

## **Emergency Lights: An Often Overlooked but Critical Component to a Building's Life Safety System**

During an emergency, it is critical that the equipment designed to save lives functions properly. In a car accident, seatbelts and airbags must work. During a fire, the importance of an alarm for early warning and fire extinguishers to stop a small fire from getting out of hand is obvious. Unfortunately, one of the most commonly used – and therefore most important – life safety devices that often goes unnoticed is emergency and exit lighting.

Many fire and life safety systems are kept top-of-mind through code enforcement, fire drills and regular audits. However, emergency and exit lighting is often excluded from these and other life safety system maintenance exercises. This is counter intuitive since emergency lights must function not only during fires, but any time power fails, which occurs more often in the U.S. than any other developed nation in the world.<sup>1</sup> For example, the average U.S. customer loses power for 214 minutes per year. This compares to 70 minutes per year in the United Kingdom, 53 in France, 29 in the Netherlands, 6 in Japan, and 2 in Singapore. In the U.S., the average customer loses power once every 9 months, while the average Japanese customer loses power only once every 20 years.<sup>2</sup>

When outages occur, functioning emergency lighting is key to ensuring the safety of those inside a facility. Without properly operating emergency lights, navigating areas such as stairwells, internal offices, restrooms, storage areas and other spaces with little or no natural light can be dangerous. In addition to helping people exit a building, emergency lighting guides building occupants to safe spaces, first aid cabinets, flashlights and other life-saving equipment. It can also help people locate others who may need assistance. If a fire occurs, emergency lights can be vitally important in safely guiding people to an exit and helping firefighters navigate an unfamiliar building to locate anyone left behind.

It's clear that maintaining emergency lighting is an important part of any life-safety program, but many organizations treat it as an afterthought. This white paper will describe how emergency lights are used, the importance of emergency lights, and share best practices for maintenance based on industry regulations.

### **Emergency Lights Usage**

Emergency lighting is part of a building's life safety system. The purpose of emergency lighting is to ensure that lighting is provided promptly and automatically when the normal

---

<sup>1</sup> <http://www.ibtimes.com/aging-us-power-grid-blacks-out-more-any-other-developed-nation-1631086>

<sup>2</sup> <http://issues.org/22-4/apt-2/>

power supply to lighting fails. This is designed to help people navigate and exit a building safely in the event of a power outage.

People work, eat and live in abundantly lit public spaces. But what if the lighting goes out? Further, what if a power outage is caused by severe weather, a fire, earthquake or other natural disaster? These outages are more common since the number of harsh storms has soared from an average of five per year between the 1950s and 1980s to now, averaging anywhere between 70 and 130 per year.<sup>3</sup> The potential for panic – and injury – could be magnified during these events if people can no longer navigate or exit a building in an orderly manner.

Power outages occur more frequently in the U.S. than many building owners and managers realize:

- In March 2017, a massive wind storm caused **1.1 million** homes and businesses to lose power for days in Michigan.<sup>4</sup> In April 2017, San Francisco experienced a massive power outage, leaving **90,000** people stranded in the dark. Los Angeles and New York City also experienced outages on the same day that left thousands of commuters in dark subway tunnels and drivers without traffic lights.<sup>5</sup>
- Since 2003, **147 million** power customers have lost power for at least an hour from weather-related outages, with an average of **15 million** power customers affected each year.<sup>6</sup>
- Power outages are on the rise. The 5-year annual average of reported outages **doubled** every five years from 2000 to 2014, which means the 2014 annual average is **four times** what it was 15 years ago.<sup>7</sup>
- June is the most common month for severe weather outages, followed by August and July<sup>8</sup>.
- Severe weather and an aging infrastructure aren't the only concerns. Part of the nation's power grid is struck by a cyber or physical attack approximately once every four days, according to a USA TODAY analysis of federal energy records.<sup>9</sup> President Trump also recently issued an executive order on cybersecurity in light of ransomware attacks

---

<sup>3</sup> <http://www.cliffordpower.com/trends-in-power-outages>

<sup>4</sup> <http://www.craigslist.com/article/20170317/NEWS/170319872/michigan-ranks-4th-nationally-for-power-outages>

<sup>5</sup> <https://www.rt.com/usa/385646-blackouts-hit-la-ny-sf/>

<sup>6</sup> <http://assets.climatecentral.org/pdfs/PowerOutages.pdf>

<sup>7</sup> <http://insideenergy.org/2014/08/18/power-outages-on-the-rise-across-the-u-s/>

<sup>8</sup> <http://insideenergy.org/2014/08/18/power-outages-on-the-rise-across-the-u-s/>

<sup>9</sup> <https://www.usatoday.com/story/news/2015/03/24/power-grid-physical-and-cyber-attacks-concern-security-experts/24892471/>

that affected 74 countries which focused largely on protecting the nation's "highly vulnerable" power grid.<sup>10</sup>

### **Importance of Emergency Lights**

Emergency lighting allows people to see clearly, avoid obstacles, locate equipment and move more safely throughout a building during a power outage. Imagine having to get to safety in pitch black conditions. Think of all the areas that would be made more dangerous with limited or no visibility. Now imagine it's a true emergency and time is critical. When the power goes out, it is important that emergency lights work properly.

In addition to safety concerns, numerous codes and regulations exist that building owners are required to meet. These include codes and standards established by the Occupational Safety and Health Administration (OSHA), the National Fire Protection Association (NFPA) and others, depending on the type of facility. Building owners must meet these requirements and potentially others set forth by the local authority having jurisdiction (AHJ). The local AHJ is responsible for monitoring and enforcing building and fire codes.

### **Standards, codes and regulations**

Numerous authorities have issued regulation on emergency lighting. For example, the OSHA Standard 1910.34 (c) defines an exit route as: "a continuous and unobstructed path of travel from any point within a workplace to a place of safety (including refuge areas)."<sup>11</sup> OSHA's requirements for lighting exit routes are included in OSHA standard 1910.37, "Maintenance, safeguards and operational features for exit routes." This standard states that buildings must maintain adequately lighted exit routes and each exit must be identified clearly with a sign reading "exit."<sup>12</sup> The standard also notes that lighting must be adequate for an employee with normal vision to see the route and that the line of sight must always be visible.

---

<sup>10</sup> <https://www.usatoday.com/story/tech/news/2017/05/12/threats-power-outages-special-concern-order-cybersecurity/101593650/>

<sup>11</sup> [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=12886](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12886)

<sup>12</sup> [https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=standards&p\\_id=9725](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9725)

Additional guidance regarding emergency lighting is also provided within NFPA Code 101: Life Safety Code<sup>13</sup>. Within the NFPA Code 101, requirements for emergency lighting are referenced under section 7.9 of the 2015 edition and include:

- Emergency lighting must be provided for a minimum of 90 minutes.
- Emergency lights and exit signs must undergo a test every month where they remain illuminated for at least 30 seconds.
- Emergency lights must be tested annually where they are illuminated for at least 90 minutes to simulate a long-term power outage.
- Emergency lighting must be established to provide illumination automatically in the event of any interruption of normal lighting (section 7.9.2.3).

It is important to thoroughly document and track inspections to demonstrate compliance with these, and other local standards.

### **Best Practices for Emergency Light Maintenance**

Property owners and managers are responsible for assuring that illuminated emergency exit signs and emergency lights are properly maintained. Occupants could be at risk if routine maintenance is neglected, or is not performed by trained individuals with the correct tools, equipment and replacement parts. Building owners may also face significant fines for failing to meet industry standards, in addition to lawsuits and a damaged reputation.

Best practices for emergency light maintenance include:

1. Visually inspect equipment regularly – Any visual irregularity should be further explored to help prevent potential failure. Look for loose or exposed wiring and make sure it is secure. Frayed wiring is a fire hazard and it should be addressed immediately. Ensure that units are mounted to the wall or ceiling securely. If not, this could lead to damage to the unit. Identify cracks or blemishes on lights. While these may be considered cosmetic, outdoor units with cracks may need to be replaced due to water seepage.
2. Conduct monthly inspections – According to NFPA 101, property owners must inspect exit and emergency lights monthly. It is important to check for physical damage to the exterior of the lights, including the test switch, pilot lamp, heads, etc. Verify that the AC ready light is on and that the bulbs on exit signs are illuminated. It is also important to verify that the red or green diffusers on exit signs are not bleached, faded, burnt or

---

<sup>13</sup> <http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards?mode=code&code=101>

cracked. Test the battery back-up by holding the test switch if present for at least 30 seconds, and confirm that the lamps on emergency lights are secure and aligned properly. Record the date of inspection and any maintenance performed.

3. Conduct 90-minute full functional test annually – At least annually, test emergency lighting in true power outage conditions. If possible, cut the power to emergency lights and conduct an initial walk through. Check all lights to ensure they are lit under AC power and make note of which units need repair. Check for physical damage to the units' exterior and verify that the chevrons point in the direction of the exit. After 90 minutes, check the lights again and make note of any other lights that need maintenance. Restore power, check and replace batteries and conduct maintenance as needed.

When a full 90-minute test cannot be completed or is not feasible, local jurisdictions may allow other methods of annual test, including use of a battery analyzer to gain more information on the useful life of the battery. Consult with the local AHJ and professional service providers to help ensure compliance.

4. Maintain diligent records of inspection – Written records of inspection timing and methods should be kept by the building owner for review by the AHJ. Any lights that were not able to be tested should also be documented by location, including the reason a test could not be completed. This will provide documentation that equipment is up to standards and may help building owners avoid costly fines.

### **Lighting the Way to Safety**

Emergency and exit light maintenance is a critical component of any organization's life safety program, yet it is often an afterthought. With the prevalence of power outages in the U.S. and the trend only increasing, it is important for building owners to prioritize emergency and exit light maintenance. Further, emergency and exit lights can help building occupants navigate and exit a building more safely during a fire or life safety emergency where power loss occurs.

To simplify the process and ensure compliance with standards, consider outsourcing with an experienced fire safety solutions provider that specializes in equipment testing, inspection and repair. When it comes to building safety, properly operating emergency lights are essential – and organizations should prioritize them along with other elements of their life safety system.

###