and alternates across 19 code making panels deliberate and vote on whether to accept the many proposals for revision submitted for each code revision cycle. Revisions to the 2002 NEC, the most recent version of the code, were recently approved. The new version, the 2005 NEC, will be undergoing initial publication as you read this article.

LD+A readers should be aware of two significant changes reflected in the 2005 NEC that will impact the future installation requirements for two commonly encountered lighting applications.

Implications For Lighting Professionals

Although some version of the NEC is enforced in all 50 states, not all state or local governments adopt a revised edition immediately. Some adopt the revised NEC relatively quickly, while others may continue to administer and enforce a prior version for some years. Lighting professionals should understand these two new provisions

for lighting installations, whether or not they do business in a state that has yet adopted the revised NEC, since both provisions will influence and limit allowable mercury vapor and metal halide equipment options as the 2005 version is adopted. Once adopted in a jurisdiction, electrical inspectors will apply the requirements of the 2005 NEC as part of the inspection process for new construction and renovations that require an electrical permit.

Luminaires For Indoor Sports, Mixed Use and All-Purpose Facilities

Newly adopted Article 410.4(E) provides that mercury vapor or metal halide luminaires in the playing and spectator areas of indoor sports, mixed use and all-purpose facilities, which are subject to physical damage, must be of a type that protects the lamp with a glass or plastic lens. So-called “open luminaires” will not be permitted. An additional mechanical guard, such as an external screen or cage, which might prevent a ball from striking the luminaire is permitted but it is not a substitute for the required lens.

This new requirement is intended to minimize the UV exposure risk to athletes and spectators that sometimes occurs when athletes, typically in scholastic facilities, inadvertently break the outer jacket of a high pressure mercury or metal halide lamp that does not have a self extinguishing feature. In such cases the lamp arc tube may continue to operate even though the outer jacket, which normally attenuates UV from the arc

tube, has been shattered.

Play may be stopped while glass from the outer envelope is cleaned up, but then it resumes. As a result, it is possible for those closest to the luminaire with the damaged lamp, especially spectators who may be in an elevated seating situation (such as bleacher seating), to develop eye or skin irritation from the UV emitted by the still operating arc tube. Although incidents are relatively few in number, they continue despite attempts by the industry to educate school personnel about this issue. A desire to minimize this situation prompted the members of Code Making Panel 18, who deliberate and ultimately vote to accept or reject code proposals for lighting installations, to adopt this new provision.

Open Luminaires Using Metal Halide Lamps

Recently adopted Article 410.73 (F)(5) requires that metal halide luminaires be provided with either a containment barrier that encloses the lamp (typically an “enclosed luminaire”) or with a means (typically a special lampholder) that will permit the luminaire to operate only with an ANSI Type-O metal halide lamp. Metal halide lamps designated as Type-O meet the containment testing requirements of ANSI Standard C78.387. Typically, conformance to this standard is achieved by surrounding the metal halide arc tube with a protective quartz sleeve, which prevents hot arc tube particles from being ejected from the luminaire in the event of a lamp rupture during operation.

Metal Halide Lamp Classifications

Every metal halide lamp is classified by the lamp manufacturer as to the recommended manner in which it should be used. The following are the three American National Standards Institute (ANSI) classifications:

1. Lamps classified as **Type-E** are to be used only in suitably rated enclosed luminaires, in accordance with UL 1598 and CSA C22.2 No. 250.0.
2. Lamps classified as **Type-S** have historically been used in both open and enclosed luminaires. Their use in open luminaires is restricted to operation in the vertical position. This category is limited to certain lamps in a 360- to 1000-watt range. A change in the 2005 NEC will eliminate the option of using Type-S lamps in open luminaires in those (new) installations regulated by the NEC.
3. Lamps classified as **Type-O** may be used in open luminaires. Type-O lamps comply with ANSI Standard C78.387 for containment testing.

RULES & REGS

This requirement does not apply to open luminaires that utilize thick-glass parabolic reflector (PAR) lamps since the Code accepts that the thick-glass outer jacket serves as a suitable containment barrier in such applications.

As a result of this new requirement, open luminaires specified in localities that have adopted the 2005 NEC will accept only Type-O lamps since they will employ a special lamp base and lampholder combination that prevents Type-E and Type-S lamps from making electrical contact.

Consequently, in those jurisdictions that adopt the 2005 NEC, the historically common Type-S lamp will not be an option for open luminaires in new construction or in major lighting renovations within existing buildings.

This new requirement is intended to minimize the potential for, and the risk that can occur in the event of, a Type-S metal halide lamp rupture, especially if the application is inappropriate or operation of the lighting system is not in conformance with warn-

ings and instructions provided by manufacturers.

Existing installations that use open luminaires and Type-S metal halide lamps may continue to remain in service, even in localities that adopt the 2005 NEC unless they are converted by their owners. Type-S replacement lamps will continue to be available for those users who wish to keep using Type-S lamps in their existing luminaires. When operated in accordance with manufacturers' warnings and instructions, open luminaires with Type-S lamps have historically been, and remain, a safe and effective lighting option for appropriate applications. However, if users of existing open luminaires wish to migrate to lamps that offer an integral containment barrier, Type-O lamps can be used in these products without replacing the lampholder.

Existing enclosed luminaires will continue to accommodate Type-O, S, or E lamps without any lampholder change.

The impact of the 2005 NEC will

be to require future metal halide installations to utilize either enclosed luminaires with Type-E lamps or open luminaires with Type-O lamps.

Additional Resources: For more information on the 2005 NEC, contact the NFPA or go to www.NFPA.org. For more information on metal halide best practices including implications of the 2005 NEC contact NEMA or go to www.NEMA.org.

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