Emergency Lighting and Exit Sign Requirements – Quick Tips

There are numerous regulatory agencies and codes that govern emergency lighting and exit sign requirements. These regulating authorities include the Occupational Safety and Health Administration (OSHA), National Fire Protection Association (NFPA), Joint Commission on Accreditation of Healthcare Organizations (JCAHO), International Building Code and International Fire Code. Above and beyond the requirements of these agencies, employers must also follow the requirements of their local authority having jurisdiction (AHJ). The local AHJ is whoever's responsible for monitoring and enforcing local building codes and/or fire codes. Some large cities, such as New York City and Chicago, have their own unique codes and requirements for exit signs and emergency lighting. For employers unsure of who to reach out to regarding local emergency exit requirements, the local fire marshal or inspector is a good starting point.

Under 29 Code of Federal Regulation (CFR) 1910.34(c) OSHA defines "exit route" as, "a continuous and unobstructed path of exit travel from any point within a workplace to a place of safety (including refuge areas)." An exit route includes all vertical and horizontal areas along the route and consists of the following three parts:

- **Exit access–**means that portion of an exit route that leads to an exit. An example of an exit access is a corridor on the fifth floor of an office building that leads to a two-hour fire resistance-rated enclosed stairway (the Exit).
- **Exit–**means that portion of an exit route that is generally separated from other areas to provide a protected way of travel to the exit discharge. An example of an exit is a two-hour fire resistance-rated enclosed stairway that leads from the fifth floor of an office building to the outside of the building.
- **Exit Discharge–**means the part of the exit route that leads

directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside. An example of an exit discharge is a door at the bottom of a two-hour fire resistance-rated enclosed stairway that discharges to a place of safety outside the building.

OSHA's requirements for lighting and marking exit routes are covered under 1910.37(b). It states that each exit route must be adequately lighted so that an employee with normal vision can see along the exit route and each exit must be clearly visible and marked by a sign reading "Exit." Additional requirements include the following:

- Each exit route door must be free of decorations or signs that obscure the visibility of the exit route door.
- If the direction of travel to the exit or exit discharge is not immediately apparent, signs must be posted along the exit access indicating the direction of travel to the nearest exit and exit discharge. Additionally, the line-of-sight to an exit sign must clearly be visible at all times.
- Each doorway or passage along an exit access that could be mistaken for an exit must be marked "Not an Exit" or similar designation, or be identified by a sign indicating its actual use (e.g., closet).
- Each exit sign must be illuminated to a surface value of at least five foot-candles (54 lux) by a reliable light source and be distinctive in color. Self-luminous or electroluminescent signs that have a minimum luminance surface value of at least .06-foot-lamberts are permitted.
- Each exit sign must have the word "Exit" in plainly legible letters not less than six inches (15.2 centimeters (cm)) high, with the principal strokes of the letters in the word "Exit" not less than 3/4- inch (1.9 cm) wide.

OSHA makes reference to its acceptance of the NFPA's emergency exit requirements under 1910.35, where it notes that employers who are following the exit-route provisions of NFPA 101, *Life Safety Code*, meet OSHA's requirements. OSHA also acknowledges that those following the International Code Council's, *International Fire Code*, satisfy OSHA's compliance requirements. The latest editions

of both the *Life Safety Code* and *International Fire Code* were published in 2015.

NFPA's Exit Sign Requirements

Additional guidance regarding exit signs is provided within the 2015 edition of NFPA 101, Life Safety Code, section 7.10. It contains details regarding the placement, visibility and acceptable forms of illumination for exit signs. Among the placement requirements it states that any new exit signs must be located so that no point in an exit access corridor is in excess of the sign's rated viewing distance or 100-feet, whichever is less, from the nearest sign. And exit signs with directional indicators must be placed in every location where the direction of travel to reach the nearest exit is not apparent.

Regarding the visibility of exit signs, the NFPA states that every sign must be located and of such size, distinctive color, and design that it is readily visible and must contrast with the background where it's placed. It continues by stating, "No decorations, furnishings, or equipment that impairs visibility of a sign shall be permitted. No brightly illuminated sign (for other than exit purposes), display, or object in or near the line of vision of the required exit sign that could distract attention from the exit sign shall be permitted."

The *Life Safety Code* offers many details regarding acceptable illumination of exit signs. Under section 7.10.1.2 it states that all exit signs must be illuminated by a reliable light source and must be legible in both normal and emergency exit lighting modes. Section 7.10 breaks illumination into two broad categories: externally illuminated and internally illuminated. Externally illuminated refers to a source of illumination that comes from outside the exit sign while internally illuminated exit signs possess the illumination source inside the sign.

For externally illuminated signs, the *Life Safety Code* section 7.10.6.3 requires a level of illumination of not less than five foot-candles (54 lux) at the illuminated surface and a contrast ratio of not less than five-tenths.

Internally illuminated signs must be listed in accordance with the American National Standards Institute (ANSI)/Underwriters Laboratory (UL) 924, *Standard for Emergency Lighting and Power Equipment*. The *Life Safety Code* does allow for three exceptions to this for certain approved existing exit signs (section 7.10.7.1). The exceptions are:

- They are approved existing signs.
- They are existing signs having the required wording in legible letters not less than four inches (100 millimeter (mm)) high.
- They are signs that are in accordance with Exit Door Tactile Signage (7.10.1.3) and Floor Proximity Exit Signs (7.10.1.6).

Also under internally illuminated, the Life Safety Code section 7.10.7.2 details the illumination requirements for photoluminescent signs. Photoluminescent is defined as "having the ability to store incident electromagnetic radiation typically from ambient light sources, and release it in the form of visible light." Photoluminescent signs must be continually illuminate while the building is occupied; the charging illumination must be a reliable light source as determined by the AHJ.

Emergency Lighting Requirements

Sometimes referred to as egress lighting, emergency lighting is designed to illuminate and identify hallways, stairwells and exits to facilitate a safe and orderly evacuation from a facility. Emergency lighting is generally required in all commercial, industrial, educational, religious, institutional, public housing, medical and many other facilities whether for-profit or non-profit. And while OSHA does not have any regulations specific to emergency lighting, the NFPA's *Life Safety Code* addresses the topic in detail. The local AHJ is the best resource to answer emergency lighting compliance questions related to your specific occupancy.

Within the Life Safety Code, the NFPA's requirements for emergency lighting are referenced under section 7.9. Emergency illumination

(when required) must be provided for a minimum of 1.5-hours in the event of failure of normal lighting. The emergency lighting must be arranged to provide initial illumination of not less than an average of one foot-candle (10.8-lux) and a minimum at any point of 0.1-foot-candle (1.1-lux) measured along the path of egress at floor level. These levels can decline to a minimum of 0.6-foot-candle (6.5-lux) average and 0.06-foot-candle (0.65-lux) at any one point at the end of emergency lighting time (1.5-hours). The maximum illumination at any one point can be no more than 40 times the minimum illumination at any one point to prevent excessively bright and dark spots (section 7.9.2.1.3). And the emergency lighting system must be arranged to provide illumination automatically in the event of any interruption of normal lighting (section 7.9.2.3).

Testing Requirements for Emergency Lighting

Section 7.9.3, of the *Life Safety Code*, addresses the NFPA's requirements for periodic testing of emergency lights. The section acknowledges three different categories of emergency lights: traditional, self-testing/self-diagnostic and computer based self-testing/self-diagnostic. It essentially requires both a monthly activation test, where the lights remain illuminated for a minimum of 30-seconds, and an annual test where the lights are activated for 1.5-hours to simulate a long term emergency event. Written records of the monthly and annual tests must be maintained for inspection by the AHJ. Computer based emergency lighting systems must be capable of generating a self-report of testing at all times. Again, best to check with your AHJ to ensure your testing and recording keeping program is sufficient.

Definitions and Formulas

The intensity of visible light is measured in units of candles. The rate of flow of light (luminous flux) is measured in lumens. One lumen is the flux on one square foot of a sphere, one foot in radius with a light source of one candle at the center, and radiating uniformly in all directions. Both foot-candle and lux are measurements of light intensity on a surface. One foot-candle is the intensity of one candle at a distance of one foot away onto

a one square foot surface. Lux is essentially the metric equivalent. It is the intensity of one candle at a distance of one meter away onto a one square meter surface. Foot lambert is the unit measure of physical brightness on any surface emitting or reflecting visible light.

Foot-candles	X 10.764	=	lumens/sq. meter
Foot-candles	X 10.764	=	lux
Lumens/sq. ft.	X 1	=	foot-candles
Lumens/sq. ft.	X 10.764	=	lumens/sq. meter
Lumens	X 0.07958	=	spherical candle power
Lux	X 0.0929	=	foot-candles
Lambert	X 0.3183	=	candles/sq. cm
Lambert	X 295.720	=	candles sq. ft.
Lambert	X 1	=	lumens/sq. cm

Summary

Emergency lights and exit signs often do not get much attention until they are needed. To ensure a safe evacuation in an emergency:

- Make sure that all exit paths are adequately lit,
- Post appropriate signage,
- Properly maintain your emergency lights and exit signs, and
- Perform monthly and annual inspection and keep your records up to date.

Frequently Asked Questions

Q: Is there a requirement for exit sign color? Some facilities have green, other facilities have red.

A: There is no OSHA requirement for specific colors; however, OSHA states it must be distinctive in color from the background. NFPA 101 Section 7.10.1.8 states "signs must be of a distinctive color and design that is readily visible and shall contrast with decorations, interior finish and other signs." Some states or local jurisdictions may require a certain color. Always best to check with your local AHJ.

Q: When is a "NO EXIT" sign required?

A: OSHA does not require the use of "NO EXIT"; however, guidance is provided in NFPA Life Safety Code 101 Section 7.10.8.3.1: "NO EXIT" sign is needed where "any door, passage, or stairway that is neither an exit nor a way of exit access and that is located or arranged so that it is likely to be mistaken for an exit."

Sources

29 CFR 1910 Subpart E
NFPA 101 Life Safety Code
Fundamentals of Industrial Hygiene, 6th edition

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