

**NATIONAL ELECTRICAL CODE**

**Article 700 \* 1996 Edition**

**Note:** The following excerpts from the National Electrical Code are provided as general information and may be useful as a guide for the selection and layout of emergency lighting systems.

**A. General**

**700-1.Scope.** The provisions of this article apply to the electrical safety of the installation, operation, and maintenance of emergency systems consisting of circuits and equipment intended to supply, distribute, and control electricity for illumination or power, or both, to required facilities when the normal electrical supply or system is interrupted.

Emergency systems are those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any government agency having jurisdiction. These systems are intended to automatically supply illumination or power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life.

**700-2. Application of Other Articles.** Except as modified by this article, all applicable articles of this Code shall apply.

**700-3. Equipment Approval.** All equipment shall be approved for use on emergency systems.

**700-4. Test and Maintenance.**

**a) Conduct or Witness Test.** The authority having jurisdiction shall conduct or witness a test of the complete system upon installation and periodically afterward.

**b) Tested Periodically.** Systems shall be tested periodically on a schedule acceptable to the authority having jurisdiction to ensure the systems are maintained in proper operating condition.

**c) Battery Systems Maintenance.** Where battery systems or unit equipments are involved, including batteries used for starting control, or ignition in auxiliary engines, the authority having jurisdiction shall require periodic maintenance.

**d) Written Record.** A written record shall be kept of such tests and maintenance.

**e) Testing Under Load.** Means for testing all emergency lighting and power systems during maximum anticipated load conditions shall be provided.

**B. Circuit Wiring**

**700-9. Wiring, Emergency System.**

**a) Identification.** All boxes and enclosures (including transfer switches, generators, and power panels) for emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system. The marking may be a color code, the identification "emergency system," or any other type of identification that will identify the box or enclosure as a component of the emergency system.

**b) Wiring.** Wiring from emergency source or emergency source distribution overcurrent protection to emergency loads shall be kept entirely independent of all other wiring and equipment and shall not enter the same raceway, cable, box, or cabinet with other wiring.

**C. Sources of Power**

**700-12. General Requirements.** Current supply shall be such that, in the event of failure of the normal supply to, or within, the building or group of buildings concerned, emergency lighting, emergency power, or both will be available within the time required for the application but not to exceed 10 seconds. The supply system for emergency purposes, in addition to the normal services to the building and meeting the general requirements of this section, shall be permitted to comprise one or more of the types of systems described in (a) through (d) below. Unit equipment in accordance with Section 700-12(e) shall satisfy the applicable requirements of this article.

In selecting an emergency source of power, consideration shall be given to the occupancy and the type of service to be rendered, whether of minimum duration, as for the evacuation of a theater, or longer duration, as for supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building.

Equipment shall be designed and located to minimize the hazards that might cause complete failure due to flooding, fires, icing, and vandalism.

Equipment for sources of power as described in Sections 700-12(a) through (d) where located within assembly occupancies greater than 1000 persons or in buildings above 75 ft. (23 m) in height with any of the following occupancy classes: assembly, educational, residential, detention and correctional, business, and mercantile, shall be installed either in spaces fully protected by approved automatic fire suppression systems (sprinklers, carbon dioxide systems, etc.), or in spaces with a 1-hour fire rating.

**(a) Storage Battery.** Storage batteries used as source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total load for a period of 1 1/2 hours minimum, without the voltage applied to the load falling below 87 1/2 percent of normal.

Batteries, whether of the acid or alkali type, shall be designed and constructed to meet the requirements of emergency service and shall be compatible with the charger for that particular installation.

For a sealed battery, the container shall not be required to be transparent. However, for the lead acid battery that requires water additions, transparent or translucent jars shall be furnished. Automotive type batteries shall not be used. An automatic battery charging means shall be provided.

**(c) Uninterruptible Power Supplies.** Uninterruptible power supplies used to provide power for emergency systems shall comply with the applicable provisions of Sections 700-12(a) and (b).

**(d) Unit Equipment.** Individual unit equipment for emergency illumination shall consist of (1) a rechargeable battery; (2) a battery charging means; (3) provisions for one or more lamps mounted on the equipment, or shall be permitted to have terminals for remote lamps, or both; and (4) a relaying device arranged to energize the lamps automatically upon failure of the supply to the unit equipment. The batteries shall be of suitable rating and capacity to apply and maintain at not less than 87 1/2 percent of the nominal battery voltage for the total lamp load associated with the unit for a period of at least 1 1/2 hours, or the unit equipment shall supply and maintain not less than 60 percent of the initial emergency illumination for a period of at least 1 1/2 hours. Storage batteries, whether of the acid or alkali type, shall be designed and constructed to meet the requirements of emergency service.

Unit equipment may be wired with a flexible cord (not exceeding 3 ft. in length) and attachment plug cap. This equipment must be permanently fixed in place, usually by mounting screws accessible only from within the unit. One or more lamps may be mounted on or remote from the unit. The unit should be located where it can be readily checked or tested for proper performance.

Unit equipment is intended to provide illumination for the area where it is installed. For instance, if a unit is located in a corridor, it is required to be connected to the branch circuit supplying the normal corridor lights (on the line side of any switching arrangements). In the event of loss of normal power, the unit would automatically energize the unit lamps, restoring illumination to the corridor. A separate circuit is not permitted for unit equipment (except as noted in the exception) because, if applied to the above example, failure of the normal corridor circuit would not affect the unit equipment, and the corridor would remain in darkness. The branch circuit feeding the unit must be identified at the panelboard.

**D. Emergency Lighting System Circuits for Lighting and Power**

**700-15. Loads on Emergency Branch Circuits.** No appliances and no lamps, other than those specified as required for emergency use, shall be supplied by emergency lighting circuits.

**700-16. Emergency Illumination.** Emergency illumination shall include all required means of egress lighting, illuminated exit signs, and all other lights specified as necessary to provide required illumination.

Emergency lighting systems shall be so designed and installed that the failure of any individual lighting element, such as the burning out of a light bulb, cannot leave in total darkness any space that requires emergency illumination.

Where high-intensity discharge lighting such as high- and low-pressure sodium, mercury vapor, and metal halide is used as the sole source of normal illumination, the emergency lighting systems shall be required to operate until normal illumination has been restored.

**700-17. Circuits for Emergency Lighting.** Branch circuits that supply emergency lighting shall be installed to provide service from a source complying with Section 700-12 when the normal supply for lighting is interrupted. Such installations shall provide either one of the following: (1) an emergency lighting supply, independent of the general lighting supply, with provisions for automatically transferring the emergency lights upon the event of failure of the general lighting system supply, or (2) two or more separate and complete systems with independent power supply, each system providing sufficient current for emergency lighting purposes. Unless both systems are used for regular lighting purposes and are both kept lighted, means shall be provided for automatically energizing either system upon failure of the other. Either or both systems shall be permitted to be a part of the general lighting system of the protected occupancy if circuits supplying lights for emergency illumination are installed in accordance with other sections of this article.

**700-18. Circuits for Emergency Power.** For branch circuits that supply equipment classed as emergency, there shall be an emergency supply source to which the load will be transferred automatically upon the failure of the normal supply.

