

BFAAM Apprenticeship Program

Period 4

Related Training Instruction (RTI)
Module 6 – NFPA 70 – Chapter 7 Emergency
Systems & Chapter 8 Communications
Systems(Outdoor Wiring)

Reading material associated with this
module: Chapter 7 & 8, NFPA 70,
National Electrical Code (NEC), 2014 Edition

National Electric Code®
Chapter 7 – Article 700 – Emergency Systems

Article 700

Emergency Systems

As referenced by NFPA 72

National Electric Code®

Chapter 7 – Article 700 – Emergency Systems & NFPA 72 Chapter 10 Fundamentals

NFPA 72 2013 Edition: Chapter 10 Fundamentals

10.6.7 Secondary Power Supply.

10.6.7.3 Secondary Power Supply for Protected
Premises Fire Alarm Systems and
Emergency Communications systems.

(2) An automatic starting engine-driven generator serving the dedicated branch circuit and arranged in accordance with 10.6.5.1 and storage batteries dedicated to the fire alarm system with 4 hours of capacity arranged in accordance with 10.6.10.

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Chapter 7 – Article 700 – Emergency Systems & NFPA 72 Chapter 10 Fundamentals

10.6.11.3 Secondary Power Supplies.

10.6.11.3.1 Protected Premises.

10.6.11.3.1.1

Engine-driven generators used to provide secondary power for a protected premises fire alarm system or an emergency communications system shall comply with NFPA 110, Standard for Emergency and Standby Power Systems, Chapter 4, requirements for a **Type 10, Class 24, Level 1 system.**

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Chapter 7 – Article 700 – Emergency Systems & NFPA 72 Chapter 10 Fundamentals

10.6.11.3.1.2

Installation of engine-driven generators used to provide secondary power for a protected premises fire alarm system or emergency communications system shall be in accordance with **NFPA 70, National Electrical Code, Article 700.**

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Chapter 7 – Article 700 – Emergency Systems

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, power, or both, to required facilities when the normal electrical supply or system is interrupted.

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Chapter 7 – Article 700 – Emergency Systems

Informational Note No. 4:

For further information regarding performance of emergency and standby power systems, see NFPA 110-2013, Standard for Emergency and Standby Power Systems.

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 - Chapter 4 - EPSSs

■ NFPA 110

Chapter 4 Classification of Emergency Power Supply Systems (EPSSs)

4.1 General.

The EPSS (Emergency Power Supply System) will provide a source of electrical power of required capacity, reliability and quality to loads for a length of time as specified in Table 4.1(a) and within a specified time following loss or failure of the normal power supply as specified in table 4.1(b)

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 - Chapter 4 - EPSSs

NFPA 110 4.1(a) Classification of EPSSs.

The Class defines the minimum time, in hours, for which the EPSS is designed to operate at its rated load without being refueled.

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 Chapter 4 EPSSs

Table 4.1(a) Classification of EPSSs.

<u>Class</u>	<u>Minimum Time</u>
Class 0.083	0.083 hour (5 minutes)
Class 0.25	0.25 hour (15 minutes)
Class 2	2 hours
Class 6	6 hours
Class 48	48 hours
Class X	Other time, in hours, as required by the application, code, or user

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 - Chapter 4 - EPSSs

NFPA 110 4.1(b) Types of EPSSs.

The type defines the maximum time in seconds that the EPSS will permit the load terminals of the transfer switch to be without acceptable electrical power.

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 - Chapter 4 - EPSSs

Table 4.1(b) Types of EPSSs

<u>Designation</u>	<u>Power Restoration</u>
Type U	Basically uninterruptible (UPS Systems)
Type 10	10 seconds
Type 60	60 seconds
Type 120	120 seconds
Type M	Manual stationary or non-automatic – no time limit

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 - Chapter 4 - EPSSs

NFPA 110 4.4 Level.

Two levels of equipment installations, performance, maintenance, and testing are covered in this document.

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 - Chapter 4 - EPSSs

Level 1 systems are to be installed when failure of the equipment to perform could result in loss of human life or serious injury.

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Chapter 7 – Article 700 – Emergency Systems & NFPA 110 - Chapter 4 - EPSSs

Level 2 systems are to be installed when failure of the EPSS to perform is less critical to human life and safety and where the authority having jurisdiction permits a higher degree of flexibility than provided by a level 1 system.

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Chapter 7 – Article 700 – Emergency Systems

700.2 Definitions.

Emergency Systems. Those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, 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.**

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Chapter 7 – Article 700 – Emergency Systems

Informational Note: Emergency systems are generally installed in places of assembly where artificial illumination is required for safe exiting and for panic control in buildings subject to occupancy by large numbers of persons such as hotels, theaters, sports arenas, health care facilities, and similar institutions. Emergency systems may also provide power for such functions as ventilation where essential to maintain life, fire detection and alarm systems, elevators, fire pumps, public safety communication systems, industrial processes where current interruption would produce serious **life safety or health hazards**, and similar functions.

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Chapter 7 – Article 700 – Emergency Systems

700.3 Tests 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.

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Chapter 7 – Article 700 – Emergency Systems

700.3 Tests and Maintenance - Cont.

(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.

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Chapter 7 – Article 700 – Emergency Systems

700.4 Capacity

(A) Capacity and Rating. An emergency system shall have adequate capacity and rating for all loads to be operated simultaneously. The emergency system equipment shall be suitable for the maximum available fault current at its terminals.

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Chapter 7 – Article 700 – Emergency Systems

700.4 Capacity - Cont.

(B) Selective Load Pickup, Load Shedding, and Peak Load Shaving. The alternate power source shall be permitted to supply emergency systems (Article 700), legally required standby systems (Article 701), and optional standby systems (Article 702) loads where the source has adequate capacity or where automatic selective load pickup and load shedding is provided as needed to ensure adequate power to (1) the emergency circuits, (2) the legally required standby circuits, and (3) the optional standby circuits, in that order of priority.

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Chapter 7 – Article 700 – Emergency Systems

700.4 Capacity - Cont.

The alternate power source shall be permitted to be used for peak load shaving, provided these conditions are met. Peak load shaving operation shall be permitted for satisfying the test requirement of 700.3(B), provided all other conditions of 700.3 are met.

A portable or temporary alternate source shall be available whenever the emergency generator is out of service for major maintenance or repair.

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Chapter 7 – Article 700 – Emergency Systems

700.6 Signals

Audible and visual signal devices shall be provided, where practicable, for the purpose described in 700.6(A) through (D).

(A) Derangement. To indicate derangement of the emergency source.

(B) Carrying Load. To indicate that the battery is carrying load.

(C) Not Functioning. To indicate that the battery charger is not functioning.

(D) Ground Fault.

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Chapter 7 – Article 700 – Emergency Systems

700.7 Signs

(A) Emergency Sources A sign shall be placed at the service-entrance equipment, indicating type and location of on-site emergency power sources.

(B) Grounding Where removal of a grounding or bonding connection in normal power source equipment interrupts the grounding electrode conductor connection to the alternate power source(s) grounded conductor, a warning sign shall be installed at the normal power source equipment stating:

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Chapter 7 – Article 700 – Emergency Systems

700.7 Signs - Cont.

WARNING

**SHOCK HAZARD EXISTS IF GROUNDING
ELECTRODE CONDUCTOR OR BONDING JUMPER
CONNECTION IN THIS EQUIPMENT IS
REMOVED WHILE ALTERNATE SOURCE(S) IS
ENERGIZED.**

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Chapter 7 – Article 700 – Emergency Systems

700.7 Signs - Cont.

WARNING

SHOCK HAZARD EXISTS IF
GROUNDING ELECTRODE
CONDUCTOR OR BONDING JUMPER
CONNECTION IN THIS EQUIPMENT
IS REMOVED WHILE ALTERNATE
SOURCE(S) IS ENGERGIZED

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Chapter 7 – Article 700 – Emergency Systems

700.10 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.

(B) Wiring. Wiring of two or more emergency circuits supplied from the same source shall be permitted in the same raceway, cable, box, or cabinet.

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Chapter 7 – Article 700 – Emergency Systems

700.10 Wiring, Emergency System. – Cont.

Wiring from an emergency source or emergency source distribution overcurrent protection to emergency loads shall be kept entirely independent of all other wiring and equipment, unless otherwise permitted in 700.10(B)

(1) through (5):

- (1) Wiring from the normal power source located in transfer equipment enclosures
- (2) Wiring supplied from two sources in exit or emergency luminaires

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Chapter 7 – Article 700 – Emergency Systems

700.10 Wiring, Emergency System - Cont.

(3) Wiring from two sources in a listed load control relay supplying exit or emergency luminaires, or in a common junction box, attached to exit or emergency luminaires

(4) Wiring within a common junction box attached to unit equipment, containing only the branch circuit supplying the unit equipment and the emergency circuit supplied by the unit equipment

(5) Wiring from an emergency source to supply emergency and other loads in accordance with

700.10(B)(5) a, b, c, & d as follows:

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Chapter 7 – Article 700 – Emergency Systems

700.10 Wiring, Emergency System - Cont.

(D) Fire Protection Emergency systems shall meet the additional requirements in (D)(1) through (D)(3) in assembly occupancies for not less than 1000 persons or in buildings above 23 m (75 ft) in height.

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Chapter 7 – Article 700 – Emergency Systems

700.10 Wiring, Emergency System - Cont.

(1) Feeder-Circuit Wiring. Feeder-circuit wiring shall meet one of the following conditions:

- (1)** Be installed in spaces or areas that are fully protected by an approved automatic fire suppression system
- (2)** Be a listed electrical circuit protective system with a minimum 2-hour fire rating
- (3)** Be protected by a listed thermal barrier system for electrical system components with a minimum 2-hour fire rating
- (4)** Be protected by a listed fire-rated assembly that has a minimum fire rating of 2 hours and contains only emergency wiring circuits.
- (5)** Be encased in a minimum of 50 mm (2 in.) of concrete

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Chapter 7 – Article 700 – Emergency Systems

700.10 Wiring, Emergency System - Cont.

(2) Feeder-Circuit Equipment. Equipment for feeder circuits (including transfer switches, transformers, and panel boards) shall be located either in spaces fully protected by approved automatic fire suppression systems (including sprinklers, carbon dioxide systems) or in spaces with a 2-hour fire resistance rating.

(3) Generator Control Wiring Control conductors installed between the transfer equipment and the emergency generator shall be kept entirely independent of all other wiring and shall meet the conditions of 700.10(D)(1).

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Chapter 7 – Article 700 – Emergency Systems

700.12 Sources of Power 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 shall be available within the time required for the application but not to exceed 10 seconds (**Type 10**). 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 one or more of the types of systems described in 700.12(A) through (E).

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Chapter 7 – Article 700 – Emergency Systems

700.12 Sources of Power General Requirements - Cont.

Unit equipment in accordance with 700.12(F) 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 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 so as to minimize the hazards that might cause complete failure due to flooding, fires, icing, and vandalism.

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Chapter 7 – Article 700 – Emergency Systems

700.12 Sources of Power General Requirements - Cont.

Equipment for sources of power as described in 700.12(A) through (E) where located within assembly occupancies for greater than 1000 persons or in buildings above 23 m (75 ft.) 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, and so forth) or in spaces with a 1-hour fire rating.

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Chapter 7 – Article 700 – Emergency Systems

Emergency 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.

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Chapter 7 – Article 700 – Emergency Systems

Emergency System Circuits for Lighting and Power - Cont.

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.

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Chapter 7 – Article 700 – Emergency Systems

VI. Overcurrent Protection

700.26 Accessibility.

The branch-circuit overcurrent devices in emergency circuits shall be accessible to authorized persons only.

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Chapter 7 – Article 701 – Legally Required Standby Systems & NFPA 72 – Chapter 10 - Fundamentals

Article 701

Legally Required Standby Systems

As referenced by NFPA 72

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Chapter 7 – Article 701 – Legally Required Standby Systems & NFPA 72 – Chapter 10 - Fundamentals

NFPA 72 2010 Edition: Chapter 10 Fundamentals

10.6.7 Secondary Power Supply.

10.6.7.4 Secondary Power Supply for Supervising Station Facilities.

(2) A dedicated branch circuit of an automatic-starting engine-driven generator arranged in accordance with 10.6.11.3.2.1 & 10.6.11.3.2.2 and storage batteries dedicated to the supervising station equipment system with 4 hours of capacity arranged in accordance with 10.6.10.

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Chapter 7 – Article 701 – Legally Required Standby Systems & NFPA 72 – Chapter 10 - Fundamentals

10.6.11.3.2 Supervising Station

10.5.10.3.2.1 Automatic-starting, engine-driven generators used to provide secondary power for a supervising station shall comply with NFPA 110, Standard for Emergency and Standby Power Systems, Chapter 4, requirements for a **Type 60, Class 24, Level 2 system.**

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Chapter 7 – Article 701 – Legally Required Standby Systems & NFPA 72 – Chapter 10 - Fundamentals

10.6.11.3.2.2

Installation of automatic-starting, engine-driven generators used to provide secondary power for a supervising station shall be in accordance with **NFPA 70, National Electrical Code, Article 701.**

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Chapter 7 – Article 701 – Legally Required Standby Systems

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

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.1 Scope. - Cont.

The systems covered by this article consist only of those that are permanently installed in their entirety, including the power source.

Informational Note No. 2: For further information regarding performance of emergency & standby power systems, see NFPA 110-2013.

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.2 Definition.

Legally Required Standby Systems.

Those systems required and so classed as legally required standby by municipal, state, federal, or other codes or by governmental agency having jurisdiction. These systems are intended to automatically supply power to selected loads (other than those classed as emergency systems) in the event of failure of the normal source.

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Chapter 7 – Article 701 – Legally Required Standby Systems

Informational Note: Legally required standby systems are typically installed to serve loads, such as heating & refrigeration systems, communication systems, ventilation and smoke removal systems, sewage disposal, lighting systems, and industrial processes, that, when stopped during any interruption of the normal electrical supply, could create hazards or hamper rescue or fire-fighting operations.

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.3 Tests and Maintenance.

(A) Conduct or Witness Test. The authority having jurisdiction shall conduct or witness a test of the complete system upon installation.

(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.

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.3 Tests and Maintenance - Cont.

(C) Battery Systems Maintenance. Where batteries used for starting, control, or ignition of prime movers, 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 legally required standby systems under load shall be provided.

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.4 Capacity and Rating.

A legally required standby system shall have adequate capacity and rating for the supply of all equipment intended to be operated at one time. Legally required standby system equipment shall be suitable for the maximum available fault current at its terminals.

The legally required standby alternate power source shall be permitted to supply both legally required standby & optional standby system loads under either of the following conditions:

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Chapter 7 – Article 701 – Legally Required Standby Systems

- (1) Where the alternate source has adequate capacity to handle all connected loads
- (2) Where automatic selective load pickup and load shedding is provided that will ensure adequate power to the legally required standby circuits

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.6 Signals

Audible and visual signal devices shall be provided, where practicable, for the purpose described in 701.6(A) through (D).

(A) Derangement. To indicate derangement of the standby source.

(B) Carrying Load. To indicate that the standby source is carrying load.

(C) Not Functioning. To indicate that the battery charger is not functioning.

(D) Ground Fault.

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.7 Signs.

(A) Mandated Standby. A sign shall be placed at the service entrance indicating type and location of on-site legally required power sources.

(B) Grounding. Where removal of a grounding or bonding connection in normal power source equipment interrupts the grounding electrode conductor connection to the alternate power source(s) grounded conductor, a warning sign shall be installed at the normal power source equipment stating:

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.7 Signs - Cont.

WARNING

**SHOCK HAZARD EXISTS IF GROUNDING
ELECTRODE CONDUCTOR OR BONDING
JUMPER CONNECTION IN THIS EQUIPMENT
IS REMOVED WHILE ALTERNATE SOURCE(S)
IS ENERGIZED.**

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.10 Wiring Legally required Standby Systems.

The legally required standby system wiring shall be permitted to occupy the same raceways, cables, boxes, & cabinets with other general wiring.

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Chapter 7 – Article 701 – Legally Required Standby Systems

701.12 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, legally required standby power will be available within the time required for the application but not to exceed

60 seconds (type 60).

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Chapter 7 – Article 701 – Legally Required Standby Systems

Overcurrent Protection

701.25 Accessibility. The branch-circuit overcurrent devices in legally required standby circuits shall be accessible to authorized persons only.

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**Chapter 7 – Article 702 – Optional Standby
Systems**

Article 702

Optional Standby Systems

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Chapter 7 – Article 702 – Optional Standby Systems

702.1 Scope. The provisions of this article apply to the installation and operation of optional standby systems.

The systems covered by this article consist of those that are permanently installed in their entirety, including prime movers, and those that are arranged for a connection to a premises wiring system from a portable alternate power supply.

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Chapter 7 – Article 702 – Optional Standby Systems

702.2 Definition.

Optional Standby Systems. Those systems intended to supply power to public or private facilities or property where **life safety does not depend on the performance of the system.** Optional standby systems are intended to supply onsite generated power to selected loads either automatically or manually.

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Chapter 7

Article 725

**Class I, Class II, and Class III Remote
Controls, Signaling, and Power Limited
Circuits**

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Chapter 7

Article 760

Fire Alarm Systems

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Chapter 7

Article 770

Optical Fiber Cables and Raceways

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Chapter 8 – Communications Circuits

Article 800

Communications Circuits

PLFA circuits are to be treated as communication circuits when they extend beyond a building.

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Chapter 8 – Communications Circuits

800.1 Scope. This article covers communications circuits and equipment.

800.2 Definitions. See Part I of Article 100. For the purposes of this article, the following additional definitions apply.

Abandoned Communications Cable.

Installed communications cable that is not terminated at both ends at a connector or other equipment and not identified for future use with a tag.

Block. A square or portion of a city, town, or village enclosed by streets and including the alleys so enclosed, but not any street.

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Chapter 8 – Communications Circuits

Cable. A factory assembly of two or more conductors having an overall covering.

Cable Sheath. A covering over the conductor assembly that may include one or more metallic members, strength members, or jackets.

Communications Circuit. The circuit that extends voice, audio, video, data, interactive services, telegraph (except radio), **outside wiring for fire alarm and burglar alarm** from the communications utility to the customer's communications equipment up to and including terminal equipment such as a telephone, fax machine, or answering machine.

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Chapter 8 – Communications Circuits

Communications Circuit Integrity (CI) Cable.

Cable used in communications systems to ensure continued operation of critical circuits during a specified time under fire conditions.

Electrical Circuit Protective. A system consisting of components & materials intended for installation as protection for specific electrical wiring systems with respect to the disruption of electrical circuit integrity upon exterior fire exposure.

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Chapter 8 – Communications Circuits

Exposed (to Accidental Contact) A circuit that is in such a position that, in case of failure of supports or insulation, contact with another circuit may result.

Point of Entrance The point within a building at which the communications wire or cable emerges from an external wall, from a concrete floor slab, or from a rigid metal conduit (Type RMC) or an intermediate metal conduit (Type IMC).

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Chapter 8 – Communications Circuits

Premises. The land and buildings of a user located on the user side of the utility-user network point of demarcation.

Wire. A factory assembly of one or more insulated conductors without an overall covering.

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Chapter 8 – Communications Circuits

800.21 Access to Electrical Equipment Behind Panels Designed to Allow Access.

Access to electrical equipment shall not be denied by an accumulation of communications wires and cables that prevents removal of panels, including suspended ceiling panels.

800.25 Abandoned Cables. The accessible portion of abandoned communications cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

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Chapter 8 – Communications Circuits

800.26 Spread of Fire or Products of Combustion

Installations of communications cables and communications raceways in hollow spaces, vertical shafts, and ventilation or air-handling ducts shall be made so that the possible spread of fire or products of combustion will not be substantially increased. Openings around penetrations of communications cables and communications raceways through fire-resistant-rated walls, partitions, floors, or ceilings shall be firestopped using approved methods to maintain the fire resistance rating.

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Chapter 8 – Communications Circuits

800.44 Overhead (Aerial) Communications Wires and Cables Overhead (aerial) communications wires and cables entering buildings shall comply with 800.44(A) and (B).

(A) On Poles and In-Span Where communications wires and cables and electric light or power conductors are supported by the same pole or are run parallel to each other in-span, the conditions described in 800.44(A)(1) through (A)(4) shall be met.

(1) Relative Location Where practicable, the communications wires and cables shall be located below the electric light or power conductors.

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Chapter 8 – Communications Circuits

(2) Attachment to Cross-Arms.

Communications wires and cables shall not be attached to a cross-arm that carries electric light or power conductors.

(3) Climbing Space.

The climbing space through communications wires and cables shall comply with the requirements of 225.14(D).

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Chapter 8 – Communications Circuits

(4) Clearance.

Supply service drops & sets of overhead service conductors of 0–750 volts running above and parallel to communications service drops shall have a minimum separation of 300 mm (12 in.) at any point in the span, including the point of and at their attachment to the building, provided the ungrounded conductors are insulated and that a clearance of not less than 1.0 m (40 in.) is maintained between the two services at the pole.

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Chapter 8 – Communications Circuits

(B) Above Roofs.

Communications wires and cables shall have a vertical clearance of not less than 2.5 m (8 ft) from all points of roofs above which they pass.

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Chapter 8 – Communications Circuits

800.47 Underground Communications Wires and Cables Entering Buildings.

Underground communications wires and cables entering buildings shall comply with 800.47(A) and (B). The requirements of 310.10(C) shall not apply to communications wires and cables.

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Chapter 8 – Communications Circuits

800.47 Underground Communications Wires and Cables Entering Buildings - Cont.

(A) With Electric Light or Power Conductors

Underground communications wires and cables in a raceway, handhole enclosure, or manhole containing electric light, power, Class 1, or non–power-limited fire alarm circuit conductors shall be in a section separated from such conductors by means of brick, concrete, or tile partitions or by means of a suitable barrier.

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Chapter 8 – Communications Circuits

800.47 Underground Communications Wires and Cables Entering Buildings - Cont.

(B) Underground Block Distribution Where the entire street circuit is run underground and the circuit within the block is placed so as to be free from the likelihood of accidental contact with electric light or power circuits of over 300 volts to ground, the insulation requirements of 800.50(A) and (C) shall not apply, insulating supports shall not be required for the conductors, and bushings shall not be required where the conductors enter the building.

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Chapter 8 – Communications Circuits

800.90 Protective Devices.

(A) Application. A listed primary protector shall be provided on each circuit run partly or entirely in aerial wire or aerial cable not confined within a block. Also, a listed primary protector shall be provided on each circuit, aerial or underground, located within the block containing the building served so as to be exposed to accidental contact with electric power conductors operating at over 300 volts to ground.

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Chapter 8 – Communications Circuits

800.90 Protective Devices. - Cont.

In addition, where there exists a lightning exposure, each interbuilding circuit on a premises shall be protected by a listed primary protector at each end of the interbuilding circuit. Installation of primary protectors shall also comply with 110.3(B).

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Chapter 8 – Communications Circuits

Informational Note No. 1: On a circuit not exposed to accidental contact with power conductors, providing a listed primary protector in accordance with this article helps protect against other hazards, such as lightning and above-normal voltages induced by fault currents on power circuits in proximity to the communications circuit.

Informational Note No. 2: Interbuilding circuits are considered to have a lightning exposure unless one or more of the following conditions are exists:

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Chapter 8 – Communications Circuits

- (1) Circuits in large metropolitan areas where buildings are close together and sufficiently high to intercept lightning.
- (2) Interbuilding cable runs of 42 m (140 ft.) or less, directly buried or in underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is connected to each building grounding electrode system.
- (3) Areas having an average of five or fewer thunderstorm days per year and earth resistivity of less than 100 ohmmeters. (found along the Pacific coast)

BFAAM Apprenticeship Program

End of Period # 4