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M E M O R A N D U M

TO: Code-Making Panel 13

FROM: Sarah Caldwell, *Committee Administrator*

DATE: April 15, 2021

SUBJECT: NEC® First Draft Technical Committee FINAL Ballot Results (A22)

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot.

22 Members Eligible to Vote

3 Members Not Returned (*Jordan, Paulsen, White*)

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for each revision.

To pass ballot, each revision requires: (1) a simple majority of those eligible to vote and (2) an affirmative vote of $\frac{2}{3}$ of ballots returned. See Sections 3.3.4.3.(c) and 4.3.10.1 of the *Regulations Governing the Development of NFPA Standards*.



First Revision No. 8978-NFPA 70-2021 [Global Input]

[Definition being added to Article 100.]

Generator (Generator Set).

A machine that converts mechanical energy into electrical energy by means of a prime mover and alternator and/or inverter. (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 12:55:07 EST 2021

Committee Statement

Committee Statement: A definition of generator (generator set) has been added in article 100 to define and clarify the components of a generator.

Response Message: FR-8978-NFPA 70-2021

[Public Input No. 1432-NFPA 70-2020 \[Section No. 445.1\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9142-NFPA 70-2021 [Global Input]****[NEC-P13 created this FR based on actions required in PI-3330]****702.12(C) Power Inlets Rated at 100 Amperes or Greater, for Portable Generators.**

Equipment containing power inlets for the connection of a generator source shall be listed for the intended use. Systems with power inlets not rated as a disconnecting means shall be equipped with an interlocked disconnecting means.

~~Exception No. 1: If the inlet device is rated as a disconnecting means~~

~~Exception No. 2: Supervised industrial installations where permanent space is identified for the portable generator located within line of sight of the power inlets shall not be required to have interlocked disconnecting means nor inlets rated as disconnects.~~

708.10(B) Wiring.

Wiring of two or more COPS circuits supplied from the same source shall be permitted in the same raceway, cable, box, or cabinet. In other than transfer equipment enclosures, ~~W~~wiring from a COPS source or COPS source distribution overcurrent protection to critical loads shall be kept entirely independent of all other wiring and equipment.

~~Exception: Where the COPS feeder is installed in transfer equipment enclosures.~~

708.20(C) Grounding.

All sources of power shall be grounded as a separately derived source in accordance with 250.30.

Exception: Where installed in accordance with 708.10(C) and 708.11(B), ~~the~~ equipment containing the main bonding jumper or system bonding jumper for the normal source and the feeder wiring to the transfer equipment shall not be required to be grounded as a separately derived source. ~~are installed in accordance with 708.10(C) and 708.11(B).~~

Submitter Information Verification

Committee: NEC-P13

Submission Date: Fri Jan 15 14:36:41 EST 2021

Committee Statement

Committee Statement: CMP-13 reviewed the Articles under its purview and made appropriate changes per the global Public Input # 3330.

Response Message: FR-9142-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9192-NFPA 70-2021 [Global Input]**

[See attached word document to move all existing definitions to Article 100 under the purview of NEC-P13. See statement for additional instructions.]

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70-CMP13_FR9192_Global-Definitions.docx	NEC_P13_FR_9192_Global-Definitions. For staff use	
NEC_CMP_13_FR_9192_Definitions_for_ballot.docx	For ballot	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Sun Jan 17 11:08:21 EST 2021

Committee Statement

Committee Statement: This FR moves all existing definitions under the purview of CMP-13 to Article 100 and revises these definitions for compliance with Section 2.2.2 of the NEC Style Manual. Additionally, all definition sections (455.2, 480.2, 695.2, 700.2, 701.2, 702.2, 706.2, 708.2, 712.2, and 750.2,) in the articles under the responsibility of CMP-13 are deleted.

Response Message: FR-9192-NFPA 70-2021

[Public Input No. 3954-NFPA 70-2020 \[Section No. 702.2\]](#)

[Public Input No. 3635-NFPA 70-2020 \[Section No. 455.2\]](#)

[Public Input No. 3965-NFPA 70-2020 \[Section No. 750.2\]](#)

[Public Input No. 3957-NFPA 70-2020 \[Section No. 706.2\]](#)

[Public Input No. 3945-NFPA 70-2020 \[Section No. 695.2\]](#)

[Public Input No. 3950-NFPA 70-2020 \[Section No. 700.2\]](#)

[Public Input No. 3961-NFPA 70-2020 \[Section No. 712.2\]](#)

[Public Input No. 451-NFPA 70-2020 \[Section No. 750.2\]](#)

[Public Input No. 3638-NFPA 70-2020 \[Section No. 480.2\]](#)

[Public Input No. 3958-NFPA 70-2020 \[Section No. 708.2\]](#)

[Public Input No. 3952-NFPA 70-2020 \[Section No. 701.2\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

17 Affirmative All

1 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

This reorganization will improve usability of the code.

Negative with Comment

Little, Linda J.

Relocating all definitions to Article 100 is not user-friendly and will result in misapplication of NEC requirements. Requests to move definitions have been made over multiple cycles and CMP members have agreed to these moves when appropriate and rejected these changes when they increased likelihood of miss-application of NEC requirements. Forcing these changes via the Style Manual demonstrates a lack of confidence in CMP actions. An alternative to adding the Article number at the the end of each definition is to build an Annex to identify all definitions that apply only within a given Article. The NEC Correlating Committee should appoint a task group to build an Annex for these article-specific definitions. This negative ballot and the reference to new Annex material provides the public with an opportunity to comment on a new Annex for these relocated definitions. A comment to include a new Annex for Article-specific definitions will not be new material and can be acted upon in the comment stage for inclusion in the 2023 NEC.

~~455.2 Definitions.~~

~~Manufactured-Phase, Manufactured (Manufactured Phase).~~

~~This definition shall apply within this article and throughout the Code.~~

The phase that originates at the phase converter and is not solidly connected to either of the single-phase input conductors. (CMP-13)

Phase Converter.

~~This definition shall apply within this article and throughout the Code.~~

An electrical device that converts single-phase power to 3-phase electric power. (CMP-13)

Informational Note: Phase converters have characteristics that modify the starting torque and locked-rotor current of motors served, and consideration is required in selecting a phase converter for a specific load.

~~Rotary-Phase Converter, Rotary (Rotary-Phase Converter).~~

~~This definition shall apply only within this article.~~

A device that consists of a rotary transformer and capacitor panel(s) that permits the operation of 3-phase loads from a single-phase supply. (455) (CMP-13)

~~Static-Phase Converter, Static (Static-Phase Converter).~~

~~This definition shall apply only within this article.~~

A device without rotating parts, sized for a given 3-phase load to permit operation from a single-phase supply. (455) (CMP-13)

~~480.2 Definitions.~~

~~The definitions in this section shall apply only within this article.~~

Cell (as applied to batteries).

The basic electrochemical unit, characterized by an anode and a cathode, used to receive, store, and deliver electrical energy. (CMP-13)

Container (as applied to batteries).

A vessel that holds the plates, electrolyte, and other elements of a single unit in a battery. (CMP-13)

Informational Note: A container may be single-cell or multi-cell and is sometimes referred to in the industry as a “jar.”

Electrolyte.

The medium that provides the ion transport mechanism between the positive and negative electrodes of a cell. (CMP-13)

~~Intereell~~ **Connector, Intercell (Intercell Connector).**

An electrically conductive bar or cable used to connect adjacent cells. (CMP-13)

~~Intertier~~ **Connector, Intertier (Intertier Connector).**

An electrical conductor used to connect two cells on different tiers of the same rack or different shelves of the same rack. (CMP-13)

Nominal Voltage (as applied to Battery-battery or Cellcell).

The value assigned to a cell or battery of a given voltage class for the purpose of convenient designation. The operating voltage of the cell or battery may vary above or below this value. (CMP-13)

Informational Note: The most common nominal cell voltages are 2 volts per cell for the lead-acid systems, 1.2 volts per cell for alkali systems, and 3.6 to 3.8 volts per cell for Li-ion systems. Nominal voltages might vary with different chemistries.

Sealed Cell or Battery.

A cell or battery that has no provision for the routine addition of water or electrolyte or for external measurement of electrolyte specific gravity and might contain pressure relief venting. (CMP-13)

Storage Battery (Battery).

A single or group of rechargeable cells connected together electrically in series, in parallel, or a combination of both, and comprised of lead-acid, nickel-cadmium, or other rechargeable electrochemical types. (CMP-13)

Terminal (as applied to batteries).

That part of a cell, container, or battery to which an external connection is made (commonly identified as post, pillar, pole, or terminal post). (CMP-13)

~~**695.2 Definitions.**~~

~~The definitions in this section shall only apply within this article.~~

~~**Fault-Tolerant External Control Circuits, Fault-Tolerant External (Fault-Tolerant External Control Circuits).**~~

Those control circuits either entering or leaving the fire pump controller enclosure, which if broken, disconnected, or shorted will not prevent the controller from starting the fire pump from all other internal or external means and may cause the controller to start the pump under these conditions. (695) (CMP-13)

~~**On-Site Power Production Facility, On-Site Power Production (On-Site Power Production Facility).**~~

The normal supply of electric power for the site that is expected to be constantly producing power. (695) (CMP-13)

~~**On-Site Standby Generator, On-Site Standby (On-Site Standby Generator).**~~

A facility producing electric power on site as the alternate supply of electric power. It differs from an on-site power production facility in that it is not constantly producing power. (695) (CMP-13)

~~**700.2 Definitions.**~~

~~**Branch-Circuit Emergency Lighting Transfer Switch, Branch-Circuit Emergency Lighting (Branch-Circuit Emergency Lighting Transfer Switch).**~~

~~This definition shall apply only within this article.~~

A device connected on the load side of a branch-circuit overcurrent protective device that transfers only emergency lighting loads from the normal supply to an emergency supply. (700) (CMP-13)

Informational Note: See ANSI/UL 1008, Transfer Switch Equipment, for information covering branch-circuit emergency lighting transfer switches.

~~**Emergency Luminaire, Emergency, Directly Controlled (Directly Controlled Emergency Luminaire).**~~

An emergency luminaire that has a control input for an integral dimming or switching function that drives the luminaire to the required illumination level upon loss of normal power. (700) (CMP-13)

Informational Note: See ANSI/UL 924, Emergency Lighting and Power Equipment, for information covering directly controlled luminaires.

Emergency Systems.

~~This definition shall apply within this article and throughout the Code.~~

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. (CMP-13)

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 communications systems, industrial processes where current interruption would produce serious life safety or health hazards, and similar functions.

Relay, Automatic Load Control (Automatic Load Control Relay).

A device used to set normally dimmed or normally-off switched emergency lighting equipment to full power illumination levels in the event of a loss of the normal supply by bypassing the dimming/switching controls, and to return the emergency lighting equipment to normal status when the device senses the normal supply has been restored. (700) (CMP-13)

Informational Note: See ANSI/UL 924, Emergency Lighting and Power Equipment, for the requirements covering automatic load control relays.

~~**701.2 Definition.**~~

~~The definition in this section shall apply within this article and throughout the Code.~~

Legally Required Standby Systems.

Those systems required and so classed as legally required standby by municipal, state, federal, or other codes or by any 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. (CMP-13)

Informational Note: Legally required standby systems are typically installed to serve loads, such as heating and refrigeration systems,

communications 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.

~~702.2 Definition.~~

~~The definition in this section shall apply within this article and throughout the Code.~~

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. These systems are intended to supply on-site generated or stored power to selected loads either automatically or manually. (CMP-13)

Informational Note: Optional standby systems are typically installed to provide an alternate source of electric power for such facilities as industrial and commercial buildings, farms, and residences and to serve loads such as heating and refrigeration systems, data processing and communications systems, and industrial processes that, when stopped during any power outage, could cause discomfort, serious interruption of the process, damage to the product or process, or the like.

~~706.2 Definitions.~~

~~The definitions in this section shall apply only within this article.~~

Diversion Charge Controller.

Equipment that regulates the charging process of an ESS by diverting power from energy storage to direct-current or alternating-current loads or to an interconnected utility service. (706) (CMP-13)

Energy Storage System (ESS).

One or more components assembled together capable of storing energy and providing electrical energy into the premises wiring system or an electric power production and distribution network. (CMP-13)

Informational Note No. 1: ESS(s) can include but is not limited to batteries, capacitors, and kinetic energy devices (e.g., flywheels and compressed air). Energy storage systems can include inverters or converters to change voltage levels or to make a change between an ac or a dc system.

Informational Note No. 2: These systems differ from other storage systems such as a UPS system, which is a power supply used to provide alternating current power to a load for some period of time in the event of a power failure.

~~Flow-Battery, Flow (Flow Battery).~~

An energy storage component similar to a fuel cell that stores its active materials in the form of two electrolytes external to the reactor interface. When in use, the electrolytes are transferred between reactor and storage tanks. (706) (CMP-13)

Informational Note: Two commercially available flow battery technologies are zinc bromine and vanadium redox, sometimes referred to as pumped electrolyte ESS.

Inverter Utilization Output Circuit.

Conductors between the multimode or stand-alone inverter and utilization equipment. (706) (CMP-13)

~~708.2 Definitions.~~

~~The definitions in this section shall apply within this article and throughout the Code.~~

Commissioning.

The acceptance testing, integrated system testing, operational tune-up, and start-up testing is the process by which baseline test results verify the proper operation and sequence of operation of electrical equipment, in addition to developing baseline criteria by which future trend analysis can identify equipment deterioration. (CMP-13)

Critical Operations Power Systems (COPS).

Power systems for facilities or parts of facilities that require continuous operation for the reasons of public safety, emergency management, national security, or business continuity. (CMP-13)

~~Designated~~ Critical Operations Areas, Designated [Designated Critical Operations Areas (DCOA)].

Areas within a facility or site designated as requiring critical operations power. (CMP-13)

Supervisory Control and Data Acquisition (SCADA).

An electronic system that provides monitoring and controls for the operation of the critical operations power system. This can include the fire alarm

system, security system, control of the HVAC, the start/stop/monitoring of the power supplies and electrical distribution system, annunciation and communications equipment to emergency personnel, facility occupants, and remote operators. (CMP-13)

~~712.2 Definitions.~~

~~The definitions in this section shall apply only within this article.~~

~~Direct Current Microgrid, Direct Current [Direct Current Microgrid (DC Microgrid)]~~

A direct current microgrid is a power distribution system consisting of more than one interconnected dc power source, supplying dc-dc converter(s), dc load(s), and/or ac load(s) powered by dc-ac inverter(s). A dc microgrid is typically not directly connected to an ac primary source of electricity, but some dc microgrids interconnect via one or more dc-ac bidirectional converters or dc-ac inverters. (712) (CMP-13)

Informational Note: Direct current power sources include ac-dc converters (rectifiers), bidirectional dc-ac inverters/converters, photovoltaic systems, wind generators, energy storage systems (including batteries), and fuel cells.

~~Grounded, Functionally (Functionally Grounded).~~

A system that has an electrical ground reference for operational purposes that is not solidly grounded. (712) (CMP-13)

Informational Note: Examples of operational reasons for functionally grounded systems include ground-fault detection and performance-related issues for some power sources.

~~Grounded Three-Wire DC System, Three-Wire, Grounded (Grounded Three-Wire DC System).~~

A system with a solid connection or reference-ground between the center point of a bipolar dc power source and the equipment grounding system. (712) (CMP-13)

~~Grounded Two-Wire DC System, Two-Wire, Grounded (Grounded Two-Wire DC System).~~

A system that has a solid connection or reference-ground between one of the current-carrying conductors and the equipment grounding system. (712) (CMP-13)

~~Nominal Voltage, Nominal (Nominal Voltage).~~

A value assigned to a circuit or system for the purpose of conveniently designating its dc voltage class. (712) (CMP-13)

Informational Note: The actual voltage at which a circuit operates can vary from the nominal voltage within a range that permits satisfactory operation of equipment.

Primary DC Source.

A source that supplies the majority of the dc load in a dc microgrid. (712) (CMP-13)

~~Reference-Grounded DC System, Reference-Grounded (Reference-Grounded DC System).~~

A system that is not solidly grounded but has a low-resistance electrical reference that maintains voltage to ground in normal operation. (712) (CMP-13)

~~Ungrounded DC System, Ungrounded (Ungrounded DC System).~~

A system that has no direct or resistive connection between the current-carrying conductors and the equipment grounding system. (712) (CMP-13)

~~750.2 Definitions.~~

Control.

~~This definition shall apply only within this article.~~

The predetermined process of connecting, disconnecting, increasing, or reducing electric power. (750) (CMP-13)

Energy Management System.

~~This definition shall apply within this article and throughout the Code.~~

A system consisting of any of the following: a monitor(s), communications equipment, a controller(s), a timer(s), or other device(s) that monitors and/or controls an electrical load or a power production or storage source. (CMP-13)

Monitor.

~~This definition shall apply only within this article.~~

An electrical or electronic means to observe, record, or detect the operation or condition of the electric power system or apparatus. (750) (CMP-13)



First Revision No. 8781-NFPA 70-2021 [Detail]

[New definition being added to Article 100.]

Normal/Emergency Power Source.

A power source on the output side of a transfer switch or uninterruptable power supply that is automatically available upon loss of normal power. (700)(CMP-13).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 12:35:14 EST 2021

Committee Statement

Committee Statement: 700.23 already uses this term(Normal/Emergency Power Source). As emergency control systems increase in complexity to adapt to new technologies, this term needs a clear definition.When applied to other requirements for sensing loss of normal power, it is important to have a clear nomenclature and definition of a circuit on the load side of a transfer switch that can be both a normal and an emergency circuit.

Response Message: FR-8781-NFPA 70-2021

Public Input No. 669-NFPA 70-2020 [New Definition after Definition: Emergency Systems.]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 8782-NFPA 70-2021 [Detail]

[New definition to be added to Article 100.]

Emergency Luminaire, Battery- Equipped (Battery- Equipped Emergency Luminaire).

A luminaire with a rechargeable battery, a battery charging means, and an automatic load control relay. (700)(701)(CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 12:42:59 EST 2021

Committee Statement

Committee Statement: The definitions "Emergency Luminaire, Battery-Equipped" and "Unit Equipment" were added to correlate with changes in 700.12 and 700.12(l).

See the first revision in 700.12.

Response Message: FR-8782-NFPA 70-2021

[Public Input No. 2203-NFPA 70-2020 \[New Definition after Definition: Emergency Luminaire, Direc...\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8792-NFPA 70-2021 [Detail]

[Add new section after 700.4(C).]

(D) Parallel Operation.

Parallel operation of the emergency source(s) shall consist of the sources specified in 700.4(D)(1) and (D)(2).

(1) Normal Source.

The emergency source shall be permitted to operate in parallel with the normal source in compliance with Part I or Part II of Article 705 where the capacity required to supply the emergency load is maintained at all times. Any operating condition that results in less than the required emergency source capacity shall initiate a system malfunction signal in accordance with 700.6(A).

Parallel operation shall be permitted for satisfying the test requirements of 700.3(B), provided all other conditions of 700.3 are met.

Informational Note: Peak load shaving is one application for parallel source operation.

(2) Emergency Source.

Emergency sources shall be permitted to operate in parallel where the necessary equipment to establish and maintain a synchronous condition is provided.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 13:28:30 EST 2021

Committee Statement

Committee Statement: This new first level subdivision clarifies that there are two distinctly different types of parallel operation. 700.4(D)(1) identifies requirements specific to applications where emergency source(s) operate in parallel with a normal source whereas 700.4(D)(2) identifies requirements for conditions where emergency sources operate in parallel only with each other. Some systems may utilize both conditions, so the charging sentence allows both to be applied.

For applications where an emergency source is used in parallel with a normal source, a statement that the required capacity to supply the emergency load be maintained at all times is included. To clarify these applications further with regard to other sections in Article 700, a reference to 700.6(A) is included to ensure that any reduction in the minimum capacity triggers a malfunction signal. Since systems that operate in parallel with a normal source are generally always functioning, a recognition that this operation meets the requirements for periodic testing is also included. All other requirements in 700.3 continue to apply so that is made clear in this new text. The sentences struck from previous 700.4(C) have been moved here (modified) into 700.4(D)(1).

A reference to article 705 has been added to point users to this article where requirements for interconnected sources are located. The addition of 700.4(D)(2) clarifies that emergency sources can be paralleled together provided they are suitable for this application. This was not

prohibited before, but it is important to state this here to distinguish between sources operated in parallel with each other and those that operate in parallel with a normal source.

Response FR-8792-NFPA 70-2021
Message:

Public Input No. 2794-NFPA 70-2020 [New Section after 700.4(C)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters
3 Not Returned
19 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 8818-NFPA 70-2021 [Detail]**

[Add new Section after 700.10.]

700.11 Wiring, Class-2-Powered Emergency Lighting Systems.**(A) General.**

Line voltage supply wiring and installation of Class 2 emergency lighting control devices shall comply with 700.10. Class 2 emergency circuits shall comply with 700.11(B) through (D).

(B) Identification.

Emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system by the following methods:

- (1) All boxes and enclosures for Class 2 emergency circuits shall be permanently marked as a component of an emergency circuit or system.
- (2) Where boxes or enclosures are not encountered, exposed cable, cable tray, or raceways systems shall be permanently marked to be identified as a component of an emergency circuit or system, within 3 m (1 ft) of each connector and at intervals not to exceed 7.6 m (25 ft).

(C) Separation of Circuits.

Class 2 emergency circuits shall be wired in a listed, jacketed cable or with one of the wiring methods of Chapter 3. Class 2 emergency circuits shall be separated from nonemergency Class 2 circuits. Separation from other circuits shall comply with 725.136.

(D) Protection.

Wiring shall comply with the requirements of 300.4 and be installed in a raceway, armored or metal-clad cable, or cable tray.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 17:07:43 EST 2021

Committee Statement

Committee Statement: Driven by the availability of new technologies such as Power over Ethernet and low-power consumption LED luminaires, a new type of emergency lighting system has emerged in the last three years. These systems utilize Class 2 conductors to deliver power, control signals or both, from a central device to one or more emergency luminaires. These luminaires are directly controlled emergency luminaires covered by 700.24.

The current requirements of article 700 regarding wiring of emergency circuits are directed to line voltage circuits. When the emergency system utilizes Class 2 circuits, additional alternative requirements are needed to ensure the system is installed with equivalent performance and safety to those systems using line-voltage conductors. For clarity this adds a new section covering Class 2 emergency lighting circuits. (A) is added to address line voltage supply wiring

for Class 2 emergency lighting control devices. (B) Identification: since these systems use Class 2 conductors, acceptable methods of identification for emergency circuits must be specified in order to be consistently applied to Class 2 wiring methods (C) Separation of Circuits: The separation of line-voltage emergency circuits required by 700.10(B) exists to prevent damage or destruction of these circuits from faults in adjacent non-emergency circuits. Class 2 emergency lighting circuits are not permitted to be mixed with other wiring. Protection shall be provided in accordance with 300.4.

Response FR-8818-NFPA 70-2021

Message:

[Public Input No. 2850-NFPA 70-2020 \[New Section after 700.10\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

17 Affirmative All

0 Affirmative with Comments

2 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Negative with Comment

Grover, Matthew B

If separation is to be required, the exceptions listed in 700.10 (B) should also apply to class 2 wiring. As written, this requirement does not allow for class 2 emergency wiring to be installed with other class 2 circuits under any circumstance. The protection requirement is also excessive in this case. Line voltage emergency wiring can be installed using the same methods as non-emergency circuits. Class 2 wiring should be treated similarly. Class 2 wiring is typically installed concealed and is not subject to physical damage under normal circumstances.

Little, Linda J.

The requirement for separation of Class 2 circuits from Class 2 Emergency circuits is unnecessary. Due to the power-limited nature of Class 2 circuits, there is a very low likelihood of damage to Class 2 Emergency circuits. The only valid separation requirement is that of 725.136, which is stated in 700.11(C). As it stands, 700.11(C) and 700.11(D) contradict each other. 700.11(D) requires installation of Class 2 Emergency circuits in a raceway, armored, or metal-clad cable, or cable tray. 700.11(C) allows installation of Class 2 emergency circuits either in a listed jacketed cable or in one of the Chapter 3 wiring methods. This contradiction is confusing and needs to be resolved. By removing "Where subject to physical damage..." from the beginning of 700.11(D) (See PI2850) it now appears that all Class 2 Emergency circuits would be required to be installed in a Chapter 3 wiring method from end-to end. This is not necessary from a safety point-of-view and is incompatible with the typical structured cord-and-plug wiring methods of many Class 2 systems, including Power over Ethernet (PoE). The unintended but practical result would be to prohibit Emergency circuits from PoE and similar systems. The words "Where subject to physical damage..." should be added back to 700.11(D). This will also resolve the contradiction between 700.11(C) and 700.11(D).



First Revision No. 8844-NFPA 70-2021 [Detail]

Section No. 700.12(D)(1)

(1) Prime Mover-Driven.

For a generator set driven by a prime mover approved by the authority having jurisdiction and sized in accordance with 700.4, means shall be provided for automatically starting the prime mover on failure of the normal service power source and for automatic transfer and operation of all required electrical circuits. A time-delay feature shall be provided to avoid retransfer in case of short-time reestablishment of the normal source.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 11:22:10 EST 2021

Committee Statement

Committee Statement: Normal service implies that the normal or primary power source can only be a utility per the NEC definition of “service.” This section was revised to say “power source” to allow other types of sources for the normal power. This revision also harmonizes with NFPA 110.

Response Message: FR-8844-NFPA 70-2021

[Public Input No. 4173-NFPA 70-2020 \[Section No. 700.12\(D\)\(1\)\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 8868-NFPA 70-2021 [Detail]

[Section 701.3(E) Informational Note]

(E) Testing Under Load.

Means for testing legally required standby systems under load shall be provided.

Informational Note: See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for information on testing and maintenance of emergency power supply systems (EPSSs).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 13:10:31 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual and to correlate with 700.1.

Response Message: FR-8868-NFPA 70-2021

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8965-NFPA 70-2021 [Detail]

[701.12(D) Generator Set.

(1) Prime Mover-Driven.

For a generator set driven by a prime mover approved by the authority having jurisdiction and sized in accordance with 701.4, means shall be provided for automatically starting the prime mover upon failure of the normal service power source and for automatic transfer and operation of all required electrical circuits. A time-delay feature permitting a 15-minute setting shall be provided to avoid retransfer in case of short-time re-establishment of the normal source.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 11:20:33 EST 2021

Committee Statement

Committee Statement: Normal service implies that the normal or primary power source can only be a utility per the NEC definition of "service." This section was revised to say "power source" to allow other types of sources for the normal power.

Response Message: FR-8965-NFPA 70-2021

[Public Input No. 4174-NFPA 70-2020 \[Section No. 701.12\(D\)\(1\)\]](#)

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9029-NFPA 70-2021 [Detail]

[Change of title for Article 480]

Article 480 ~~Storage~~ Stationary Standby Batteries

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 11:03:57 EST 2021

Committee Statement

Committee Statement: The title of the article is changed from “Storage Batteries” to “Stationary Standby Batteries.” This change in title provides a more accurate identification of what is covered by Article 480. In conjunction with the change in the title of the article a definition for Stationary Standby Battery is added and references throughout the article to “battery system(s)” and “stationary battery system” are change to “stationary standby battery(ies).” These changes narrow the scope of the article to batteries. The article is not intended to cover a battery as an energy storage system.

Response Message: FR-9029-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9051-NFPA 70-2021 [Detail]

[This is a new definition to be added to Article 100 created by CMP-13.]

Battery, Stationary Standby (Stationary Standby Battery)

A battery that spends the majority of the time on continuous float charge or in a high state of charge, in readiness for a discharge event. (CMP-13)

Informational Note: Uninterruptible Power Supply (UPS) batteries are an example that falls under this definition.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 11:55:44 EST 2021

Committee Statement

Committee Statement: A definition for a new term “Stationary Standby Battery” has been added.

This additional definition for ‘stationary standby battery’ is consistent with the change in scope of this article and is consistent with revisions made to the article to limit it to systems with dc loads.

The informational note was added to clarify that UPS batteries fit the definition of a stationary standby battery.

Response Message: FR-9051-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9077-NFPA 70-2021 [Detail]

[New definition to be added to Article 100 that NEC-P13 created.]

Flywheel ESS (FESS).

A mechanical ESS composed of a spinning mass referred to as a rotor and an energy conversion mechanism such as a motor-generator that converts the mechanical energy to electrical energy.
(706)(CMP-13)

Informational Note: There are primarily two types of rotor constructions, solid metal mass design and composite fiber design.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 14:38:17 EST 2021

Committee Statement

Committee Statement: A new definition for Flywheel ESS has been added for the new term used in new 706.51. Defining a Flywheel ESS provides an understanding of the concept of such a system.

Response Message: FR-9077-NFPA 70-2021

[Public Input No. 3112-NFPA 70-2020 \[Section No. 706.2\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9196-NFPA 70-2021 [Detail]

[Add new section after 706.50.]

706.51 Flywheel ESS (FESS).

Flywheel ESS (FESS) using flywheels as the storage mechanism shall also comply with all of the following:

(706.511.) FESS shall not be used for one- or two-family dwelling units.

Informational Note No. 1: FESS are intended for high-power shorter term applications. They contain parts that rotate under high speed with hazardous kinetic energy and include parts such as magnetic bearings that require ongoing monitoring and maintenance and, therefore, are not suitable for residential-type applications.

(706.512.) FESS shall be provided with bearing monitoring and controls that can identify bearing wear or damage to avoid catastrophic failure.

Informational Note No. 2: The bearing monitoring controls should be evaluated as part of the listing evaluation.

(706.513.) FESS shall be provided with a containment means to contain moving parts that could break from the system upon catastrophic failure.

Informational Note No. 3: The containment means should be evaluated as part of the listing evaluation.

(706.514.) The spin-down time of the FESS shall be provided in the maintenance documentation.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Sun Jan 17 12:11:52 EST 2021

Committee Statement

Committee Statement: Requirements are added to address flywheel ESS that are also included under Article 706 in "Other Energy Storage Technologies." It is important for these systems to have bearing monitoring and containment in the event there are projectiles that break off of the system.

Response Message: FR-9196-NFPA 70-2021

Public Input No. 3115-NFPA 70-2020 [New Section after 706.50]

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9605-NFPA 70-2021 [Detail]

[Add new definition to Article 100.]

Emergency Power Supply (EPS).

The source(s) of electric power of the required capacity and quality for an emergency power supply system (EPSS). (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 27 16:27:40 EST 2021

Committee Statement

Committee Statement: A new definition of Emergency Power Supply is also added to correlate with NFPA 110. See also FR-9610 and FR-9608.

Response Message: FR-9605-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9607-NFPA 70-2021 [Detail]

[Add new definition to Article 100.]

Control Device, Emergency Lighting.

A separate or integral device intended to perform one or more emergency lighting control functions.
(700)(CMP-13)

Informational Note: See UL 924, Emergency Lighting and Power Equipment , for information covering emergency lighting control devices.

Submitter Information Verification

Committee: NEC-P13

Submission Date: Wed Jan 27 17:22:44 EST 2021

Committee Statement

Committee Statement: 700.16(B) uses the term “control devices in the emergency lighting system.” There has been some confusion in the industry as to what qualifies as an emergency lighting control device as the term is used, but not defined in the Code. A definition of an emergency lighting control device and informational note pointer to UL924 is required for clarity. This definition will provide users with a consistent understanding of the types of devices that are considered emergency lighting control devices. ANSI has been removed from the UL reference.

Response Message: FR-9607-NFPA 70-2021

[Public Input No. 2849-NFPA 70-2020 \[New Definition after Definition: Branch-Circuit Emergency L...\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
3 Not Returned
19 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnolddo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9608-NFPA 70-2021 [Detail]

[Add new definition to Article 100.]

Emergency Power Supply System (EPSS).

This definition shall apply within this article and throughout the code. A complete functioning EPS system coupled to a system of conductors, disconnecting means and overcurrent protective devices, transfer switches, and all control, supervisory, and support devices up to and including the load terminals of the transfer equipment needed for the system to operate as a safe and reliable source of electric power. [110:3.3.4] (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 27 18:10:42 EST 2021

Committee Statement

Committee Statement: The definition of an Emergency Power Supply System (EPSS) is added in Article 700 for alignment with NFPA 110. This definition is useful to describe emergency systems consisting of multiple sources to collectively supply loads when the normal supply is interrupted. Also see FR-9605 and FR-9610.

This revision was developed by NFPA staff for editorial purposes, in accordance with 4.3.9.3.2 and 4.3.9.3.3 of the Regulations Governing the Development of NFPA Standards (www.nfpa.org/regs).

Response Message: FR-9608-NFPA 70-2021

[Public Input No. 2788-NFPA 70-2020 \[Section No. 700.2\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9616-NFPA 70-2021 [Detail]

[New Definition to be added to Article 100 by CMP-13.]

Spin Down.

A shutdown condition of the FESS, where energy is being dissipated and the flywheel rotor is slowing down to a stop. (706)(CMP-13)

Informational Note: A complete stop of a flywheel rotor cannot occur instantaneously because of the high kinetic energy of the rotor, but rather occurs over time as a result of friction forces acting on the rotor.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 28 23:19:51 EST 2021

Committee Statement

Committee Statement: A new definition for Spin Down has been added for the new term used in new 706.51. Defining Spin Down describes the performance of the FESS during a shutdown condition. Also see FR-9077.

Response Message: FR-9616-NFPA 70-2021

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9618-NFPA 70-2021 [Detail]

[Move the Informational Note from "Operational Standby Systems" to 702.1.]

702.1 Scope.

This article applies 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.

Informational Note: Optional standby systems are typically installed to provide an alternate source of electric power for such facilities as industrial and commercial buildings, farms, and residences and to serve loads such as heating and refrigeration systems, data processing and communications systems, and industrial processes that, when stopped during any power outage, could cause discomfort, serious interruption of the process, damage to the product or process, or the like.

702.2 Definition.

The definition in this section shall apply within this article and throughout the *Code*.

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. These systems are intended to supply on-site generated or stored power to selected loads either automatically or manually.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 29 10:46:29 EST 2021

Committee Statement

Committee Statement: The definition of "Optional Standby Systems" is being moved to Article 100. CMP-13 has moved the Informational Note from "Optional Standby System" in 702.2 to 702.1 so that the Informational Note is retained within Article 702.

Response Message: FR-9618-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnolddo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Jonas, Jeff

Change the word "operational" to "optional" in the heading and in the committee statement. 2 places.



First Revision No. 9619-NFPA 70-2021 [Detail]

[Add new definition to Article 100.]

Stored-Energy Power Supply System (SEPSS).

This definition shall apply within this article and throughout the code. A complete functioning EPSS powered by a stored-energy electrical source. (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 29 11:54:14 EST 2021

Committee Statement

Committee Statement: The term Stored-Energy Power Supply System (SEPSS) is being introduced to address the unique requirements for these sources to serve within an EPSS. Also see FR-9608 and FR-9605.

This revision was developed by NFPA staff for editorial purposes, in accordance with 4.3.9.3.2 and 4.3.9.3.3 of the Regulations Governing the Development of NFPA Standards (www.nfpa.org/regs).

Response Message: FR-9619-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9622-NFPA 70-2021 [Detail]

[New definition to be added to Article 100.]

Unit Equipment.

A battery-equipped emergency luminaire that illuminates only as part of the emergency illumination system and is not illuminated when the normal supply is available. (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Feb 01 15:32:07 EST 2021

Committee Statement

Committee Statement: The definitions “Emergency Luminaire, Battery-Equipped” and “Unit Equipment” were added to correlate with changes in 700.12 and 700.12(l).

See the first revision in 700.12.

Response Message: FR-9622-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9629-NFPA 70-2021 [Detail]**

Make changes to existing definition in 480.2 and add new definition for Article 100.

Sealed Cell or Battery, Sealed. (Sealed Battery)

A ~~cell or~~ battery that has no provision for the routine addition of water or electrolyte or for external measurement of electrolyte specific gravity and might contain pressure relief venting.

Cell, Sealed. (Sealed Cell)

A cell that has no provision for the routine addition of water or electrolyte or for external measurement of electrolyte specific gravity and might contain pressure relief venting. (CMP-13).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Feb 24 10:45:31 EST 2021

Committee Statement

Committee Statement: With the relocation of all definitions to Article 100, separate definitions for “cell, sealed (sealed cell)” and “battery, sealed (sealed batter)” are created in order for all definitions with the term “battery” to be grouped alphabetically.

Response Message: FR-9629-NFPA 70-2021

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.
Biaison, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9127-NFPA 70-2021 [Definition: Battery System.]

~~Battery System.~~

~~Interconnected battery subsystems consisting of one or more storage batteries and battery chargers, and can include inverters, converters, and associated electrical equipment. (CMP-13)~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 12:03:08 EST 2021

Committee Statement

Committee Statement: The definition of "battery system" was deleted to clarify the differences between a traditional stationary standby battery and energy storage or uninterruptible power supply systems which include electrochemical stored energy.

Response Message: FR-9127-NFPA 70-2021

[Public Input No. 2812-NFPA 70-2020 \[Definition: Battery System.\]](#)

[Public Input No. 4326-NFPA 70-2020 \[Definition: Battery System.\]](#)

[Public Input No. 1820-NFPA 70-2020 \[Definition: Battery System.\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9125-NFPA 70-2021 [Definition: Electric Power Production and Distribution Netw...]

Electric Power Production and Distribution Network.

Power production, distribution, and utilization equipment and facilities, such as electric utility systems that are connected to premises wiring and are external to and not controlled by an interactive a system that operates in interactive mode . (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 11:32:27 EST 2021

Committee Statement

Committee Statement: The term “interactive system” is replaced with “interactive mode” to better describe the functionality and various operational modes associated with systems that connect to an electric power production and distribution network.

Response Message: FR-9125-NFPA 70-2021

[Public Input No. 2978-NFPA 70-2020 \[Definition: Electric Power Production and Distribution Netw...\]](#)

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9126-NFPA 70-2021 [Definition: Interactive Inverter.]

Inverter, Interactive. (Interactive Inverter.)

An inverter intended for use in parallel with power source(s) such as an electric utility to supply common loads and capable of delivering power to the utility Inverter equipment having the capability to operate only in interactive mode . (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 11:35:49 EST 2021

Committee Statement

Committee Statement: The term “interactive inverter” is revised to address the functionality provided by this equipment and differentiate from inverters capable of operating in other modes.

Response Message: FR-9126-NFPA 70-2021

Public Input No. 2687-NFPA 70-2020 [Definition: Interactive Inverter.]

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9129-NFPA 70-2021 [Definition: Uninterruptible Power Supply.]

Uninterruptible Power Supply_(UPS) .

~~A power supply used to provide alternating current power to a load for some period of time in the event of a power failure device or system that provides quality and continuity of ac power through the use of a stored-energy device as the backup power source for a period of time when the normal power supply is incapable of performing acceptably . (CMP-13)~~

~~Informational Note: In addition, it may provide a more constant voltage and frequency supply to the load, reducing the effects of voltage and frequency variations.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 12:15:05 EST 2021

Committee Statement

Committee Statement: The definition of uninterruptible power supply was revised to clarify the system operation and duration limitations. An acronym was added to make use of the term more concise elsewhere in the code. The informational note was removed as the concepts are conveyed in the revised definition.

Response Message: FR-9129-NFPA 70-2021

Public Input No. 4171-NFPA 70-2020 [Definition: Uninterruptible Power Supply.]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9128-NFPA 70-2021 [New Definition after Definition: Switch, Transfer.]

Switch, Meter-Mounted Transfer. (Meter-Mounted Transfer Switch)

A transfer switch connected between the utility meter and the meter base or fabricated as part of the meter base. (CMP-13)

Informational Note: Meter-mounted transfer switches can plug into the meter base or be fabricated as part of the meter base. Transfer switches that incorporate the meter base in the transfer equipment assembly are not considered meter-mounted transfer switches.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 12:09:57 EST 2021

Committee Statement

Committee Statement: The definition of “meter-mounted transfer switch” is being added to clarify this type of equipment and the associated use within the wiring system. The term is used in multiple articles and providing a common definition is warranted. This definition correlates with the definition found in UL 1008M.

Response Message: FR-9128-NFPA 70-2021

Public Input No. 1961-NFPA 70-2020 [Definition: Switch, Transfer.]

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnolando L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

This informational note was difficult to get right. Thanks to the efforts of some very knowledgeable code panel members, the note is clear, and importantly distinguishes between two pieces of equipment with similar functions, but that may need different sets of requirements.

**First Revision No. 8975-NFPA 70-2021 [New Section after 445.1]****445.4 Reconditioned Generators.**

The reconditioning of generators shall be in accordance with instructions provided by a generator manufacturer. The generator nameplate shall not be required to be removed. Where a generator is reconditioned it shall be identified as reconditioned and marked in accordance with 110.21(A)(2) .

Reconditioned, rewind, or repaired classified (hazardous) generators identified for use in Class I, Division 1 (or Zone 0 or 1) locations shall be listed as reconditioned (or certified as reconditioned).

Informational Note No. 1: See ANSI/EASA AR100-2015, *Recommended Practice for the Repair of Rotating Electrical Apparatus* , for information pertaining to the rewinding and repair of generators.

Informational Note No. 2: See Title 40, Code of Federal Regulations, for emissions nameplate labeling of engine generators subject to Environmental Protection Agency regulations.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 12:42:16 EST 2021

Committee Statement

Committee Statement: It is a normal practice for generators to be reconditioned. Reconditioning of generators are accomplished in accordance with manufacturer's instructions and/or to the nationally recognized standard. For clarity a requirement to align with 110.21(A)(2) has been added. Classified generators used in Class I, Division 1 (Zone 0 and Zone 1) locations are permitted to be reconditioned when re-certified.

Information Note 1 is added to advise of the Recommended Practice for the Repair of Rotating Electrical Apparatus and conforms with the Style Manual 3.1.3.1 and 4.1.3.

Informational Note 2 is added to advise of the EPA operational consequences that may occur resulting from reconditioning.

Response Message: FR-8975-NFPA 70-2021

Public Input No. 2628-NFPA 70-2020 [New Section after 445.1]

Public Input No. 3215-NFPA 70-2020 [New Section after 445.1]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

This addition would make it clear that the NEC supports a common industry practice and deems it to have no negative impact on safety. Such reconditioning provides numerous benefits to property owners and installers by reducing down time on standby systems.



First Revision No. 8981-NFPA 70-2021 [Section No. 445.6]

445.6 Listing.

Stationary generators ~~600-volts and less~~ shall be listed.

Exception: One of a kind or custom manufactured generators shall be permitted to be field labeled by a field evaluation body.

Informational Note: ~~For additional information, see~~ See UL 2200, *Standard for Stationary Engine Generator Assemblies*, for additional information.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 13:06:37 EST 2021

Committee Statement

Committee Statement: This revision deletes voltage limitation to conform with the listing requirement in UL 2200, Edition 3 to recognize higher voltages. Deleting “by a field evaluation body” as it is unnecessary.

Information note has been revised to conform with the Style Manual 3.1.3.1 and 4.1.3

Response Message: FR-8981-NFPA 70-2021

[Public Input No. 4154-NFPA 70-2020 \[Section No. 445.6\]](#)

[Public Input No. 3869-NFPA 70-2020 \[Section No. 445.6\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 8983-NFPA 70-2021 [Section No. 445.10]

445.10 Location.

Generators shall be of a type suitable for the locations in which they are installed. They shall also meet the requirements for motors in 430.14.

Informational Note: See NFPA 37-2021 , *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*, for information on the location of generator exhaust generators .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 13:13:00 EST 2021

Committee Statement

Committee Statement: Revised verbiage is consistent with NFPA 37 which establishes criteria for locating generators.

Response Message: FR-8983-NFPA 70-2021

[Public Input No. 945-NFPA 70-2020 \[Section No. 445.10\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8991-NFPA 70-2021 [Section No. 445.11]

445.11 Marking.

Each generator shall be provided with a nameplate giving the manufacturer's name, the rated frequency, the number of phases if ac, the rating in kilowatts or kilovolt-amperes, the power factor, the normal volts and amperes corresponding to the rating, and the rated ambient temperature.

Nameplates or manufacturer's instructions shall provide the following information for all stationary generators and portable generators rated more than 15 kW:

- (1) ~~Subtransient~~ Alternator subtransient , transient, synchronous, and zero sequence reactances
- (2) ~~Power Generator set power~~ rating category (prime, standby, or continuous)
- (3) ~~Temperature~~ Alternator temperature rise at rated load and insulation system class
- (4) Indication if the generator is protected against overload by inherent design, an overcurrent protective relay, a circuit breaker, or a fuse
- (5) Available fault current for inverter-based generators, in lieu of the synchronous, subtransient, and transient reactances

Marking shall be provided by the manufacturer to indicate whether or not the generator neutral is bonded to its frame. Where the bonding is modified in the field, additional marking shall be required to indicate whether the neutral is bonded to the frame.

Equipment mounted to the generator assembly shall not conceal or obscure the generator nameplate.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 13:43:49 EST 2021

Committee Statement

Committee Statement: 2360) The revision clarifies that equipment cannot be mounted where it would conceal or obscure the nameplate.

(2555) The revision clarifies the equipment ratings and adds additional information that is important for compliant installations.

Response Message: FR-8991-NFPA 70-2021

[Public Input No. 2360-NFPA 70-2020 \[Section No. 445.11\]](#)

[Public Input No. 2555-NFPA 70-2020 \[Section No. 445.11\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9028-NFPA 70-2021 [Section No. 445.18]****445.18 Disconnecting Means and Emergency Shutdown .****(A) Disconnecting Means.**

Generators other than cord-and-plug-connected portable generators shall have one or more disconnecting means. Each disconnecting means shall simultaneously open all associated ungrounded conductors. Each disconnecting means shall be lockable open in accordance with 110.25.

The disconnecting means shall be permitted to be located within the generator behind a hinged cover, door, or enclosure panel. Where the generator disconnecting means is located within the generator, a field applied label meeting the requirements of 110.21(B) shall be provided indicating the location of the generator disconnecting means.

(B) Generators Installed in Parallel.

Where a generator is installed in parallel with other generators, the provisions of 445.18(A) shall be capable of isolating the generator output terminals from the paralleling system bus. The disconnecting means shall not be required to be located at the generator.

~~(B) Emergency Shutdown of Prime Mover.~~

~~Generators shall have provisions to shut down the prime mover. The means of shutdown shall comply with all of the following:~~

- ~~(0) Be equipped with provisions to disable all prime mover start control circuits to render the prime mover incapable of starting~~
- ~~(0) Initiate a shutdown mechanism that requires a mechanical reset~~

~~The provisions to shut down the prime mover shall be permitted to satisfy the requirements of 445.18(A) where it is capable of being locked in the open position in accordance with 110.25 .~~

~~(B) Remote Emergency Shutdown.~~

~~Generators with greater than 15 kW rating shall be provided with a remote emergency stop switch to shut down the prime mover. The remote emergency stop switch shall be located outside the equipment room or generator enclosure and shall also meet the requirements of 445.18(B)(1) and (B)(2).~~

~~(B) Emergency Shutdown in One- and Two-Family Dwelling Units.~~

~~For other than cord-and-plug-connected portable generators, an emergency shutdown device shall be located outside the dwelling unit at a readily accessible location.~~

~~(B) Generators Installed in Parallel.~~

~~Where a generator is installed in parallel with other generators, the provisions of 445.18(A) shall be capable of isolating the generator output terminals from the paralleling equipment. The disconnecting means shall not be required to be located at the generator.~~

445.19 Emergency Shutdown of Prime Mover.**(A) General.**

Generators shall have provisions to shut down the prime mover. The means of shutdown shall comply with all of the following:

- (1) Be equipped with provisions to disable all prime mover start control circuits to render the prime mover incapable of starting
- (2) Initiate a shutdown mechanism that requires a mechanical reset

The provisions to shut down the prime mover shall be permitted to satisfy the requirements of 445.18(A) where it is capable of being locked in the open position in accordance with 110.25.

(B) Remote Emergency Shutdown.

Generators For other than one- and two-family dwelling units, generators with greater than 15 kW rating shall be provided with a remote emergency stop switch to shut down the prime mover. The remote emergency stop switch shall be located outside the equipment room or generator enclosure at a readily accessible location and shall also meet the requirements of 445.18(B)(1) 445.19(A)(1) and (B A)(2).

The remote emergency stop switch shall be permitted to be mounted on the exterior of the generator enclosure. The remote emergency stop switch shall have a field applied label as Generator Emergency Shutdown, and the label shall meet the requirements of 110.21(B) .

(C) Emergency Shutdown in One- and Two-Family Dwelling Units.

For other than cord-and-plug-connected portable generators, an emergency shutdown device shall be located outside the dwelling unit at a readily accessible location and shall also meet the requirements of 445.19(A)(1) and (A)(2) .

An emergency shutdown device mounted on the exterior of the generator enclosure shall be permitted to satisfy the requirements of this section. The shutdown device shall be marked as the Generator Emergency Shutdown, and the label shall meet the requirements of 110.21(B) .

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
CMP13_FR9028_445.18_455.19_FINAL.docx	FOR STAFF USE - This shows all section moves and edits in more detail.	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 10:34:08 EST 2021

Committee Statement

Committee Statement: This revision creates a new section to separate the generator emergency shutdown and disconnect requirements for clarity. Additional modifications are made to clarify the permitted locations for emergency shutdown devices and marking. Section 445.18(B) is revised from “paralleling equipment” to “paralleling system bus” to clarify the intent of the requirement.

(PI 2594) The requirements in Articles 700, 701, 702, and 708 are specific in nature to those specific installations and outside the scope of Article 445.

(PI 1321) The proposed requirement for barriers is not added as it is better addressed in the product standard.

Response Message: FR-9028-NFPA 70-2021

[Public Input No. 2595-NFPA 70-2020 \[New Section after 445.18\(E\)\]](#)

[Public Input No. 2594-NFPA 70-2020 \[Section No. 445.18\]](#)

[Public Input No. 2626-NFPA 70-2020 \[Section No. 445.18\(D\)\]](#)

[Public Input No. 1321-NFPA 70-2020 \[Section No. 445.18\(E\)\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

- 18 Affirmative All
- 0 Affirmative with Comments
- 1 Negative with Comments
- 0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Negative with Comment

Grover, Matthew B

The majority of the changes proposed here are beneficial, however the changes to the requirements for one- and two-family dwellings in 445.19 (C) creates the potential for a situation so hazardous as to override the benefit of the rest of the FR. Residential generators are commonly located on roofs, freestanding structures intended to elevate them above a flood plain, or in other locations that are not readily accessible. Allowing the shutdown device to be located on the generator could make it difficult for first responders or occupants to quickly access the device. In an emergency it can be of the utmost importance to shut of any and all sources of power to limit damage to the structure or harm to the occupants. In anyway delaying a shutdown should be unacceptable from a safety perspective. As shutdown devices are commonly factory installed on residential generator enclosures, it could make sense to allow such an installation if it was limited only to generators that themselves are readily accessible.

**First Revision No. 8993-NFPA 70-2021 [Section No. 445.20(B)]****(B) Bonded Neutral Generators.**

Bonded generators shall be provided with GFCI protection on all 125-volt, 15- and 20-ampere receptacle outlets.

Informational Note: ~~Refer to~~ See 590.6(A)(3) for GFCI requirements for 15-kW or smaller portable generators used for temporary electric power and lighting.

Exception to (A) and (B): If the generator was manufactured or remanufactured prior to January 1, 2015, listed cord sets or devices incorporating listed GFCI protection for personnel identified for portable use shall be permitted.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 14:40:41 EST 2021

Committee Statement

Committee Statement: Revised to conform with the Style Manual 3.1.3.1 and 4.1.3.

Response Message: FR-8993-NFPA 70-2021

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9030-NFPA 70-2021 [Section No. 480.1]****480.1 Scope.**

This article applies to all stationary installations of storage batteries installations of stationary standby batteries composed of lead-acid or nickel-cadmium cells .

Informational Note No. 1: See Article 706 for installations that do not meet the definition of stationary standby batteries or are composed of cells other than lead-acid or nickel-cadmium.

Informational Note No. 2: The following standards are frequently referenced for the installation of stationary batteries:

- (1) IEEE 484, *Recommended Practice for Installation Design and Installation of Vented Lead-Acid Batteries for Stationary Applications*
- (2) IEEE 485, *Recommended Practice for Sizing Vented Lead-Acid Storage Batteries for Stationary Applications*
- (3) IEEE 1145, *Recommended Practice for Installation and Maintenance of Nickel-Cadmium Batteries for Photovoltaic (PV) Systems*
- (4) IEEE 1187, *IEEE Recommended Practice for Installation Design, and Installation of Valve-Regulated Lead-Acid Batteries for Stationary Applications*
- (5) IEEE 1375, *IEEE Guide for the Protection of Stationary Battery Systems*
- (6) IEEE 1578, *Recommended Practice for Stationary Battery Electrolyte Spill Containment and Management*
- (7) IEEE 1635/ASHRAE 21, *Guide for the Ventilation and Thermal Management of Batteries for Stationary Applications*
- (8) UL 1973, *Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power, and Light Electric Rail (LER) Applications*
- (9) UL Subject 2436, *Outline of Investigation for Spill Containment for Stationary Lead Acid Battery Systems*
- (10) UL 1989, *Standard for Standby Batteries*
- (11) UL Subject 1974, *Standard for Evaluation of Repurposed Batteries*
- (12) NFPA 855 -2020, Standard for the Installation of Stationary Energy Storage Systems

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 11:12:24 EST 2021

Committee Statement

Committee Statement: The scope has been updated to be consistent with the title change (made in TG4-1) and further limit the scope of this article to lead-acid and nickel-cadmium cells.

A new Informational Note No. 1 is added to reference Article 706 for installations of batteries that do not fall within the scope of Article 480.

The reference to NFPA 855 has been added to the Informational Note.

Response FR-9030-NFPA 70-2021
Message:

[Public Input No. 3879-NFPA 70-2020 \[Section No. 480.1\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters
3 Not Returned
18 Affirmative All
0 Affirmative with Comments
1 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

Negative with Comment

Czarnecki, Neil A.

The changes to the scope of Article 480 limit the application of the requirements to solely lead-acid or nickel-cadmium battery chemistries without replacement or additional requirements for other chemistry types within the NEC. The industry is moving to lithium-ion based chemistries for stationary standby

batteries and this revision creates a requirement void in the NEC. Stationary standby batteries are not considered energy storage systems (ESS) in terms of product safety standards and application so the informational note directing users to Article 706 is not appropriate and adds confusion. Standards such as UL 1973 listed in informational note 2 apply to all battery chemistries and provide the certification requirements to meet the 480.3 listing requirement.



First Revision No. 9042-NFPA 70-2021 [Definition: Container.]

Container (as applied to batteries) .

A single-cell or multicell vessel or jar that holds the plates, electrolyte, and other elements of a single unit in a battery. (CMP-13)

~~Informational Note: A container may be single-cell or multi-cell and is sometimes referred to in the industry as a "jar."~~

Submitter Information Verification

Committee: NEC-P13

Submission Date: Thu Jan 14 11:32:23 EST 2021

Committee Statement

Committee Statement: The Definition of container is revised and its Informational Note deleted for compliance with 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-9042-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9043-NFPA 70-2021 [Definition: Nominal Voltage (Battery or Cell).]

Nominal Voltage (Battery as applied to battery_ or Cell cell).

The value assigned to a cell or battery of a given voltage class for the purpose of convenient designation. The operating voltage of the cell or battery may vary above or below this value. (CMP-13)

Informational Note: The most common nominal cell voltages are 2 volts per cell for the lead-acid systems batteries , 1.2 volts per cell for alkali systems batteries , and ~~3-6~~ 3.2 to 3.8 volts per cell for Li-ion systems batteries . Nominal voltages might vary with different chemistries.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 11:36:17 EST 2021

Committee Statement

Committee Statement: The voltage range for Li-ion batteries In the Informational Note is changed to 3.2-3.8 volts to reflect current battery technology.

Also, “systems” was changed to “batteries” to align with the changes to the scope of this article.

Response Message: FR-9043-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Negative with Comment

Grover, Matthew B

This addition is unnecessary. The existing definition of "voltage, nominal" is sufficient to cover batteries. If this addition is to be made, the term should be changed to "voltage, nominal as applied to battery cell" to located it with the other definitions related to voltage.

**First Revision No. 9046-NFPA 70-2021 [Definition: Storage Battery (Battery).]****~~Storage Battery (Battery) .~~**

~~A single cell or a group of rechargeable cells connected together electrically in series, in parallel, or a combination of both, and comprised of lead-acid, nickel-cadmium, or other rechargeable electrochemical types . (CMP-13)~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 11:40:51 EST 2021

Committee Statement

Committee Statement: The definition of "storage battery" was changed to "battery" and the text revised to be consistent with the definition of "battery" in NFPA 855.

Response Message: FR-9046-NFPA 70-2021

Public Input No. 4169-NFPA 70-2020 [Definition: Storage Battery (Battery).]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9052-NFPA 70-2021 [Section No. 480.4(A)]****(A) Corrosion Prevention.**

Where mating dissimilar metals, antioxidant material suitable for the battery connection shall be used where recommended by the battery ~~manufacturer~~ manufacturer's installation and instruction manual.

~~Informational Note: The battery manufacturer's installation and instruction manual can be used for guidance for acceptable materials.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:05:27 EST 2021

Committee Statement

Committee Statement: The Informational Note is revised for compliance with 3.1.3 of the NEC Style Manual.

Response Message: FR-9052-NFPA 70-2021

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9059-NFPA 70-2021 [Sections 480.7(A), 480.7(B)]****(A) Disconnecting Means.**

A disconnecting means shall be provided for all ungrounded conductors derived from a stationary ~~standby battery system~~ with a voltage over 60 volts dc. A disconnecting means shall be readily accessible and located within sight of the stationary standby battery system.

Informational Note: See 240.21(H) for information on the location of the overcurrent device for battery conductors.

(B) Emergency Disconnect.

For one-family and two-family dwellings, a disconnecting means or its remote control for a stationary ~~standby battery system~~ shall be located at a readily accessible location outside the building for emergency use. The disconnect shall be labeled “EMERGENCY DISCONNECT” as follows:

EMERGENCY DISCONNECT

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:22:52 EST 2021

Committee Statement

Committee Statement: References to “stationary battery system” and “battery system” are changed to “stationary standby battery” to align with the changes to the scope of this article.

Response Message: FR-9059-NFPA 70-2021

Public Input No. 4321-NFPA 70-2020 [Section No. 480.7(A)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

The requirements in subdivision (B) are unnecessary, as currently stationary batteries are not in use in one-family dwellings. If such installations do or will exist, an exception is needed for small installations. Excluding batteries under 20 kWh in one- and two-family dwellings as proposed in FR 9079 (applying to 706.7), would improve this proposed change.



First Revision No. 9056-NFPA 70-2021 [Section No. 480.7(D)]

(D) Remote Actuation.

Where a disconnecting means, located in accordance with 480.7(A), is provided with remote controls to activate the disconnecting means and the controls for the disconnecting means are not located within sight of the stationary standby battery ~~system~~, the disconnecting means shall be capable of being locked in the open position, in accordance with 110.25, and the location of the controls shall be field marked on the disconnecting means.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:17:19 EST 2021

Committee Statement

Committee Statement: The reference to “stationary battery system” is changed to “stationary standby battery” to align with the changes to the scope of this article.

Response Message: FR-9056-NFPA 70-2021

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Curin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9060-NFPA 70-2021 [Section No. 480.7(F)]****(F) Notification.**

The disconnecting means shall be legibly marked in the field. A label with the marking shall be placed in a conspicuous location near the battery if a disconnecting means is not provided. The marking shall be of sufficient durability to withstand the environment involved and shall include the following:

- (1) Nominal battery voltage
- (2) Available fault current derived from the stationary standby ~~battery system~~

Informational Note: Battery equipment suppliers can provide information about available fault current on ~~any particular~~ specific battery models .

- (3) An arc flash label in accordance with acceptable industry practice

Informational Note: See NFPA 70E-2018 2021 , *Standard for Electrical Safety in the Workplace*, ~~provides for~~ assistance in determining the severity of potential exposure, planning safe work practices, arc flash labeling, and selecting personal protective equipment.

- (4) Date the calculation was performed

Exception: List items (2), (3), and (4) shall not apply to one- and two-family dwellings.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:26:46 EST 2021

Committee Statement

Committee Statement: The reference to “stationary battery system” is changed to “stationary standby battery” to align with the changes to the scope of this article.

The Informational Note to 480.7(F)(2) is revised for compliance with 3.1.3 of the NEC Style Manual.

The Informational Note to 480.7(F)(3) is revised for compliance with 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-9060-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9062-NFPA 70-2021 [Section No. 480.7(G)]****(G) Identification of Power Sources.**

~~Battery systems~~ Stationary standby batteries shall be indicated by 480.7(G)(1) and (G)(2).

(1) Facilities with Utility Services and ~~Battery Systems~~ Stationary Standby Batteries .

Plaques or directories shall be installed in accordance with 705.10 and 712.10.

Exception: This requirement does not apply where a disconnect in 480.7(A) is not required.

(2) Facilities with Stand-Alone Systems.

A permanent plaque or directory shall be installed in accordance with 710.10.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:30:32 EST 2021

Committee Statement

Committee Statement: The references to “battery systems” are changed to “stationary standby batteries” to align with the changes to the scope of this article.

Response Message: FR-9062-NFPA 70-2021

Public Input No. 4323-NFPA 70-2020 [Section No. 480.7(G)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9063-NFPA 70-2021 [Section No. 480.10(A)]****(A) Ventilation.**

Provisions appropriate to the battery technology shall be made for sufficient diffusion and ventilation of gases from the battery, if present, to prevent the accumulation of an explosive mixture.

Informational Note No. 1: See NFPA 1-2018 2021 , *Fire Code*, Chapter 52, for ventilation considerations for specific battery chemistries.

Informational Note No. 2: Some battery technologies do not require ventilation.

Informational Note No. 3: ~~For additional information on the ventilation of stationary battery systems, see~~ See IEEE Std 1635-2012/ASHRAE Guideline 21-2012, *Guide for the Ventilation and Thermal Management of Batteries for Stationary Applications*, for additional information on the ventilation of stationary battery systems .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:34:26 EST 2021

Committee Statement

Committee Statement: Informational Note No. 3 is revised for compliance with 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-9063-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 9064-NFPA 70-2021 [Section No. 480.10(C)]****(C) Spaces About ~~Battery Systems~~ Stationary Standby Batteries .**

Spaces about ~~battery systems~~ stationary standby batteries shall comply with 110.26 and 110.34. Working space shall be measured from the edge of the battery cabinet, racks, or trays.

For battery racks, there shall be a minimum clearance of 25 mm (1 in.) between a cell container and any wall or structure on the side not requiring access for maintenance. Battery stands shall be permitted to contact adjacent walls or structures, provided that the battery shelf has a free air space for not less than 90 percent of its length.

Informational Note: Additional space is often needed to accommodate battery hoisting equipment, tray removal, or spill containment.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:37:29 EST 2021

Committee Statement

Committee Statement: The references to “battery systems” are changed to “stationary standby batteries” to align with the changes to the scope of this article.

Response Message: FR-9064-NFPA 70-2021

Public Input No. 4329-NFPA 70-2020 [Section No. 480.10(C)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9066-NFPA 70-2021 [Section No. 480.10(D)]****(D) Top Terminal Batteries.**

Where top terminal batteries are installed on tiered racks or on shelves of battery cabinets, working space in accordance with the battery manufacturer's instructions shall be provided between the highest point on a cell and the row, shelf, or ceiling above that point.

Informational Note: See IEEE 1187-2013, *IEEE Recommended Practice for Installation Design and Installation of Valve-Regulated Lead-Acid Batteries for Stationary Applications*, provides for guidance for top clearance of valve-regulated lead-acid batteries, which are commonly used in battery cabinets.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:40:26 EST 2021

Committee Statement

Committee Statement: The Informational Note is revised for compliance with 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-9066-NFPA 70-2021

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9068-NFPA 70-2021 [Section No. 480.10(E)]

(E) Egress.

Personnel doors intended for entrance to, and egress from, rooms designated as battery rooms shall open at least 90 degrees in the direction of egress and shall be equipped with listed panic or listed fire exit hardware.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:43:20 EST 2021

Committee Statement

Committee Statement: Doors must be able to open at least 90 degrees in order for personnel to escape danger in an emergency situation such as an electrical explosion or arc flash event.

Response Message: FR-9068-NFPA 70-2021

Public Input No. 3568-NFPA 70-2020 [Section No. 480.10(E)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

This change addresses the all too common occurrence of an egress door being technically operable, but partially obstructed. This is an important change to improve personnel safety.

**First Revision No. 9069-NFPA 70-2021 [Section No. 480.10(G)]****(G) Illumination.**

Illumination shall be provided for working spaces containing ~~battery systems~~ stationary standby batteries . The lighting outlets shall not be controlled by automatic means only. Additional lighting outlets shall not be required where the work space is illuminated by an adjacent light source. The location of luminaires shall not cause the following :

- (1) Expose personnel to energized battery components while performing maintenance on the luminaires in the battery space; ~~or~~
- (2) Create a hazard to the battery upon failure of the luminaire.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:45:07 EST 2021

Committee Statement

Committee Statement: The reference to “battery systems” is changed to “stationary standby batteries” to align with the changes to the scope of this article.

Response Message: FR-9069-NFPA 70-2021

[Public Input No. 4333-NFPA 70-2020 \[Section No. 480.10\(G\)\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9070-NFPA 70-2021 [Section No. 480.12]****480.12 Battery Interconnections.**

Flexible cables, as identified in ~~Article- 400~~ Table 400.4 , in sizes 2/0 AWG and larger shall be permitted within the battery enclosure from battery terminals to a nearby junction box where they shall be connected to an approved wiring method. Flexible battery cables shall also be permitted between batteries and cells within the battery enclosure. Such cables shall be listed and identified for the environmental conditions. Flexible, fine-stranded cables shall only be used with terminals, lugs, devices, or connectors in accordance with 110.14.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 12:48:01 EST 2021

Committee Statement

Committee Statement: Section 4.1.4 of the 2020 NEC Style Manual prohibits references to an entire article, with the exception of Article 100. As the flexible cable types are identified in Table 400.4, reference to this specific table will correct the problem while complying with the style manual, and without changing the intent of the requirement.

Response Message: FR-9070-NFPA 70-2021

Public Input No. 4356-NFPA 70-2020 [Section No. 480.12]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9007-NFPA 70-2021 [Section No. 695.1(B)]****(B) Not Covered.**

This article does not cover the following:

- (1) The performance, maintenance, and acceptance testing of the fire pump system, and the internal wiring of the components of the system
- (2) The installation of pressure maintenance (jockey or makeup) pumps

Informational Note No. 1: ~~For See Article 430 for~~ the installation of pressure maintenance (jockey or makeup) pumps supplied by the fire pump circuit or another source, ~~see Article 430~~.

- (3) Transfer equipment upstream of the fire pump transfer switch(es)

Informational Note No. 2: See NFPA 20-2019, *Standard for the Installation of Stationary Pumps for Fire Protection*, for further information.

- (4) Water pumps installed in one- and two-family dwellings and used for fire suppression

Informational Note No. 3: See NFPA 13D-2019, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, for further information.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 16:03:27 EST 2021

Committee Statement

Committee Statement: Informational Note to 695.1(B)(2) has been revised to conform with the Style Manual 3.1.3.1 and 4.1.3.

Most pumps installed in one- and two-family dwellings are water pumps that follow the requirements in NFPA 13D and would be exempt from the requirements within this Article.

Depending on the size of the home there may be situations where the sprinkler system is designed in accordance with NFPA 13 or 13R which could necessitate the need for a listed fire pump and the installation requirements of Article 695.

Response Message: FR-9007-NFPA 70-2021

Public Input No. 1158-NFPA 70-2020 [Section No. 695.1(B)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9072-NFPA 70-2021 [Section No. 695.3(A)(3)]****(3) Dedicated Feeder.**

A dedicated feeder shall be permitted where it is derived from a service connection as described in 695.3(A)(1). [20:9.2.2(3)]

Informational Note: See NFPA 20-2019, *Standard for the Installation of Stationary Pumps for Fire Protection*, 9.2.2, for more information on normal power sources. Subsection 9.2.2(3) permits a “dedicated feeder” to be derived from a “dedicated service” disconnecting means. Subsection 9.2.2(5) permits a “dedicated transformer connection” that is supplied directly from a “dedicated service disconnecting means” where the service is not at utilization voltage.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 14:00:16 EST 2021

Committee Statement

Committee Statement: The present requirement in 695.3(A)(3) permits a dedicated feeder derived from a service connection as described in 695.3(A)(1). There are two methods to install an NEC compliant “dedicated feeder”.

The first method is to derive a dedicated feeder from a dedicated service, where the service voltage is at utilization voltage of the fire pump.

The second method is to derive a dedicated feeder from a dedicated service disconnect, through a transformer where the service voltage is not at utilization voltage of the fire pump. The word “dedicated” is added in front of “service” to the section to align with NFPA 20 extracted material.

Response Message: FR-9072-NFPA 70-2021

[Public Input No. 4573-NFPA 70-2020 \[Article 695\]](#)

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9073-NFPA 70-2021 [Section No. 695.3(C)(2)]****(2) Feeder and Alternate Source.**

A feeder shall be permitted as a normal power source ~~of power~~ if an alternate power source of ~~power~~ independent from the feeder is provided. The connection(s), overcurrent protective device(s), and disconnecting means for such feeders shall meet the requirements of 695.4(B)(1)(b).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 14:06:11 EST 2021

Committee Statement

Committee Statement: This revision modifies the references to power source to harmonize terminology with NFPA 99, 110 and 111.

Response Message: FR-9073-NFPA 70-2021

Public Input No. 4167-NFPA 70-2020 [Section No. 695.3(C)(2)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9599-NFPA 70-2021 [Section No. 695.3 [Excluding any Sub-Sections]]

Electric motor-driven fire pumps shall have a reliable source of power.

Informational Note: See NFPA 20 -2019, *Standard for the Installation of Stationary Pumps for Fire Protection*, Sections 9.3.2 and A.9.3.2 from NFPA 20 -2019, *Standard for the Installation of Stationary Pumps for Fire Protection*, for guidance on the determination of power source reliability.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 26 19:21:01 EST 2021

Committee Statement

Committee Statement: Revised to conform with the Style Manual 3.1.3.1 and 4.1.3.

Response Message: FR-9599-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9008-NFPA 70-2021 [Section No. 695.4(B)(1)]****(1) Number of Disconnecting Means.**

(a) *General.* A single disconnecting means and associated overcurrent protective device(s) shall be permitted to be installed between the fire pump power source(s) and one of the following: [20:9.1.2 9.2.3]

- (1) A listed fire pump controller
- (2) A listed fire pump power transfer switch
- (3) A listed combination fire pump controller and power transfer switch

(b) *Feeder Sources.* For systems installed under the provisions of 695.3(C) only, additional disconnecting means and the associated overcurrent protective device(s) shall be permitted.

(c) *On-Site Standby Generator.* Where an on-site standby generator is used to supply a fire pump, an additional disconnecting means and an associated overcurrent protective device(s) shall be permitted.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 16:15:38 EST 2021

Committee Statement

Committee Statement: The correct reference to NFPA 20 has been revised to 9.2.3.

Response Message: FR-9008-NFPA 70-2021

Public Input No. 923-NFPA 70-2020 [Section No. 695.4(B)(1)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

Affirmative with Comment

Little, Linda J.

The committee correctly updated the reference in NFPA 20 to 9.2.3 but this left the unintended consequence of a discrepancy between 9.2.3.1 in NFPA 20-2019 and the language in 695.4(B)(3)(1)(a). NFPA 20 requires the disconnecting means to be capable of being locked in both the closed and open position. The extract policy requires technical alignment with the parent document, so either the first sentence of 695.4(B)(3)(1)(a) should be modified or the extract must be updated.

**First Revision No. 9010-NFPA 70-2021 [Section No. 695.6(A)(2)]****(2) Feeders.**

Fire pump supply conductors on the load side of the final disconnecting means and overcurrent device(s) permitted by 695.4(B), or conductors that connect directly to an on-site standby generator, shall comply with all of the following:

- (1) *Independent Routing.* The conductors shall be kept entirely independent of all other wiring.
- (2) *Associated Fire Pump Loads.* The conductors shall supply only loads that are directly associated with the fire pump system.
- (3) *Protection from Potential Damage.* The conductors shall be protected from potential damage by fire, structural failure, or operational accident.
- (4) *Inside of a Building.* Where routed through a building, the conductors shall be protected from fire for 2 hours using one of the following methods:
 - a. The cable or raceway is encased in a minimum 50 mm (2 in.) of concrete.
 - b. The cable or raceway is part of a listed fire-resistive cable system.

Informational Note No. 1: ~~Fire-resistive cables are tested to ANSI/UL 2196-2017, Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables . See UL 2196, Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables , for one method of defining a fire-resistive cable system.~~

Informational Note No. 2: See UL Guide Information for Electrical Circuit Integrity Systems (FHIT) for identifying the system and its installation limitations to maintain a minimum 2-hour fire-resistive rating.

Informational Note No. 3: The listing organization provides information for fire-resistive cable systems on proper installation requirements to maintain the fire rating.

- c. The cable or raceway is protected by a listed electrical circuit protective system.

~~Informational Note No. 4: Electrical-circuit protective systems could include, but are not limited to, thermal barriers or a protective shaft and are tested in accordance with UL 1724, Fire Tests for Electrical Circuit Protection Systems . See UL 1724, Fire Tests for Electrical Circuit Protective Systems , for one method of defining an electrical circuit protective system.~~

Informational Note No. 5: See UL Guide Information for Electrical Circuit Integrity Systems (FHIT) for identifying the system and its installation limitations to maintain a minimum 2-hour fire-resistive rating.

Informational Note No. 6: The listing organization provides information for electrical circuit protective systems on proper installation requirements to maintain the fire rating.

Exception to 695.6(A)(2)(4): The supply conductors located in the electrical equipment room where they originate and in the fire pump room shall not be required to have the minimum 2-hour fire separation or fire-resistance rating unless otherwise required by 700.10(D) of this Code.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 16:25:15 EST 2021

Committee Statement

Committee Statement: The language is revised to reflect the proper title of the standard and deleting the reference to ANSI. The revision correlates information on circuit integrity cable throughout the NEC.

Revised the information notes to conform with the Style Manual 3.1.3.1 and 4.1.3.

Response Message: FR-9010-NFPA 70-2021

Public Input No. 2099-NFPA 70-2020 [Section No. 695.6(A)(2)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters
3 Not Returned
17 Affirmative All
2 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

Affirmative with Comment

Caron, Daniel J.

Although I agree with FR 9010, I disagree with the Panel action to resolve PI's 1035 and 3685. The issue of concrete thickness vs. fire rating has been debated in Panel 13 for many cycles prompting the NFPA Research Foundation to conduct a comprehensive study in December 2018. The study was conducted to determine the proper thickness of concrete to achieve a 2-hour fire rating. The study concludes definitively that 2 inches of concrete, regardless of the type of concrete used, DOES NOT achieve a 2-hour fire rating. Although different types of concrete achieve a 2-hour fire rating at different thicknesses, and the study concluded that 5 inches of any type of concrete do achieve the required fire rating, this Panel should not simply resolve the PI's because it thinks a thickness of 5" is onerous. This Panel should have created a first revision, with performance criteria, using language such as; "The cable or raceway is encased in concrete with a thickness sufficient to achieve a 2-hour fire rating."; and a Fine Print Note referencing the NFPA Research Foundation report.

Conrad, James S.

I agree with the action on FR-9010 which addressed PI 2099 for section 695.6(A)(2) or more specifically 695.6(A)(2)(4)b - fire resistive cables system and 695.6(A)(2)(4)c - electrical circuit protective system. Section 695.6(A)(2)(4) requires feeder conductors that are routed through the building be protected from fire for 2 hours which both 695.6(A)(2)(4)b and 695.6(A)(2)(4)c provide. However, CMP-13 resolved PI 3685 for section 695.6(A)(2)(4)a, which allows 2 inches of concrete encasement for a 2-hour rating. Part of the committee statement for PI 3685 states "It is understood that 2-inches of concrete may not equal a 2-hour fire rating. The engineer must determine the fire rating based on many factors including the mix or aggregate of concrete." CMP-13 needs to make sure all 3 methods meet the requirements of 695.6(A)(2)(4) and needs to revisit this section during the second draft meeting.

**First Revision No. 9012-NFPA 70-2021 [Section No. 695.6(B)(1)]****(1) Fire Pump Motors and Other Equipment.**

Conductors supplying a fire pump motor(s), pressure maintenance pumps, and associated fire pump accessory equipment shall have ~~a rating an ampacity of~~ not less than ~~the sum of the following: 125 percent of the sum of the fire pump motor(s) and pressure maintenance motor(s) full-load current(s), and 100 percent of the associated fire pump accessory equipment.~~

- (1) 125 percent of the sum of the fire pump motor(s) and pressure maintenance motor(s) full-load current(s), as determined by 430.6(A)
- (2) 100 percent of the associated fire pump accessory equipment full-load current(s)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 16:40:22 EST 2021

Committee Statement

Committee Statement: The term “rating” has been changed to “ampacity” as that is the proper term for conductors. The requirements have been put into a list format for clarity.

Response Message: FR-9012-NFPA 70-2021

Public Input No. 1391-NFPA 70-2020 [Section No. 695.6(B)(1)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9014-NFPA 70-2021 [Section No. 695.6(D)]****(D) Pump Wiring.**

All wiring from the controllers to the pump motors shall be in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit, listed Type MC cable with an impervious covering, or Type MI cable. Electrical connections at motor terminal boxes shall be made with a listed means of connection. Twist-on, insulation-piercing-type, and soldered wire connectors shall not be permitted to be used for this purpose.

(1) Wiring Methods.

All wiring Wiring from the controller(s) to the pump motors shall be in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit Type LFNC-B , listed Type MC cable with an impervious covering, or Type MI cable. [20: 9.4.4.1]

(2) Fittings.

Fittings shall be listed for use in wet locations.

(3) Connections.

Electrical connections at motor terminal boxes shall be made with a listed means of connection. Twist-on, insulation-piercing-type, and soldered wire connectors shall not be permitted to be used for this purpose. [20: 9.4.4.2, 9.4.4.3]

Submitter Information Verification

Committee: NEC-P13

Submission Date: Wed Jan 13 16:44:13 EST 2021

Committee Statement

Committee Statement: The restructuring of the section improves clarity, requires fitting to be listed for wet locations. In addition, the revision identifies the extracted sections from NFPA 20.

Response Message: FR-9014-NFPA 70-2021

Public Input No. 3700-NFPA 70-2020 [Section No. 695.6(D)]

Public Input No. 889-NFPA 70-2020 [Section No. 695.6(D)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9016-NFPA 70-2021 [Section No. 695.6(H)]****(H) Listed Electrical Circuit Protective System to Controller Wiring.**

Electrical circuit protective system installation shall comply with any restrictions provided in the listing of the electrical circuit protective system used, and the following also shall apply:

- (1) A junction box shall be installed ahead of the fire pump controller a minimum of 300 mm (12 in.) beyond the fire-rated ceiling, wall, or floor bounding the fire zone.
- (2) Where required by the manufacturer of a listed electrical circuit protective system or by the listing, or as required elsewhere in this *Code*, the raceway between a junction box and the fire pump controller shall be sealed at the junction box end as required and in accordance with the instructions of the manufacturer. [20:9.8.2]
- (3) Standard wiring between the junction box and the controller shall be permitted. [20:9.8.3]

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 16:50:03 EST 2021

Committee Statement

Committee Statement: "Ceiling" has been added to identify the entire fire pump room must be fire-rated.

Response Message: FR-9016-NFPA 70-2021

Public Input No. 428-NFPA 70-2020 [Section No. 695.6(H)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9017-NFPA 70-2021 [Section No. 695.7]****695.7 Voltage Drop.****(A) Motor Starting.**

~~The~~ Unless the requirements of 695.7(B) or (C) are met, ~~the~~ voltage at the fire pump controller line terminals shall not drop more than 15 percent below normal (controller-rated voltage) under motor starting conditions. [~~20:~~ 9.4.1]

~~Exception: This limitation shall not apply for emergency run mechanical starting. [20: 9.4.2]~~

(B) Emergency Run.

The requirements of 695.7(A) shall not apply to emergency-run mechanical starting, provided a successful start can be demonstrated on the standby generator system. [~~20:~~ 9.4.2]

(C) Bypass Mode.

The requirements of 695.7(A) shall not apply to the bypass mode of a variable speed pressure limiting control, provided a successful start can be demonstrated on the standby gen-set. [~~20:~~ 9.4.3]

(D) Motor Running.

The voltage at the ~~contactor(s)~~ load terminals of the fire pump controller to which the motor is connected shall not drop more than 5 percent below the voltage rating of the motor connected to those terminals when the motor is operating at 115 percent of the full-load current rating of the motor. [~~20:~~ 9.4.4]

Submitter Information Verification

Committee: NEC-P13

Submission Date: Wed Jan 13 16:56:25 EST 2021

Committee Statement

Committee Statement: Text has been revised to correlate with NFPA 20 to additionally recognize “emergency run”, “bypass mode”, and multiple editorial revisions for clarity.

Response Message: FR-9017-NFPA 70-2021

Public Input No. 3704-NFPA 70-2020 [Section No. 695.7]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnolito L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

The word "contractor(s)" in subsection (D) should be changed to "contactor(s)"

**First Revision No. 9019-NFPA 70-2021 [Section No. 695.14(F)]****(F) Generator Control Wiring Methods.**

Control conductors installed between the fire pump power transfer switch and the standby generator supplying the fire pump during normal power loss shall be kept entirely independent of all other wiring. The integrity of the generator remote start circuit shall be monitored for broken, disconnected, or shorted wires. Loss of integrity shall start the generator(s).

Informational Note: See NFPA 20-2019, *Standard for the Installation of Stationary Pumps for Fire Protection*, Section 3.3.7.2, for more information on fault-tolerant external control circuits.

The control conductors shall be protected to resist potential damage by fire or structural failure. Where routed through a building, the conductors shall be protected from fire for 2 hours using one of the following methods:

- (1) The cable or raceway is encased in a minimum 50 mm (2 in.) of concrete.
- (2) The cable or raceway is part of a listed fire-resistive cable system.

Informational Note No. 1: ~~Fire-resistive cables are tested to ANSI/~~ See UL 2196-2017, *Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, for testing requirements for fire-resistive cables .

Informational Note No. 2: The listing organization provides information for fire-resistive cable systems on proper installation requirements to maintain the fire rating.

- (3) The cable or raceway is protected by a listed electrical circuit protective system.

Informational Note No. 3: ~~Electrical~~ See UL 1724, *Fire Tests for Electrical Circuit Protection Systems* , for testing requirements for circuit protective systems ~~could include, but are not limited to, thermal barriers or a protective shaft and are tested in accordance with UL 1724, Fire Tests for Electrical Circuit Protection Systems .~~

Informational Note No. 4: Electrical circuit protective systems could include, but are not limited to, thermal barriers or a protective shaft.

Informational Note No. 5: The listing organization provides information for electrical circuit protective systems on proper installation requirements to maintain the fire rating.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 17:17:14 EST 2021

Committee Statement

Committee Statement: The language is revised to reflect the proper title of the standard and deleting the reference to ANSI. The revision correlates information on circuit integrity cable throughout the NEC.

Informational notes have been revised to conform with the Style Manual 3.1.3.1 and 4.1.3.

Response Message: FR-9019-NFPA 70-2021

Public Input No. 2100-NFPA 70-2020 [Section No. 695.14(F)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

17 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Caron, Daniel J.

Although I agree with FR 9019, I disagree with the Panel action to resolve PI's 1034 and 3707 . The issue of concrete thickness vs. fire rating has been debated in Panel 13 for many cycles prompting the NFPA Research Foundation to conduct a comprehensive study in December 2018. The study was conducted to determine the proper thickness of concrete to achieve a 2-hour fire rating. The study concludes definitively that 2 inches of concrete, regardless of the type of concrete used, DOES NOT achieve a 2-hour fire rating. Although different types of concrete achieve a 2-hour fire rating at different thicknesses, and the study concluded that 5 inches of any type of concrete do achieve the required fire rating, this Panel should not simply resolve the PI's because it thinks a thickness of 5" is onerous. This Panel should have created a first revision, with performance criteria, using language such as; "The cable or raceway is encased in concrete with a thickness sufficient to achieve a 2-hour fire rating."; and a Fine Print Note referencing the NFPA Research Foundation report.

Conrad, James S.

I agree with the action on FR-9019 which addressed PI 2100 for section 695.14(F) or more specifically 695.14(F)(2) - fire resistive cables system and 695.14(F)(3) – electrical circuit protective system. Section 695.14(F) requires control conductors that are routed through the building be protected from fire for 2 hours which both 695.14(F)(1) and 695. 14(F)(2) provide. However, CMP-13 resolved PI 1034 & 3707 for section 695. 14(F)(1), which allows 2 inches of concrete encasement for a 2-hour rating. Part of the committee statement for PI 1034 & 3707 states “It is understood that 2-inches of concrete may not equal a 2-hour fire rating. The engineer must determine the fire rating based on many factors including the mix or aggregate of concrete.” CMP-13 needs to make sure all 3 methods meet the requirements of 695.14(F) and needs to revisit this section during the second draft meeting.

**First Revision No. 9020-NFPA 70-2021 [Section No. 695.15]****695.15** Surge Protection.

A listed surge protection protective device (SPD) shall be installed in or on the fire pump controller.

Exception: Surge-protective devices shall not be required in or on a fire pump controller for diesel fire pumps.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 17:41:59 EST 2021

Committee Statement

Committee Statement: The title of 695.15 is correctly identified as Surge Protection. "Surge protection device" has been revised to "surge protective device" (SPD). An exception has been added to clarify that surge protection is not required in a diesel fire pump controller.

Response Message: FR-9020-NFPA 70-2021

[Public Input No. 1450-NFPA 70-2020 \[Section No. 695.15\]](#)

[Public Input No. 3721-NFPA 70-2020 \[Section No. 695.15\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8773-NFPA 70-2021 [Section No. 700.1]****700.1 Scope.**

This article applies 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.

Informational Note No. 1: 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 communications systems, industrial processes where current interruption would produce serious life safety or health hazards, and similar functions.

Informational Note No. 2: For See Article 517, Health Care Facilities, for further information regarding wiring and installation of emergency systems in health care facilities, see Article 517 .

Informational Note No. 3: For See NFPA 99 -2018, Health Care Facilities Code , for further information regarding performance and maintenance of emergency systems in health care facilities, see NFPA 99 -2018, Health Care Facilities Code .

Informational Note No. 4: For See NFPA 101 -2018, Life Safety Code , for specification of locations where emergency lighting is considered essential to life safety, see NFPA 101 -2018, Life Safety Code .

Informational Note No. 5: For further information regarding performance of emergency and standby power systems, see See NFPA 110-2019, Standard for Emergency and Standby Power Systems, and NFPA 111 -2019, Standard on Stored Electrical Energy Emergency and Standby Power Systems , for further information regarding performance of emergency and standby power systems. Emergency systems are considered Level 1 systems when applying NFPA 110 .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 11:03:44 EST 2021

Committee Statement

Committee Statement: A reference to NFPA 111 is added to correlate with other actions to align NFPA 110, 111 and 70. This clarifies that emergency systems are considered level one systems when applying NFPA 110. Info notes were renumbered accordingly.

Revisions to the informational notes are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8773-NFPA 70-2021

[Public Input No. 1794-NFPA 70-2020 \[Section No. 700.1\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Curran, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8776-NFPA 70-2021 [Definition: Branch-Circuit Emergency Lighting Transfer Swit...]

Branch-Circuit Emergency Lighting Transfer Switch, Branch-Circuit Emergency Lighting (Branch-Circuit Emergency Lighting Transfer Switch) .

~~This definition shall apply only within this article.~~

A device connected on the load side of a branch-circuit overcurrent protective device that transfers only emergency lighting loads from the normal supply power source to an emergency supply power source . (700) (CMP-13)

Informational Note: See ANSI/UL 1008, Transfer Switch Equipment, for information covering branch-circuit emergency lighting transfer switches.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 11:59:28 EST 2021

Committee Statement

Committee Statement: In the definition of “Branch-Circuit Emergency Lighting Transfer Switch” changing “supply” to “power source” harmonizes terminology between NFPA70, 99, 110, and 111. This will increase clarity.

Response Message: FR-8776-NFPA 70-2021

Public Input No. 4164-NFPA 70-2020 [Definition: Branch-Circuit Emergency Lighting Transfer Swit...]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 8777-NFPA 70-2021 [Definition: Emergency Luminaire, Directly Controlled.]

Emergency Luminaire, Emergency, Directly Controlled. (Directly Controlled Emergency Luminaire)

An emergency A luminaire that has supplied by the facility emergency power system and with a control input for an integral dimming or switching function that drives the luminaire to the required that provides an emergency illumination level upon loss of normal power. (700) (CMP-13)

Informational Note: See ANSI/UL 924, Emergency Lighting and Power Equipment, for information covering directly controlled emergency luminaires.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 12:02:22 EST 2021

Committee Statement

Committee Statement: When this definition was revised in the 2020 edition of the NEC, the informational note was missed. The word "emergency" needs to be added. In addition, wording of this definition was modified to respond to the first revision in 700.24 for correlation.

Response Message: FR-8777-NFPA 70-2021

Public Input No. 667-NFPA 70-2020 [Definition: Emergency Luminaire, Directly Controlled.]

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8775-NFPA 70-2021 [Definition: Emergency Systems.]****Emergency Systems.**

~~This definition shall apply within this article and throughout the Code.~~

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. (CMP-13)

~~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 communications systems, industrial processes where current interruption would produce serious life safety or health hazards, and similar functions.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 11:44:25 EST 2021

Committee Statement

Committee Statement: All definitions of 700.2 are being moved to Article 100 to align with the NEC Style Manual. The language of Informational Note No. 1 of "Emergency Systems" has been deleted since it was added to 700.1 (new Info Note No.1) so that it is maintained in Article 700 after the definitions are moved.

Response Message: FR-8775-NFPA 70-2021

Public Input No. 4162-NFPA 70-2020 [Definition: Emergency Systems.]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9604-NFPA 70-2021 [Definition: Relay, Automatic Load Control.**

]

Relay, Automatic Load Control (Automatic Load Control Relay) .

A An emergency lighting control device used to set normally dimmed or normally-off switched emergency lighting equipment to full power illumination levels in the event of a loss of the normal supply by bypassing the dimming/switching controls, and to return the emergency lighting equipment to normal status when the device senses the normal supply has been restored. (700) (CMP-13)

Informational Note: See ANSI/UL 924, Emergency Lighting and Power Equipment, for the requirements covering automatic load control relays.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 27 16:06:35 EST 2021

Committee Statement

Committee Statement: Adding wording that an automatic load control relay (ALCR) is an emergency lighting control device adds clarity to the listing requirements of "all emergency lighting control devices (ELCD's)" in 700.16(B). However, an ALCR is a unique ELCD that only sets the target lighting equipment to full power by bypassing normal dimming/switching controls. There are other ELCD's that set the target lighting equipment to a required illumination level other than full power, but they are not ALCR's.

Response Message: FR-9604-NFPA 70-2021

Public Input No. 2202-NFPA 70-2020 [Definition: Relay, Automatic Load Control.]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 8784-NFPA 70-2021 [Section No. 700.3(A)]****(A) Conduct or Commissioning Witness Test.**

The authority having jurisdiction shall conduct or witness ~~a test~~ the commissioning and testing of the complete system upon installation and periodically afterward.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 12:54:36 EST 2021

Committee Statement

Committee Statement: Revisions are made to clarify that the emergency system must be commissioned prior to being placed into active service.

Response Message: FR-8784-NFPA 70-2021

[Public Input No. 2880-NFPA 70-2020 \[Section No. 700.3\]](#)

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8785-NFPA 70-2021 [Section No. 700.3(E)]****(E) Testing Under Load.**

Means for testing all emergency lighting and power systems during maximum anticipated load conditions shall be provided.

Informational Note: For See NFPA 110 -2019, *Standard for Emergency and Standby Power Systems*, for information on testing and maintenance of emergency power supply systems (EPSSs), see NFPA 110 -2019, *Standard for Emergency and Standby Power Systems*.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 13:00:04 EST 2021

Committee Statement

Committee Statement: Revisions are made to conform with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8785-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8786-NFPA 70-2021 [Section No. 700.3(F)]

(F) Temporary Source of Power for Maintenance or Repair of the Alternate Source of Power.

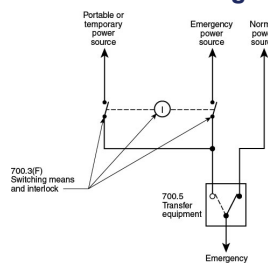
If the emergency system relies on a single alternate source of power, which will be disabled for maintenance or repair, the emergency system shall include permanent switching means to connect a portable or temporary alternate source of power, which that shall be available for the duration of the maintenance or repair. The permanent switching means to connect a portable or temporary alternate source of power shall comply with the following:

- (1) Connection to the portable or temporary alternate source of power shall not require modification of the permanent system wiring.
- (2) Transfer of power between the normal power source and the emergency power source shall be in accordance with 700.12.
- (3) The connection point for the portable or temporary alternate source shall be marked with the phase rotation and system bonding requirements.
- (4) ~~Mechanical or electrical interlocking shall~~ The switching means, including the interlocks, shall be listed and provided with mechanical or mechanical and electrical interlocking to prevent inadvertent interconnection of power sources.
- (5) The switching means shall include a contact point that shall annunciate at a location remote from the generator or at another facility monitoring system to indicate that the permanent emergency source is disconnected from the emergency system.
- (6) The permanent connection point for the temporary generator shall be located outdoors and shall not have cables from the connection point to the temporary generator routed through exterior windows, doors, or similar openings.
- (7) A permanent label shall be field applied at the permanent connection point to identify the system voltage, maximum amperage, short-circuit current rating of the load side of equipment supplied, and ungrounded conductor identification in accordance with 210.5.

It shall be permissible to utilize use manual switching to switch from the permanent source of power to the portable or temporary alternate source of power and to utilize use the switching means for connection of a load bank.

Informational Note: ~~There are~~ See Informational Note Figure 700.3(F) for one example of many possible methods to achieve the requirements of 700.3(F). ~~See Informational Note Figure 700.3(F) for one example.~~

Figure Informational Note Figure 700.3(F)



Exception: The permanent switching means to connect a portable or temporary alternate source of power, for the duration of the maintenance or repair, shall not be required where any of the following conditions exists:

- (1) All processes that rely on the emergency system source are capable of being disabled during maintenance or repair of the emergency source of power.
- (2) The building or structure is unoccupied and fire protection systems are fully functional and do not require an alternate power source.
- (3) Other temporary means can be substituted for the emergency system.
- (4) A permanent alternate emergency source, such as, but not limited to, a second on-site standby generator or separate electric utility service connection, capable of supporting the emergency system, exists.

Committee: NEC-P13

Submission Date: Mon Jan 11 13:07:53 EST 2021

Committee Statement

Committee Statement: This revision recognizes that permanent switching means required by 700.3 (F) to connect a portable or temporary alternate source of power has the responsibility to function as a transfer switch as noted in 700.3 (F) (2). Failure of such equipment to properly isolate the two out-of-phase sources from each other can result in catastrophic explosions and potential loss of life. As a result, this transfer switching means must be guaranteed to include all the safety features required for safe operation, and must be proven to perform properly under the worst-case conditions of operations. This can only be guaranteed by having the device Listed to the requirements of the ANSI standard for transfer switches.

The revision also clarifies that a permanent connection point is required in an accessible exterior location for the temporary source of power when the alternate source of power is unavailable. A permanent location will assure that access to the temporary source has been thought through and egress from the structure is not impaired. The revision also eliminates the potential of inadvertently leaving building openings "open" for transmission of emissions from the temporary source.

A new list item (7) is added to require permanent field applied labels at the connection point. This labeling is necessary to prevent the misapplication of a temporary power source.

Revisions to the informational note are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8786-NFPA 70-2021

[Public Input No. 2061-NFPA 70-2020 \[Section No. 700.3\(F\)\]](#)

[Public Input No. 2457-NFPA 70-2020 \[Section No. 700.3\(F\)\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8790-NFPA 70-2021 [Section No. 700.4(B)]****(B) Capacity.**

An emergency system shall have adequate capacity in accordance with Article 220 or by another approved method. The system capacity shall be sufficient for the rapid load changes and transient power and energy requirements associated with any expected loads.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 13:19:52 EST 2021

Committee Statement

Committee Statement: The addition of this new second sentence addresses the common condition where facilities relying on emergency systems have variable loads that can also have significant transient high-power conditions such as motor starting. This text makes it clear that these conditions must be taken into account when sizing the minimum capacity of these systems.

Response Message: FR-8790-NFPA 70-2021

Public Input No. 2789-NFPA 70-2020 [Section No. 700.4(B)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8791-NFPA 70-2021 [Section No. 700.4(C)]****(C) Selective Load Pickup, ~~and~~ Load Shedding, ~~and~~ Peak Load Shaving .**

The alternate power source shall be permitted to supply emergency, legally required standby, and optional standby system 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 the following in order of priority: ~~The alternate power source shall be permitted to be used for peak load shaving, provided these conditions are met.~~

- (1) ~~the emergency~~ Emergency circuits,
- (2) ~~the legally~~ Legally required standby circuits, ~~and~~
- (3) ~~the optional~~ Optional standby circuits, ~~in that order of priority.~~

~~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.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 13:23:28 EST 2021

Committee Statement

Committee Statement: This action removes "peak load shaving" from this first level subdivision as the requirements for parallel sources are now addressed in a new 700.4(D) titled "Parallel Operation". The application of peak load shaving is just one use case for these systems while operating in parallel with a normal source. The allowance for parallel operation of emergency sources to satisfy the test requirements in 700.3(B) has been moved without modification into the proposed new 700.4(D).

Response Message: FR-8791-NFPA 70-2021

[Public Input No. 2793-NFPA 70-2020 \[Section No. 700.4\(C\)\]](#)

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8793-NFPA 70-2021 [Section No. 700.5(A)]****(A) General.**

Transfer equipment shall be automatic, listed, and marked for emergency use, ~~and approved by the authority having jurisdiction~~ . Transfer equipment shall be designed and installed to prevent the inadvertent interconnection of normal and emergency sources of supply in any operation of the transfer equipment. Transfer equipment and electric power production systems installed to permit operation in parallel with the normal source shall meet the requirements of Article 705. Meter-mounted transfer switches shall not be permitted for emergency system use.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 14:13:48 EST 2021

Committee Statement

Committee Statement: The text "and approved by the AHJ" is deleted as it is redundant.

Response Message: FR-8793-NFPA 70-2021

Public Input No. 573-NFPA 70-2020 [Section No. 700.5(A)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8794-NFPA 70-2021 [Section No. 700.5(B)]

(B) Bypass Isolation Switches.

Means shall be permitted to bypass and isolate the transfer equipment. Where bypass isolation switches are used, inadvertent parallel operation shall be avoided. Where emergency loads are supplied by a single automatic transfer switch, the automatic transfer switch shall include a bypass isolation function to facilitate maintenance as required in 700.3(C) without jeopardizing continuity of power. When the automatic transfer switch has been bypassed to facilitate maintenance, the bypass switch shall automatically transfer the load between power sources upon loss of the connected power source, or it shall remain actively supervised by a qualified person who can manually initiate a transfer of the load between power sources. Where bypass isolation switches are used, inadvertent parallel operation shall be avoided.

Exception: The requirement for a bypass isolation transfer switch shall not apply where any of the following conditions exists:

- (1) All processes that rely on the emergency system source are capable of being disabled during maintenance or repair activities.
- (2) The building or structure is unoccupied and fire protection systems are fully functional and do not require an alternate power source.
- (3) Other temporary means shall be permitted to be substituted for the emergency system.
- (4) A permanent switching means to bypass the transfer equipment is provided to supply the connected load. The written procedures for bypassing the transfer equipment and ensuring operation by qualified persons shall be made available to the authority having jurisdiction. Where the switching means is not capable of automatically starting and transferring the load to the emergency source, the switching means shall be supervised and provisions for manually performing these functions shall be provided.
- (5) A written emergency plan that includes mitigation actions and responsibilities for qualified persons to address the recognized site hazards for the duration of the maintenance or repair activities shall be developed and implemented. The emergency plan shall be made available to the authority having jurisdiction.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 14:24:34 EST 2021

Committee Statement

Committee Statement: Installations where the emergency loads are served by a single transfer switch must have provisions to bypass the switch so that maintenance of the transfer switch can be performed. The exceptions to this requirement provide reasonable accommodation for installations where the site conditions or mitigation actions address the safety aspects during these activities.

Response Message: FR-8794-NFPA 70-2021

[Public Input No. 1327-NFPA 70-2020 \[Section No. 700.5\(B\)\]](#)

[Public Input No. 2231-NFPA 70-2020 \[Section No. 700.5\(B\)\]](#)

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnolito L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Negative with Comment

Caron, Daniel J.

The Statement of Problem and Substantiation for Public Input 1327 offers no information suggesting failures, or incidents are an issue, thus requiring this change. The requirement to mandate bypass isolation type transfer switches for emergency systems is an unnecessary hardship and unwarranted for a majority of building types/occupancies. Bypass isolation switches are approximately 2-3 times the cost of standard transfer switches, and require 2-3 times the area (equipment and clearance). With new construction costs trending well over \$500/gross square foot, this requirement will increase the cost of new construction by 10's of thousands of dollars.



First Revision No. 8796-NFPA 70-2021 [Section No. 700.5(D)]

(D) Use.

Transfer equipment shall supply only emergency loads.

Informational Note: Transfer equipment that supplies emergency loads provides separation of this load type from any others and is independent of any equipment used to combine or parallel sources.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 14:37:34 EST 2021

Committee Statement

Committee Statement: This informational note helps users understand that systems with multiple power sources often have transfer equipment associated with source interconnection or paralleling. Transfer equipment installed for these purposes is not used to separate emergency loads from other load types as required by this section.

Response Message: FR-8796-NFPA 70-2021

Public Input No. 2799-NFPA 70-2020 [Section No. 700.5(D)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

The added informational note is difficult to interpret especially when compared with the panel statement. The intent to differentiate the transfer equipment from the paralleling equipment is fine, but the added text serves to make this less, rather than more clear.

**First Revision No. 8798-NFPA 70-2021 [Section No. 700.6(C)]**

(C) Not Functioning Storage Battery Charging Malfunction .

To indicate that ~~the battery charger~~ a charging malfunction on a battery required for source readiness, including starting the prime mover, is not functioning.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 14:44:16 EST 2021

Committee Statement

Committee Statement: The title of this first level subdivision is revised to better describe the functional area of the alarm signal.

Additionally, the requirement was changed to align with the focus on battery charging and potential impact to source readiness.

Response Message: FR-8798-NFPA 70-2021

Public Input No. 2800-NFPA 70-2020 [Section No. 700.6(C)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Negative with Comment

Jonas, Jeff

The word "storage" should be removed from the title as agreed to in the CMP-13 meeting. Removing "storage" from the title avoids confusion with other technologies that store energy in a battery for purposes other than starting the prime mover.



First Revision No. 8808-NFPA 70-2021 [Section No. 700.6 [Excluding any Sub-Sections]]

Audible and visual signal , visual, and facility or network remote annunciation devices shall be provided, where practicable applicable , for the purpose described in 700.6(A) through (D).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 16:12:50 EST 2021

Committee Statement

Committee Statement: This revision now clarifies where signals are required. The word “practicable” is deleted and replaced with “applicable”. This mandates that signals be provided where they are applicable to the source. See action taken on PI-2801 and PI-3507 on 700.10(D)(4).

Response Message: FR-8808-NFPA 70-2021

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8801-NFPA 70-2021 [New Section after 700.8]****700.9 Cybersecurity.**

Emergency systems that are connected to a communication network and have the capability to permit control of any portion of the premises emergency electrical system shall comply with either of the following:

- (1) The ability to control the system is limited to a direct connection through a local nonnetworked interface.
- (2) It is connected through a networked interface complying with one of the following methods:
 - a. The system and associated software are identified as being evaluated for cybersecurity.
 - b. A cybersecurity assessment is conducted on the connected system to determine vulnerabilities to cyberattacks.

The cybersecurity assessment shall be conducted when the system configuration changes and at not more than 5-year intervals.

Documentation of the evaluation, assessment, and certification shall be made available to those authorized to inspect, operate, and maintain the system.

Informational Note No. 1: See ISA 62443, *Cybersecurity Standards* series; UL 2900, *Cybersecurity Standards* series; or the *NIST Framework for Improving Critical Infrastructure Cybersecurity*, Version 1.1, for assessment requirements.

Informational Note No. 2: Examples of the commissioning certification used to demonstrate the system has been investigated for cybersecurity vulnerabilities could be one of the following:

- (1) The ISA Security Compliance Institute (ISCI) conformity assessment program
- (2) Certification of compliance by a nationally recognized test laboratory
- (3) Manufacturer certification for the specific type and brand of system provided

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 15:05:30 EST 2021

Committee Statement

Committee Statement: Cybersecurity is an aspect of safety and reliability in addition to the other factors

affecting emergency systems and must be addressed in this code. An attack can affect the emergency control system, individual sensors or other IoT devices to the point of either preventing normal operation or displaying the appearance of normal operation while failing the system conditions. Examples of these unsafe conditions include but are not limited to, changing overcurrent protection settings, generator controls, SCADA systems, emergency stop functions, motor controllers, or fire protection systems.

Response Message: FR-8801-NFPA 70-2021

Public Input No. 3080-NFPA 70-2020 [New Section after 700.8]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8802-NFPA 70-2021 [Section No. 700.8]****700.8** Surge Protection.

A listed SPD shall be installed in or on all emergency systems switchgear, switchboards, and panelboards.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 15:12:07 EST 2021

Committee Statement

Committee Statement: This requirement is logically expanded to include surge protection for switchgear in Emergency Systems.

Response Message: FR-8802-NFPA 70-2021

[Public Input No. 4484-NFPA 70-2020 \[Section No. 700.8\]](#)

[Public Input No. 1792-NFPA 70-2020 \[Section No. 700.8\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8803-NFPA 70-2021 [Section No. 700.10(B)]

(B) Wiring.

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 (B)(5)~~ the following :

- (1) Wiring from the normal power source located in transfer equipment enclosures
- (2) Wiring supplied from two sources in exit or emergency luminaires
- (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 within a traveling cable to an elevator
- (6) Wiring from an emergency source to supply emergency and other (nonemergency) loads in accordance with ~~700.10(B)(5)a., (B)(5)b., (B)(5)c., and (B)(5)d. as follows~~ the following :
 - a. Separate vertical switchgear sections or separate vertical switchboard sections, with or without a common bus, or individual disconnects mounted in separate enclosures shall be used to separate emergency loads from all other loads.
 - b. The common bus of separate sections of the switchgear, separate sections of the switchboard, or the individual enclosures shall be either of the following:
 - i. Supplied by single or multiple feeders without overcurrent protection at the source
 - ii. Supplied by single or multiple feeders with overcurrent protection, provided that the overcurrent protection that is common to an emergency system and any nonemergency system(s) is selectively coordinated with the next downstream overcurrent protective device in the nonemergency system(s)

Informational Note: ~~For further information, see~~ See Informational Note Figure 700.10(B)(a) and Informational Note Figure 700.10(B)(b) for further information .

**Figure Informational Note Figure
700.10(B)(a) Single or Multiple Feeders
Without Overcurrent Protection.**

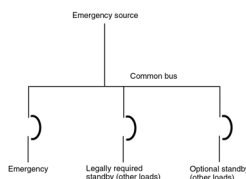
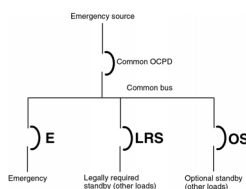


**Figure Informational Note Figure
700.10(B)(b) Single or Multiple Feeders
with Overcurrent Protection.**



- c. Emergency circuits shall not originate from the same vertical switchgear section, vertical switchboard section, panelboard enclosure, or individual disconnect enclosure as other circuits.
- d. It shall be permissible to ~~utilize~~ use single or multiple feeders to supply distribution equipment between an emergency source and the point where the emergency loads are separated from all other loads.

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

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 15:15:54 EST 2021

Committee Statement

Committee Statement: Emergency circuits for lighting in an elevator must be installed in the same traveling cable to an elevator car. This revision recognizes standard industry practice.

Revisions to the informational note are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8803-NFPA 70-2021

Public Input No. 142-NFPA 70-2019 [Section No. 700.10(B)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnolando L.

Spina, Mario C.

Tice, Richard

Affirmative with Comment

Windey, Timothy P.

There is a problem that we need to address in this section. For Gensets with multiple set mounted circuit breakers that are in applications that feed emergency and non-emergency loads, there is significant confusion with 700.10(B)(5). There are four sub-sections (a-d), and people don't know which one(s) to apply to this case. This includes AHJ's. Even code experts are having trouble with this and are coming up with different answers. This is wasting time and money, and causing inconsistencies. We need to add the needed clarity to the code to handle this fairly common genset application by adding a new sub-section (e). Here is my proposed text: (e) At the standby or alternate power source, such as a generator, overcurrent protective devices (OCPD's) supplied directly from the source shall be permitted to supply emergency and non-emergency loads provided that complete separation is provided after the line side connection of the OCPD's. Since this problem and the proposed solution will get public review, this concept is open to a SR and would not be considered new material.



First Revision No. 8805-NFPA 70-2021 [Section No. 700.10(D)(2)]

(2) Feeder-Circuit Wiring.

Feeder-circuit wiring shall meet one of the following conditions:

- (1) The cable or raceway is installed in spaces or areas that are fully protected by an approved automatic fire protection system.
- (2) The cable or raceway is protected by a listed electrical circuit protective system with a minimum 2-hour fire rating.

~~Informational Note No. 1: Electrical circuit protective systems could include but not be limited to thermal barriers or a protective shaft and are tested to UL 1724, *Fire Tests for Electrical Circuit Protection Systems*. See UL 1724, *Fire Tests for Electrical Circuit Protection Systems*, for one method of defining an electrical circuit protective system. The UL *Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information to identify the system and its installation limitations to maintain a minimum 2-hour fire-resistive rating and is available from the certification body.~~

~~Informational Note No. 2: The listing organization provides information for electrical circuit protective systems on proper installation requirements to maintain the fire rating.~~

- (3) The cable or raceway is a listed fire-resistive cable system with a minimum 2-hour fire rating.

~~Informational Note No. 2: Fire-resistive cables are tested to ANSI/UL 2196-2017, *Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*. See UL 2196-2017, *Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, for one method of defining a fire-resistive cable system.~~

~~Informational Note No. 2: The listing organization provides information for fire-resistive cable systems on proper installation requirements to maintain the fire rating.~~

- (4) The cable or raceway is protected by a listed fire-rated assembly that has a minimum fire rating of 2 hours and contains only emergency circuits.
- (5) The cable or raceway is encased in a minimum of 50 mm (2 in.) of concrete.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 15:46:50 EST 2021

Committee Statement

Committee Statement: The informational notes are revised to reflect the proper title of the standards and compliance with the NEC style manual. The reference to ANSI is deleted and the permitted methods to protect the cables are provided in an informational form.

Response Message: FR-8805-NFPA 70-2021

[Public Input No. 2155-NFPA 70-2020 \[Section No. 700.10\(D\)\(2\)\]](#)

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned
16 Affirmative All
3 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Rodriguez, Arnolando L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

Affirmative with Comment

Caron, Daniel J.

Although I agree with FR 8805, I disagree with the Panel action to resolve PI's 1036, 2155 and 3710. The issue of concrete thickness vs. fire rating has been debated in Panel 13 for many cycles prompting the NFPA Research Foundation to conduct a comprehensive study in December 2018. The study was conducted to determine the proper thickness of concrete to achieve a 2-hour fire rating. The study concludes definitively that 2 inches of concrete, regardless of the type of concrete used, DOES NOT achieve a 2-hour fire rating. Although different types of concrete achieve a 2-hour fire rating at different thicknesses, and the study concluded that 5 inches of any type of concrete do achieve the required fire rating, this Panel should not simply resolve the PI's because it thinks a thickness of 5" is onerous. This Panel should have created a first revision, with performance criteria, using language such as; "The cable or raceway is encased in concrete with a thickness sufficient to achieve a 2-hour fire rating."; and a Fine Print Note referencing the NFPA Research Foundation report.

Conrad, James S.

I agree with the action on FR-8805 which addressed PI 2155 for section 700.10(D)(2) or more specifically 700.10(D)(2)(2) - electrical circuit protective system and 700.10(D)(2)(2) – fire resistive cables system. Section 700.10(D) is titled Fire Protection and 700.10(D)(2)(1) through (4) requires 2-hours protection as well as 700.12(B). Section 700.12(B) requires the equipment be installed in a room that is fully protected by

a fully automated fire protection system or in a space with a 2-hour fire rating. Notice that there is no construction requirement for how to construct the room. This is left up to the designer and contractor to meet the 2-hour requirements. However, CMP-13 resolved PI 3710 for section 700.10(D)(2)(5), which allows 2 inches of concrete encasement. Part of the committee statement for PI 3710 states "It is understood that 2-inches of concrete may not equal a 2-hour fire rating. The engineer must determine the fire rating based on many factors including the mix or aggregate of concrete." CMP-13 needs to make sure all the methods meet the 2-hour requirements and needs to revisit this section during the second draft meeting.

Neeser, Daniel R.

The Guide Info (FHIT) is specific to one NRTL and may need to be removed. In addition, "and is available from the certification body" should be deleted as it could create confusion.



First Revision No. 8807-NFPA 70-2021 [Section No. 700.10(D)(4)]

(4) Generator Source Control Wiring.

Control conductors installed between the EPSS/SEPSS and transfer equipment ~~and the emergency generator~~ or control systems that initiate the operation of emergency sources or initiate the automatic connection to emergency loads shall be kept entirely independent of all other wiring and shall meet the conditions of 700.10(D)(2). The integrity of ~~the generator remote start circuit~~ source control wiring shall be monitored for broken, disconnected, or shorted wires. Loss of integrity shall ~~start the generator(s).~~ result in the following actions:

- (1) Generators . Shall start the generator(s).
- (2) All other sources . Shall be considered a system malfunction and initiate the designated signal(s) in 700.6(A).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 16:05:04 EST 2021

Committee Statement

Committee Statement: The requirements of 700.10(D)(4) have been revised to provide clarity that the control conductors from all approved emergency power sources have to meet the requirements of 700.10(D)(2) and be kept entirely independent of all other wiring. The loss of integrity of the control wiring for all emergency power sources shall also be monitored for any malfunctions, and losses in integrity should signal a system malfunction and start the associated emergency source.

Response Message: FR-8807-NFPA 70-2021

Public Input No. 2801-NFPA 70-2020 [Section No. 700.10(D)(4)]

Public Input No. 3507-NFPA 70-2020 [Section No. 700.10(D)(4)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

This is an important addition, and similar changes will be required at other locations throughout the NEC. The increasing number of emergency systems supplied by standby sources other than a generator needs to be acknowledged in the code. This type of effort to keep the NEC current is vital.

**First Revision No. 8820-NFPA 70-2021 [Section No. 700.12(B)]****(B) Equipment Design and Location.**

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

Equipment for sources of power as described in 700.12(C) through (H) shall be installed either in spaces fully protected by approved automatic fire protection systems or in spaces with a 2-hour fire rating where located within the following:

- (1) Assembly occupancies for more than 1000 persons
- (2) Buildings above 23 m (75 ft) in height ~~with any of the following occupancy classes — assembly, educational, residential, detention and correctional, business, and mercantile~~
- (3) Educational occupancies with more than 300 occupants

Informational Note No. 1: ~~For See NFPA 101 -2021, *Life Safety Code*, for the definition of Occupancy Classification, see Section 6.1 of NFPA 101 -2018, *Life Safety Code*.~~

Informational Note No. 2: ~~For information regarding power system reliability, see See IEEE 3006.5-2014, *Recommended Practice for the Use of Probability Methods for Conducting a Reliability Analysis of Industrial and Commercial Power Systems*, for information regarding power system reliability.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 17:22:34 EST 2021

Committee Statement

Committee Statement: This revision provides correlation with the requirements in 700.10(D)(1)(2). Revisions to the informational notes are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8820-NFPA 70-2021

Public Input No. 4489-NFPA 70-2020 [Section No. 700.12(B)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8843-NFPA 70-2021 [Sections 700.12(C), 700.12(D)]

(C) Storage-Battery Supply Duration .

~~Storage batteries shall be of suitable rating and capacity to supply and maintain the total load for a minimum period of 1 ½ hours, without the voltage applied to the load falling below 87 ½ percent of normal. Automotive-type batteries shall not be used.~~ The emergency power source shall be of suitable rating and capacity to supply and maintain the total load for the duration determined by the system design. In no case shall the duration be less than 2 hours of system operation unless used for emergency illumination in 700.12(C)(4) or unit equipment in 700.12(I). Additionally, the power source shall comply with 700.12(C)(1) through (C)(5) as applicable .

~~An automatic battery charging means shall be provided.~~

(1) On-Site Fuel Supply.

~~Where internal combustion engines are used as the prime mover, an~~ An on-site fuel supply shall be provided, ~~with an on-premises fuel supply~~ sufficient for not less than 2 hours' operation of the system.

(2) Fuel Transfer Pumps.

~~Where power is needed for the operation of the fuel transfer pumps to deliver fuel to a generator set day tank, this pump~~ the source, these pumps shall be connected to the emergency power system.

(3) Public Gas System, Municipal Water Supply.

~~Prime movers~~ Sources shall not be solely dependent on a public utility gas system for their fuel supply or municipal water supply for their cooling systems.

Exception: Where approved by the authority having jurisdiction, the use of other than on-site fuels shall be permitted where there is a low probability of a simultaneous failure of both the off-site fuel delivery system and power from the outside electrical utility company. Where the public gas system is approved, the requirements of 700.12(C)(1) shall not apply.

(4) Storage Batteries and UPS.

Storage batteries and uninterruptable power supply systems used to supply emergency illumination shall be of suitable rating and capacity to supply and maintain the total load for a minimum period of 1½ hours, without the voltage applied to the load falling below 87½ percent of ~~normal~~ nominal voltage . Automotive-type batteries shall not be used. An automatic battery charging means shall be provided.

(5) Automatic Fuel Transfer

Where dual fuel ~~supplies~~ sources are used, means shall be provided for automatically transferring from one fuel ~~supply~~ source to another.

(D) Generator Set.

[Detail FR-8844](#)

(1) Prime Mover-Driven.

For a generator set driven by a prime mover approved by the authority having jurisdiction and sized in accordance with 700.4, means shall be provided for automatically starting the prime mover on failure of the normal ~~service~~ power source and for automatic transfer and operation of all required electrical circuits. A time-delay feature shall be provided to avoid retransfer in case of short-time reestablishment of the normal source.

~~(2) Internal Combustion Engines as Prime Movers.~~

~~(0) *On-Site Fuel Supply.* Where internal combustion engines are used as the prime mover, an on-site fuel supply shall be provided with an on-premises fuel supply sufficient for not less than 2 hours' operation of the system.~~

~~(0) *Fuel Transfer Pumps.* Where power is needed for the operation of the fuel transfer pumps to deliver fuel to a generator set day tank, this pump shall be connected to the emergency power system.~~

~~(0) *Public Gas System, Municipal Water Supply.* Prime movers shall not be solely dependent on a public utility gas system for their fuel supply or municipal water supply for their cooling systems.~~

~~*Exception: Where approved by the authority having jurisdiction, the use of other than on-site fuels shall be permitted where there is a low probability of a simultaneous failure of both the off-site fuel delivery system and power from the outside electrical utility company.*~~

~~(0) *Automatic Fuel Transfer.* Where dual fuel supplies are used, means shall be provided for automatically transferring from one fuel supply to another.~~

(2) Battery Power and Dampers.

Where a storage battery is used for control or signal power or as the means of starting the prime mover, it shall be suitable for the purpose and shall be equipped with an automatic charging means independent of the generator set. Where the battery charger is required for the operation of the generator set, it shall be connected to the emergency system. Where power is required for the operation of dampers used to ventilate the generator set, the dampers shall be connected to the emergency system.

(3) Auxiliary Power Supply.

Generator sets that require more than 10 seconds to develop power shall be permitted if an auxiliary power supply energizes the emergency system until the generator can pick up the load.

(4) Outdoor Generator Sets.

Where an outdoor-housed generator set is equipped with a readily accessible disconnecting means in accordance with 445.18, and the disconnecting means is located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors serve or pass through the building or structure. Where the generator supply conductors terminate at a disconnecting means in or on a building or structure, the disconnecting means shall meet the requirements of 225.36.

Exception: For installations under single management, where conditions of maintenance and supervision ensure that only qualified persons will monitor and service the installation and where documented safe switching procedures are established and maintained for disconnection, the generator set disconnecting means shall not be required to be located within sight of the building or structure served.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_P13_FR8843_700.12_C_D_attachment.docx	NEC_P13_FR8843_700.12_C_D_attachment. For staff use	

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Tue Jan 12 11:12:30 EST 2021

Committee Statement

Committee The requirements in 700.12(D)(2) are moved to 700.12(C) to correlate with a revision to that

Statement: section. The requirements apply to more than just generator sources and this action moves them into a common requirement section. A new last sentence is added in the exception to 700.12(C)(3) to permit, where approved, a public gas system need not comply with 700.12(C)(1).

The existing requirements of 700.12(C) for storage batteries are being moved to 700.12(C)(4) with this revision.

The title was revised in order to have a common section for the emergency source duration required regardless of the source type(s). Additionally, the fuel supply, storage, and transfer pump requirements included are moved from 700.12(D)(2) since these should apply to any applicable sources and not just generators. Editorial revisions are made to existing text for clarity. 700.12(C)(1) revisions have been made for clarity.

Response Message: FR-8843-NFPA 70-2021

[Public Input No. 4165-NFPA 70-2020 \[Section No. 700.12\(D\)\(2\)\]](#)

[Public Input No. 2802-NFPA 70-2020 \[Section No. 700.12\(C\)\]](#)

[Public Input No. 2803-NFPA 70-2020 \[Section No. 700.12\(D\)\(2\)\]](#)

[Public Input No. 1038-NFPA 70-2020 \[Section No. 700.12\(D\)\(2\)\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8827-NFPA 70-2021 [Section No. 700.12(E)]****(E) Uninterruptible Power Supplies Stored-Energy Power Supply Systems (SEPSS) .**

Uninterruptible power supplies used to provide power for emergency systems shall comply with the applicable provisions of 700.12(B) and (C) Stored energy power supply systems shall comply with 700.12(E)(1) and (E)(2) .

(1) Types.

Systems shall consist of one or more of the following system types:

(1) Uninterruptible power supply (UPS)

Informational Note: See UL 1778, *Uninterruptible Power Systems* , for further information.

(2) Fuel cell system**(3) Energy storage system (ESS)****(4) Storage battery****(5) Other approved equivalent stored energy sources that comply with 700.12****(2) Fire Protection, Suppression, Ventilation, and Separation.**

The systems in 700.12(E)(1) shall be installed with the fire protection, suppression, ventilation, and separation requirements specified in the manufacturer's instructions or equipment listing.

Informational Note: See NFPA 853 -2020, *Standard for the Installation of Stationary Fuel Cell Power Systems*, and NFPA 855 -2020, *Standard for the Installation of Stationary Energy Storage Systems*, for additional information on fire protection installation requirements.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 11 17:44:53 EST 2021

Committee Statement

Committee Statement: These changes are intended to expand what can be utilized for the newly defined stored-energy power supply systems (SEPSS) to include a number of different technologies that are currently available and can be used for this application including UPS, fuel cell systems, ESS, storage batteries for DC loads and an "other" option since these technologies may not represent an all-inclusive list.

Response Message: FR-8827-NFPA 70-2021

Public Input No. 2804-NFPA 70-2020 [Section No. 700.12(E)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9194-NFPA 70-2021 [Section No. 700.12(G)]****~~(G) Fuel Cell System.~~**

~~Fuel cell systems used as a source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.~~

~~Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692.~~

~~Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the emergency standby system.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Sun Jan 17 12:01:57 EST 2021

Committee Statement

Committee Statement: The requirements in 700.12(G) for fuel cell systems are moved into the revised 700.12(E) (see action taken on PI-2804) for stored energy power supply systems.

Response Message: FR-9194-NFPA 70-2021

[Public Input No. 2806-NFPA 70-2020 \[Section No. 700.12\(G\)\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 9195-NFPA 70-2021 [Section No. 700.12(H)]****(G) DC Microgrid Systems.**

~~Sources connected to a dc microgrid system shall be permitted where the system is capable of being isolated from all non-emergency sources~~ On-site sources, designated as emergency sources, shall be permitted to be connected to a microgrid system .

~~DC microgrid systems used as a source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total emergency load for not less than 2 hours of full-demand operation~~ The system shall isolate the emergency system from all nonemergency loads when the normal electric supply is interrupted or shall meet the requirements of 700.4(C). Interruption or partial or complete failure of the normal or nonemergency source(s) shall not impact the availability, capacity, and duration provided by the designated emergency sources .

~~Where a dc microgrid system source serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the emergency standby system~~ The designated stored-energy electrical emergency power source(s) of a microgrid system shall be permitted to remain interconnected to any available power production source during operation of the emergency source(s) where the lack of, or failure of, the interconnected power production source(s), or related controls, does not impact system operation. Interconnected power production sources, other than the designated stored emergency power source(s), shall not be required to meet the requirements of Article 700 .

Submitter Information Verification

Committee: NEC-P13

Submission Date: Sun Jan 17 12:05:05 EST 2021

Committee Statement

Committee Statement: This first level subdivision is modified to recognize that there are different types of microgrids, in addition to any that might be categorized as dc only. The first sentence is similar to the 2020 language but modified to include other microgrid configurations. New second sentence clarifies that, similar to optional standby systems, non-emergency loads are permitted to be supplied by the emergency sources within the microgrid but these shall be isolated from the emergency sources during emergency operation, or shall be controlled per 700.4(C).

Language to address the condition where there is a failure of one or more interconnected sources not categorized as emergency sources is addressed in the third sentence. Failures with emergency sources require a malfunction signal in 700.6 however other sources are not included so this language has been added. This language would require that an evaluation of these conditions is considered in the installation of such a system.

The final paragraph provides an allowance that where a stored-energy emergency source, such as a battery or ESS, is used as part of the emergency power system, it shall be permitted to be charged by other sources, not just those categorized as emergency sources. This is not a blanket allowance however, since an evaluation must be performed to ensure that the lack of any of these sources, or any failure within them, will not impact the ability of the emergency system to supply the emergency loads.

Response Message: FR-9195-NFPA 70-2021

Public Input No. 2808-NFPA 70-2020 [Section No. 700.12(H)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8848-NFPA 70-2021 [Section No. 700.12(I)]****(H) Unit Equipment Battery-Equipped Emergency Luminaires .****(1) Components of Unit Equipment Listing .**

Individual unit equipment for emergency illumination shall consist of the following: All battery-equipped emergency luminaires shall be listed.

(0) ~~A rechargeable battery~~

(0) ~~A battery charging means~~

(0) ~~Provisions for one or more lamps mounted on the equipment, or shall be permitted to have terminals for remote lamps, or both~~

(0) ~~A relaying device arranged to energize the lamps automatically upon failure of the supply to the unit equipment~~

Informational Note No. 1: See ANSI/UL 924, *Emergency Lighting and Power Equipment* , for the requirements covering battery-equipped emergency luminaires and emergency battery packs. A listed emergency battery pack installed in a listed luminaire will provide similar functionality as a listed battery-equipped emergency luminaire.

Informational Note No. 2: Unit equipment is a type of battery-equipped emergency luminaire.

(2) Installation of Unit Equipment .

~~Unit equipment~~ Battery-equipped emergency luminaires shall be installed in accordance with the following:

- (0) ~~The batteries shall be of suitable rating and capacity to supply and maintain the total lamp load associated with the unit in accordance with the following:~~
0. ~~For a period of at least 1 1/2 hours without the voltage falling below 87 1/2 percent of normal battery voltage.~~
 0. ~~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.~~
- (1) Battery-equipped emergency luminaires shall be permanently fixed in place (i.e., not portable).
- (2) Unit equipment shall be permanently fixed (i.e., not portable) in place and shall have all wiring to each unit installed in accordance with the requirements of any of the wiring methods in Chapter 3 ~~Wiring to each luminaire shall be installed in accordance with the requirements of any of the wiring methods in Chapter 3 unless otherwise specified in Part II, IV, or V of this article . Flexible cord-and-plug connection shall be permitted, provided that the cord does not exceed 900 mm (3 ft) in length. Flexible cord, with or without a plug, provided that the cord does not exceed 1800 mm (6 ft) in length, shall also be permitted for battery-equipped emergency luminaires installed in accordance with 410.62(C)(1).~~
- (3) The branch circuit feeding the unit equipment battery-equipped emergency luminaire shall be one of the following:
- a. The same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches.
 - b. The same or a different branch circuit as that serving the normal lighting in the area if that circuit is equipped with means to monitor the status of that area's normal lighting branch circuit ahead of any local switches.
 - c. Where the normal lighting circuit is served by one or more branch circuits, a separate branch circuit, provided with a lock-on feature, that originates from the same panelboard as the normal lighting circuits. The branch circuit disconnecting means for this branch circuit shall be provided with a lock-on feature.
- (4) The branch circuit that feeds unit equipment battery-equipped emergency luminaires shall be clearly identified at the distribution panel.
- (5) Emergency luminaires that obtain power from a unit equipment and are not part of the unit equipment battery-equipped emergency luminaire shall be wired to the unit equipment battery-equipped emergency luminaires as required by 700.10 and by one of the wiring methods of Chapter 3 in Part II, IV, or V of this article .
- (6) Remote heads luminaires providing lighting for the exterior of an exit door shall be permitted to be supplied by the unit equipment battery-equipped emergency luminaire serving the area immediately inside the exit door.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_P13_FR8848_Section_700.12_I_attachment.docx	For Staff Use - NEC_P13_FR8848_Section_700.12_I_attachment	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 11:32:53 EST 2021

Committee Statement

Committee Statement: The NEC has long been silent on Battery Equipped Emergency Luminaires, which are now in common use. This revision recognizes this equipment. This revision removes construction and performance requirements for Battery Equipped Emergency Luminaires, which is properly covered by their listing under UL924.

See also definitions added in response for PI 2203.

A new IN No. 2 is added to provide clarity by explaining that unit equipment is a type of battery-equipped emergency luminaire.

Response Message: FR-8848-NFPA 70-2021

[Public Input No. 2204-NFPA 70-2020 \[Section No. 700.12\(I\)\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

The additional language in subsection (2) item (3) could cause confusion. A change to indicate that a branch circuit serving normal lighting does not need to be equipped with means to monitor the status of itself is warranted. Simply changing this requirement to only apply to a circuit different from the branch circuit serving normal lighting would clear this up.

**First Revision No. 8852-NFPA 70-2021 [Section No. 700.16(B)]****(B) System Reliability.**

Emergency lighting systems shall be designed and installed so that the failure of any illumination source cannot leave in total darkness any space that requires emergency illumination.

Control Emergency lighting control devices in the emergency lighting system shall be listed for use in emergency systems. Listed unit equipment in accordance with 700.12(H) shall be considered as meeting the provisions of this section.

Informational Note: See 700.23 through 700.26 ~~provide requirements~~ for applications of emergency system control devices.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 12:18:13 EST 2021

Committee Statement

Committee Statement: This revision provides usability by clarifying that the “control devices” are “emergency lighting” control devices now defined in Article 100.

Revisions to the informational note are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8852-NFPA 70-2021

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Neeser, Daniel R.

The information note should use the same term as the parent text. Revise "emergency system control devices" to "emergency lighting control devices".

**First Revision No. 8853-NFPA 70-2021 [Section No. 700.17]****700.17 Branch Circuits for Emergency Lighting.**

Branch circuits that supply emergency lighting shall be installed to provide service from a source complying with 700.12 when the normal supply for lighting is interrupted. Such installations shall provide either of the following:

- (1) An emergency lighting supply, independent of the normal lighting supply, with provisions for automatically transferring the emergency lights upon the event of failure of the normal lighting branch-circuit supply.
- (2) Two or more branch circuits supplied from separate and complete systems with independent power sources. One of the two power sources and systems shall be part of the emergency system, and the other shall be permitted to be part of the normal power source and system. Each system shall provide sufficient power for emergency lighting purposes.

Unless both systems are used for regular lighting purposes and both are ~~both~~ kept lighted, means shall be provided for automatically energizing either system upon failure of the other. Either system or both systems shall be permitted to be a part of the general lighting of the protected occupancy if circuits supplying lights for emergency illumination are installed in accordance with other sections of this article.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 12:24:16 EST 2021

Committee Statement

Committee Statement: This revision clarifies that it is acceptable to monitor the normal supply in a given area rather than each individual branch circuit for that area.

Response Message: FR-8853-NFPA 70-2021

Public Input No. 671-NFPA 70-2020 [Section No. 700.17]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8855-NFPA 70-2021 [Section No. 700.18]

700.18 Circuits for Emergency Power.

For branch circuits that supply equipment classed as emergency, there shall be an emergency system supply source to which the load will be transferred automatically upon the failure of the normal supply.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 12:26:09 EST 2021

Committee Statement

Committee Statement: This revision adds the word “system” since emergency system is a defined term.

Response Message: FR-8855-NFPA 70-2021

Public Input No. 4161-NFPA 70-2020 [Section No. 700.18]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9141-NFPA 70-2021 [Section No. 700.23]****700.23 Dimmer and Relay Systems.**

A dimmer or relay system containing more than one dimmer or relay and listed for use in emergency systems shall be permitted to be used as a control device for energizing emergency lighting circuits. Upon failure of normal power, the dimmer or relay system shall be permitted to selectively energize only those branch circuits required to provide minimum emergency illumination using a control bypass function. Where the dimmer or relay system is fed by a normal/emergency source from an upstream transfer switch, normal power sensing for this function shall be permitted to be from a normal-only power source upstream of the transfer switch. All branch circuits supplied by the dimmer or relay system cabinet shall comply with the wiring methods of [Part II of Article 700](#).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 14:32:43 EST 2021

Committee Statement

Committee Statement: CMP-13 has revised the reference to Article 700 to align with 4.1.1 of the NEC® Style Manual.

Response Message: FR-9141-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

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Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8857-NFPA 70-2021 [Section No. 700.24]****700.24** Directly Controlled Emergency Luminaires.

Where emergency illumination is provided by one or more directly controlled emergency luminaires that, upon loss of normal power, respond to an external control input, ~~or loss thereof, to bypass normal control upon loss of normal power, such luminaires and external bypass controls shall be individually~~ to establish the required emergency illumination level, such directly controlled emergency luminaires shall be listed for use in emergency systems. Luminaires that are energized to the required emergency illumination level by disconnection of their control input by a listed emergency lighting control device shall not be required to be listed for use in emergency systems.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 12:32:17 EST 2021

Committee Statement

Committee Statement: This section was modified to acknowledge that a directly controlled luminaire can be energized to an emergency lighting level in two ways, each of which dictates a different listing requirement for the luminaire itself:

1. By an active control signal from a listed external control system, which also requires the luminaire itself to be listed as a directly controlled emergency luminaire.
2. By disconnection of the luminaire's control input by a listed emergency lighting control device such as an automatic load control relay. In this case, the luminaire itself does not require listing as a directly controlled emergency luminaire.

This revised wording acknowledges common safe industry practice for disconnection of control inputs upon loss of normal power while maintaining the need for emergency listing of the luminaire if an active control signal of any kind is used to drive the luminaire to an emergency lighting level.

Response Message: FR-8857-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
3 Not Returned
19 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

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Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8856-NFPA 70-2021 [New Section after 700.26]

700.27 Class 2 Powered Emergency Lighting Systems.

Devices that combine control signals with Class 2 emergency power on a single circuit shall be listed as emergency lighting control devices.

Informational Note: An example of a device combining control signals with Class 2 emergency power sources is a Power over Ethernet (PoE) switch.

Submitter Information Verification

Committee: NEC-P13

Submission Date: Tue Jan 12 12:28:53 EST 2021

Committee Statement

Committee Statement: The UL924 standard makes it clear that a PoE switch or similar device that combines control and class 2 power on a single circuit qualifies as an Emergency Lighting Control Device (ELCD). 700.16(B) mandates that control devices in the emergency system must be listed for use in emergency systems. However, since most users of the NEC do not have access to the details of UL924, explicit clarification is needed in article 700 to make clear that devices combining control and class 2 power on a single circuit in emergency systems (PoE switches, as one example cited in the informational note) qualify as emergency lighting control devices thus requiring listing for use in emergency systems.

Response Message: FR-8856-NFPA 70-2021

Public Input No. 2851-NFPA 70-2020 [New Section after 700.26]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9113-NFPA 70-2021 [Section No. 700.32]

700.32 Selective Coordination.

~~Emergency system(s) overcurrent devices shall be selectively coordinated with all supply-side overcurrent protective devices.~~

~~Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.~~

~~*Exception:- Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.*~~

~~Informational Note: See Informational Note Figure 700.32 for an example of how emergency system overcurrent protective devices (OCPDs) selectively coordinate with all supply-side OCPDs.~~

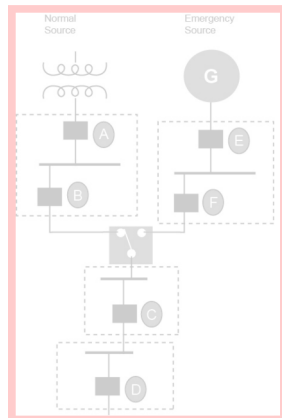
~~OCPD D selectively coordinates with OCPDs C, F, E, B, and A.~~

~~OCPD C selectively coordinates with OCPDs F, E, B, and A.~~

~~OCPD F selectively coordinates with OCPD E.~~

~~OCPD B is not required to selectively coordinate with OCPD A because OCPD B is not an emergency system OCPD.~~

**Figure Informational Note Figure
700.32 Emergency System Selective
Coordination.**



(A) General.

~~Emergency system(s) overcurrent protective devices (OCPDs) shall be selectively coordinated with all supply-side overcurrent protective devices and load-side OCPDs .~~

~~Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.~~

(B) Replacements.

~~Where emergency system(s) OCPDs are replaced, they shall be reevaluated to ensure selective coordination is maintained with all supply-side and load-side OCPDs.~~

(C) Modifications.

Where modifications, additions, or deletions to the emergency system(s) occur, selective coordination of the emergency system(s) OCPDs with all supply-side and load-side OCPDs shall be reevaluated.

Exception: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.

Informational Note: See Informational Note Figure 700.32 for an example of how emergency system overcurrent protective devices (OCPDs) selectively coordinate with all supply-side OCPDs.

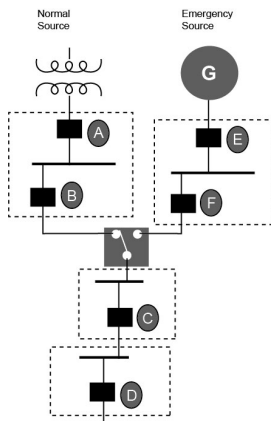
OCPD D selectively coordinates with OCPDs C, F, E, B, and A.

OCPD C selectively coordinates with OCPDs F, E, B, and A.

OCPD F selectively coordinates with OCPD E.

OCPD B is not required to selectively coordinate with OCPD A because OCPD B is not an emergency system OCPD.

**Figure Informational Note Figure
700.32 Emergency System Selective
Coordination.**



Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 08:32:29 EST 2021

Committee Statement

Committee Statement: The parent text is modified for clarity with respect to overcurrent protective devices (OCPD's) and the words "load-side" are added in (A), (B), and (C) to clarify that selective coordination must be analyzed both upstream and downstream.

This revision clarifies existing requirements where emergency standby system OCPD's are replaced, modified, added or deleted. This is done to ensure that selective coordination with all supply-side and load-side OCPD's is maintained.

Response Message: FR-9113-NFPA 70-2021

[Public Input No. 3372-NFPA 70-2020 \[Section No. 700.32\]](#)

Ballot Results

✓ This item has passed ballot

22 Eligible Voters
3 Not Returned
19 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9623-NFPA 70-2021 [Section No. 701.1]

701.1 Scope.

This article applies to the electrical safety of the installation, operation, and maintenance of legally required standby systems consisting of circuits and 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.

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

Informational Note No. 1: ~~For further information, see~~ See NFPA 99-2018, *Health Care Facilities Code*, for further information .

Informational Note No. 2: ~~For further information regarding performance of emergency and standby power systems, see~~ See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for further information regarding performance of emergency and standby power systems .

Informational Note No. 3: ~~For further information, see~~ See ANSI/IEEE 446-1995, *Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications*, for further information .

Informational Note No. 4: Legally required standby systems are typically installed to serve loads, such as heating and refrigeration systems, communications systems, ventilation and smoke removal systems, sewage disposal systems, lighting systems, and industrial processes that, when stopped during any interruption of the normal electrical supply, could create hazards or hamper rescue or firefighting operations.

Informational Note No. 5: Legally required standby systems are considered level one systems when failure to perform could result in loss of human life or serious injuries and level two systems when failure of legally required standby systems to perform is less critical to human life and safety when applying NFPA 110 -2019, *Standard for Emergency Standby Power Systems* .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Feb 02 07:19:37 EST 2021

Committee Statement

Committee Statement:	This revision adds a new Informational Note No. 5. This is necessary to correlate levels
	defined in NFPA 110 to the systems used in the NEC. This will aid in the interaction of these
	standards. This IN also provides guidance as to which legally required standby systems are
	considered level 1 due to their critical nature tied to loss of life or serious injury versus the
	level 2 that is less critical. Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the
	NEC Style Manual and to correlate with 700.1.

The existing info note following the definition of legally required standby systems is relocated

to follow the scope of Article 701 because the def has been moved to Article 100. Also see FR-9624.

Response Message: FR-9623-NFPA 70-2021

Public Input No. 4177-NFPA 70-2020 [Definition: Legally Required Standby Systems.]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9624-NFPA 70-2021 [Definition: Legally Required Standby Systems.]

Legally Required Standby Systems.

Those systems required and so classed as legally required standby by municipal, state, federal, or other codes or by any 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. (CMP-13)

~~Informational Note: Legally required standby systems are typically installed to serve loads, such as heating and refrigeration systems, communications 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.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Feb 02 07:27:56 EST 2021

Committee Statement

Committee Statement: All definitions have been moved to Article 100. This informational note has been moved to 701.1 so that it remains in Article 701. See FR-9623.

Response Message: FR-9624-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 8867-NFPA 70-2021 [Section No. 701.3]****701.3 Tests Commissioning and Maintenance.****(A) Conduct Commissioning or Witness Test.**

The authority having jurisdiction shall conduct or witness ~~a test~~ the commissioning and testing of the complete system upon installation.

(B) Tested Periodically.

Systems shall be tested periodically on a schedule and in a manner approved by the authority having jurisdiction to ensure the systems are maintained in proper operating condition.

(C) Maintenance.

Legally required standby system equipment shall be maintained in accordance with manufacturer instructions and industry standards.

(D) Written Record.

A written record shall be kept on such tests and maintenance.

Detail FR-8868

(E) Testing Under Load.

Means for testing legally required standby systems under load shall be provided.

Informational Note: ~~For See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for information on testing and maintenance of emergency power supply systems (EPSSs), see NFPA 110-2019, *Standard for Emergency and Standby Power Systems*.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 13:06:00 EST 2021

Committee Statement

Committee Statement: Revisions are made to clarify that the legally required standby system must be commissioned prior to being placed into active service.

Response Message: FR-8867-NFPA 70-2021

Public Input No. 2882-NFPA 70-2020 [Section No. 701.3]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

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Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8869-NFPA 70-2021 [Section No. 701.4(B)]****(B) Capacity.**

A legally required standby system shall have adequate capacity in accordance with Article 220 or by another approved method. The system capacity shall be sufficient for the rapid load changes and transient power and energy requirements associated with any expected loads.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 13:15:30 EST 2021

Committee Statement

Committee Statement: The addition of this new language addresses the common condition where facilities relying on legally required standby systems have variable loads that can also have significant transient high-power conditions such as motor starting. This language makes it clear that these conditions must be taken into account when sizing the minimum capacity of these systems.

Response Message: FR-8869-NFPA 70-2021

Public Input No. 2815-NFPA 70-2020 [Section No. 701.4(B)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 8874-NFPA 70-2021 [New Section after 701.4(C)]

(D)_ Parallel Operation.

Parallel operation shall comply with Part I or Part II of Article 705 where the legally required source capacity required to supply the legally required load is maintained at all times. Parallel operation of the legally required source(s) shall consist of the sources specified in 701.4(D)(1) and (D)(2).

(1)_ Normal Source.

The alternate power source shall be permitted to operate in parallel with the normal source in compliance with Part I or Part II of Article 705 where the capacity required to supply the legally required standby load is maintained at all times. Any operating condition that results in less than the required source capacity shall initiate a legally required standby source malfunction signal in 701.6(A).

Parallel operation shall be permitted for satisfying the test requirements of 701.3(B), provided all other conditions of 701.3 are met.

Informational Note: Peak load shaving is one application for parallel source operation.

(2)_ Alternate Source.

Legally required standby sources shall be permitted to operate in parallel where the necessary equipment to establish and maintain a synchronous condition is provided.

Submitter Information Verification

Committee: NEC-P13

Submission Date: Tue Jan 12 13:43:58 EST 2021

Committee Statement

Committee Statement: This new first level subdivision clarifies that there are two distinctly different types of parallel operation. 701.4(D)(1) identifies requirements specific to applications where legally required standby source(s) operate in parallel with a normal source whereas 701.4(D)(2) identifies requirements for conditions where alternate sources operate in parallel only with each other.

Some systems may utilize both conditions, so the charging sentence allows both to be applied. For applications where an alternate source is used in parallel with a normal source, a statement that the required capacity to supply the legally required standby load be maintained at all times is included.

To clarify these applications further with regards to other sections in article 701, a reference to 701.6(A) is included to ensure that any reduction in the minimum capacity trigger a malfunction signal. Since systems that operate in parallel with a normal source are generally always functioning, a recognition that this operation meets the requirements for periodic testing is also included.

All other requirements in 701.3 continue to apply so that is made clear in this new language. The sentences struck from previous 701.4(C) have been moved here (modified) into 701.4(D)(1). A reference to article 705 has been added to point users to this article where requirements for interconnected sources are located.

The addition of 701.4(D)(2) clarifies that alternate sources can be paralleled together provided they are suitable for this application. This was not prohibited before, but it is important to state this here to distinguish between sources operated in parallel with each other and those that operate in parallel with a normal source.

Response FR-8874-NFPA 70-2021
Message:

[Public Input No. 2818-NFPA 70-2020 \[New Section after 701.4\(C\)\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters
3 Not Returned
19 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 8875-NFPA 70-2021 [Section No. 701.4(C)]****(C) Load Pickup, and Load Shedding, and ~~Peak Load Shaving~~.**

The alternate power source shall be permitted to supply legally required standby and optional standby system loads where the alternate source has adequate capacity or where automatic selective load pickup and load shedding are provided that will ensure adequate power to the legally required standby circuits.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 13:50:20 EST 2021

Committee Statement

Committee Statement: This action removes "peak load shaving" from the title since the requirements for parallel sources are addressed in a proposed new section 701.4(D) titled "Parallel Operation". The application of peak load shaving is just one-use case for these systems while operating in parallel with the normal source.

Response Message: FR-8875-NFPA 70-2021

Public Input No. 2816-NFPA 70-2020 [Section No. 701.4(C)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Caron, Daniel J.

701.4(C) should be modified to be consistent with 700.4(C). 701.4(C) does not reference "Emergency Systems". A generator serving Legally Required loads can also serve Emergency Loads, and the order of priority should be (re)stated.

**First Revision No. 8876-NFPA 70-2021 [Section No. 701.5(A)]****(A) General.**

Transfer equipment shall be automatic, listed, and marked for emergency system or legally required standby use, ~~and approved by the authority having jurisdiction~~ . Transfer equipment shall be designed and installed to prevent the inadvertent interconnection of normal and alternate sources of supply in any operation of the transfer equipment. Transfer equipment and electric power production systems installed to permit operation in parallel with the normal source shall meet the requirements of Article 705. Meter-mounted transfer switches shall not be permitted for legally required system use.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 13:55:20 EST 2021

Committee Statement

Committee Statement: The text “and approved by the AHJ” is deleted as it is redundant.

Response Message: FR-8876-NFPA 70-2021

Public Input No. 574-NFPA 70-2020 [Section No. 701.5(A)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8877-NFPA 70-2021 [Section No. 701.6(C)]

(C) Not-Functioning Battery Charging Malfunction .

To indicate that the ~~battery charger is not functioning charging malfunction~~ on a battery required for source readiness, including the prime mover starting battery .

Informational Note: ~~For signals for generator sets, see~~ See NFPA 110-2016 2019 , *Standard for Emergency and Standby Power Systems, for signals for generator sets* .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 14:00:09 EST 2021

Committee Statement

Committee Statement: The title of this section is revised to better describe the functional area of the alarm signal. Additionally, the requirement was changed to align with the focus on battery charging and potential impact to source readiness.

Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8877-NFPA 70-2021

Public Input No. 2819-NFPA 70-2020 [Section No. 701.6(C)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

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Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8878-NFPA 70-2021 [Section No. 701.6(D)]****(D) Ground Fault.**

To indicate a ground fault in solidly grounded wye, legally required standby systems of more than 150 volts to ground and circuit-protective devices rated 1000 amperes or more. The sensor for the ground-fault signal devices shall be located at, or ahead of, the main system disconnecting means for the legally required standby source, and the maximum setting of the signal devices shall be for a ground-fault current of 1200 amperes. Instructions on the course of action to be taken in the event of an indicated ground fault shall be located at or near the sensor location.

For systems with multiple emergency sources connected to a paralleling bus, the ground fault sensor shall be permitted at an alternate location.

Informational Note: ~~For signals for generator sets, see~~ See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for signals for generator sets.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 14:03:54 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8878-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8880-NFPA 70-2021 [New Section after 701.7(B)]****701.9 Cybersecurity.**

Legally required systems that are connected to a communication network and have the capability to permit control of any portion of the premises legally required electrical system shall comply with either of the following:

- (1) The ability to control the system is limited to a direct connection through a local nonnetworked interface.
- (2) It is connected through a networked interface complying with one of the following methods:
 - a. The system and associated software are identified as being evaluated for cybersecurity.
 - b. A cybersecurity assessment is conducted on the connected system to determine vulnerabilities to cyberattacks.

The cybersecurity assessment shall be conducted when the system configuration changes and at not more than 5-year intervals.

Documentation of the evaluation, assessment, and certification shall be made available to those authorized to inspect, operate, and maintain the system.

Informational Note No. 1: See ANSI/ISA 62443, *Cybersecurity Standards* series; UL 2900, *Cybersecurity Standards* series; or the *NIST Framework for Improving Critical Infrastructure Cybersecurity*, Version 1.1, for assessment requirements.

Informational Note No. 2: Examples of the commissioning certification used to demonstrate the system has been investigated for cybersecurity vulnerabilities could be one of the following:

- (1) The ISA Security Compliance Institute (ISCI) conformity assessment program
- (2) Certification of compliance by a nationally recognized testing laboratory
- (3) Manufacturer certification for the specific type and brand of system provided

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 14:12:52 EST 2021

Committee Statement

Committee Statement: Cybersecurity is an aspect of safety and reliability in addition to the other factors affecting legally required systems and must be addressed in this code. An attack can affect the control of the legally required system, individual sensors or other IoT devices to the point of either preventing normal operation or displaying the appearance of normal operation while failing the system conditions. Examples of these unsafe conditions include but are not limited to, changing overcurrent protection settings, generator controls, SCADA systems, emergency stop functions, motor controllers, or fire protection systems.

Response Message: FR-8880-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8881-NFPA 70-2021 [Section No. 701.10]****701.10** Wiring Legally Required Standby Systems.

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

(A) General.

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

(B) Wiring.

Wiring from a legally required source to supply legally required and other (nonlegally required) loads shall be in accordance with the following:

- (1) The common bus of switchgear, sections of a switchboard, or individual enclosures shall be either of the following:
 - a. Supplied by single or multiple feeders without overcurrent protection at the source
 - b. Supplied by single or multiple feeders with overcurrent protection, provided that the overcurrent protection that is common to a legally required system and any nonlegally required system(s) is selectively coordinated with the next downstream overcurrent protective device in the nonlegally required system(s).

Informational Note: See Informational Note Figure 701.10(B)(a) and Informational Note Figure 701.10(B)(b) for further information.

Figure Informational Note Figure 701.10(B)(a) Single or Multiple Feeders Without Overcurrent Protection.

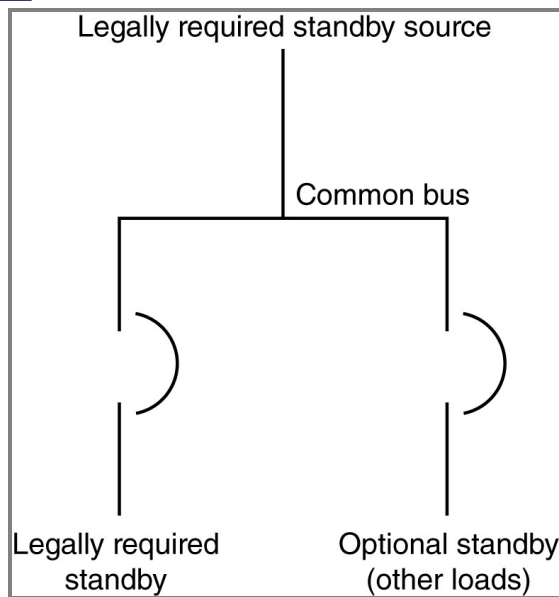
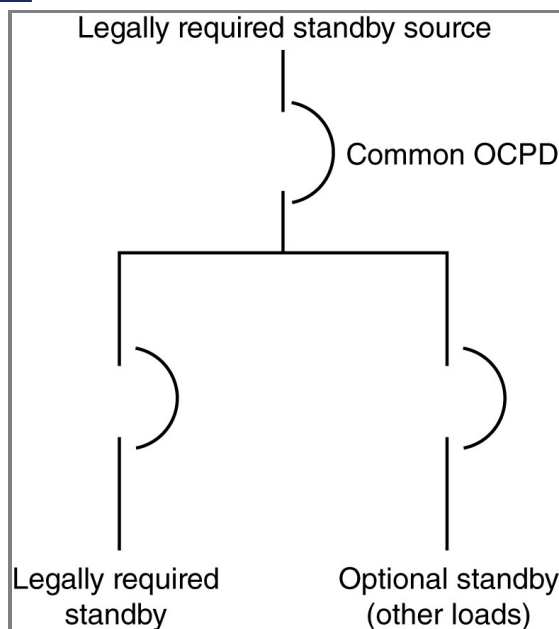


Figure Informational Note Figure 701.10(B)(b) Single or Multiple Feeders with Overcurrent Protection.



Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_P13_FR8881_701.10_attachment.docx	For Staff Use - NEC_P13_FR8881_701.10_attachment	

Submitter Information Verification

Committee: NEC-P13

Submission Date: Tue Jan 12 14:24:43 EST 2021

Committee Statement

Committee Statement: This revision provides correlation with 700.10(B)(5)(b). Legally required systems are installed to supply loads, such as heating and refrigeration systems, communications 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. Therefore, it is necessary to require a limited level of selective coordination where legally required systems are installed in accordance with this revised requirement.

Response Message: FR-8881-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters
3 Not Returned
19 Affirmative All
0 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned

Jordan, Robert E.
Paulsen, Shawn
White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biaison, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8879-NFPA 70-2021 [Section No. 701.12(B)]****(B) Equipment Design and Location.**

Consideration shall be given to the location or design, or both, of all equipment to minimize the hazards that might cause complete failure due to floods, fires, icing, and vandalism.

Informational Note: ~~For further information, see~~ See ANSI/IEEE 493-2007, *Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems*, for further information .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 14:07:33 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8879-NFPA 70-2021

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8967-NFPA 70-2021 [Sections 701.12(C), 701.12(D)]****(C) Storage-Battery Supply Duration .**

The alternate power source shall be of suitable rating and capacity to supply and maintain the total load for the duration determined by the system design. In no case shall the duration be less than 2 hours of system operation. Additionally, the power source shall comply with 701.12(C)(1) through (C)(5) as applicable.

(1) On-Site Fuel Supply.

An on-site fuel supply shall be provided, sufficient for not less than 2 hours operation of the system.

(2) Internal Combustion Engines as Prime Mover Fuel Transfer Pumps .

~~Where internal combustion engines are used as the prime mover, an on-site fuel supply shall be provided with an on-premises fuel supply sufficient for not less than 2 hours of full-demand operation of the system. Where power is needed for the operation of the fuel transfer pumps to deliver fuel to a generator set day tank, the pumps the source, these pumps shall be connected to the legally required standby power system.~~

(3) Public Gas System, Municipal Water Supply.

~~Prime movers Sources shall not be solely dependent on a public utility gas system for their fuel supply or on a municipal water supply for their cooling systems. Means shall be provided for automatically transferring one fuel supply to another where dual fuel supplies are used.~~

Exception: Where approved by the authority having jurisdiction, the use of other than on-site fuels shall be permitted where there is a low probability of a simultaneous failure of both the off-site fuel delivery system and power from the outside electrical utility company. Where a public gas system is approved, the requirements of 701.12(C)(1) shall not apply.

(4) Storage Batteries and UPS.

Storage batteries and uninterruptable power supply systems used to supply standby illumination shall be of suitable rating and capacity to supply and maintain the total load for a minimum period of 1½ hours, without the voltage applied to the load falling below 87½ percent of normal nominal voltage . Automotive-type batteries shall not be used. An automatic battery charging means shall be provided.

(5) Automatic Fuel Source Transfer.

Where dual fuel sources are used, means shall be provided for automatically transferring from one fuel source to another.

Detail FR-8965

(D) Generator Set.**(1) Prime Mover-Driven.**

For a generator set driven by a prime mover approved by the authority having jurisdiction and sized in accordance with 701.4, means shall be provided for automatically starting the prime mover upon failure of the normal service power source and for automatic transfer and operation of all required electrical circuits. A time-delay feature permitting a 15-minute setting shall be provided to avoid retransfer in case of short-time reestablishment of the normal source.

(2) Internal Combustion Engines as Prime Mover.

~~Where internal combustion engines are used as the prime mover, an on-site fuel supply shall be provided with an on-premises fuel supply sufficient for not less than 2 hours of full-demand operation of the system. Where power is needed for the operation of the fuel transfer pumps to deliver fuel to a generator set day tank, the pumps shall be connected to the legally required standby power system.~~

(2) ~~Public Gas System, Municipal Water Supply.~~

~~Prime movers shall not be solely dependent on a public utility gas system for their fuel supply or on a municipal water supply for their cooling systems. Means shall be provided for automatically transferring one fuel supply to another where dual fuel supplies are used.~~

~~Exception: Where approved by the authority having jurisdiction, the use of other than on-site fuels shall be permitted where there is a low probability of a simultaneous failure of both the off-site fuel delivery system and power from the outside electrical utility company.~~

(2) Battery Power.

Where a storage battery is used for control or signal power or as the means of starting the prime mover, it shall be suitable for the purpose and shall be equipped with an automatic charging means independent of the generator set.

(3) Outdoor Generator Sets.

Where an outdoor-housed generator set is equipped with a readily accessible disconnecting means in accordance with 445.18, and the disconnecting means is located within sight of the building or structure supplied, an additional disconnecting means shall not be required where ungrounded conductors serve or pass through the building or structure. Where the generator supply conductors terminate at a disconnecting means in or on a building or structure, the disconnecting means shall meet the requirements of 225.36.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
CMP13_FR8967_701.12_C_D_attachment.docx	For Staff Uses - NEC_P13_FR8967_701.12_C_D_attachment	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 11:26:42 EST 2021

Committee Statement

Committee Statement: The requirements in 701.12(D)(2) and (D)(3) were moved to 701.12(C) to correlate with revisions to that section. The requirements apply to more than just generator sources and this action moves them into a common requirement section.

See the action on 701.12(C). A new last sentence is added in the exception to 701.12(C)(3) to permit, where approved, a public gas system need not comply with 701.12(C)(1).

The existing requirements for storage batteries are relocated to 701.12(C)(4) with this revision.

The title was revised in order to have a common section for the legally required source duration required regardless of the source type(s). Additionally, the fuel supply, storage, and transfer pump requirements included are moved from 701.12(D)(2) since these should apply to any applicable sources and not just generators.

Response Message: FR-8967-NFPA 70-2021

[Public Input No. 2823-NFPA 70-2020 \[Section No. 701.12\(D\)\]](#)

[Public Input No. 2822-NFPA 70-2020 \[New Section after 701.12\(C\)\]](#)

[Public Input No. 2820-NFPA 70-2020 \[Section No. 701.12\(C\)\]](#)

[Public Input No. 1039-NFPA 70-2020 \[Section No. 701.12\(D\)\(3\)\]](#)

[Public Input No. 4166-NFPA 70-2020 \[Section No. 701.12\(D\)\(2\)\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8886-NFPA 70-2021 [Section No. 701.12(E)]****(E) Uninterruptible Power Supplies Stored-Energy Power Supply Systems (SEPSS) .**

Uninterruptible power supplies used to provide power for legally required standby systems shall comply with 701.12(B) and (C) Stored energy power supply systems shall comply with 701.12(E)(1) and (E)(2) .

(1) Types.

Systems shall consist of one or more of the following system types:

(1) Uninterruptible power supply (UPS)

Informational Note: See UL 1778, *Uninterruptable Power Systems* , for further information.

(2) Fuel cell system**(3) Energy storage system (ESS)****(4) Storage battery****(5) Other approved equivalent stored energy sources that comply with 701.12****(2) Fire Protection, Suppression, Ventilation, and Separation.**

The systems in 701.12(E)(1) shall be installed with the fire protection, suppression, ventilation, and separation requirements specified in the manufacturer's instructions or equipment listing.

Informational Note: See NFPA 853 -2020, *Standard for the Installation of Stationary Fuel Cell Power Systems*, and NFPA 855 -2020, *Standard for the Installation of Stationary Energy Storage Systems* , for additional information on fire protection installation requirements.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 14:49:39 EST 2021

Committee Statement

Committee Statement: This revision expands what can be utilized for the newly defined stored-energy power supply systems (SEPSS) to include a number of different technologies that are currently available and can be used for this application including UPS, fuel cell systems, ESS, storage batteries for DC loads and an "other" option since these technologies may not represent an all-inclusive list.

Response Message: FR-8886-NFPA 70-2021

Public Input No. 2825-NFPA 70-2020 [Section No. 701.12(E)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8889-NFPA 70-2021 [Section No. 701.12(F)]****(F) Separate Service.**

Where approved, ~~a separate service shall be permitted as by the authority having jurisdiction as suitable for use as a legally required source of standby power, an additional service shall be permitted~~. This service shall be in accordance with Article 230, and the following additional requirements: with a separate service drop or lateral or a separate set of overhead or underground service conductors sufficiently remote electrically and physically from any other service to minimize the possibility of simultaneous interruption of supply from an occurrence in another service.

- (1) Separate overhead service conductors, service drops, underground service conductors, or service laterals shall be installed.
- (2) The service conductors for the separate service shall be installed sufficiently remote electrically and physically from any other service conductors to minimize the possibility of simultaneous interruption of supply from an occurrence in another service .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 15:01:05 EST 2021

Committee Statement

Committee Statement: This revision is editorial in nature and correlates with 700.12(F).

Response Message: FR-8889-NFPA 70-2021

Public Input No. 4023-NFPA 70-2020 [Section No. 701.12(F)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 8969-NFPA 70-2021 [Section No. 701.12(H)]****~~(H) Fuel Cell System.~~**

~~Fuel cell systems used as a source of power for legally required standby systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.~~

~~Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692.~~

~~Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the legally required standby system.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 13 11:57:54 EST 2021

Committee Statement

Committee Statement: The requirements in 701.12(H) for fuel cell systems are addressed in the revised 701.12(E) for stored energy power supply systems. See FR-8886.

Response Message: FR-8969-NFPA 70-2021

[Public Input No. 2826-NFPA 70-2020 \[Section No. 701.12\(H\)\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 8891-NFPA 70-2021 [Section No. 701.12(I)]****(H) DC Microgrid Systems.**

~~Sources connected to a dc microgrid system shall be permitted where the system is capable of being isolated from all nonlegally required sources~~ On-site sources, designated as legally required standby sources, shall be permitted to be connected to a microgrid system .

~~A dc microgrid system used as a source of power for legally required systems shall be of suitable rating and capacity to supply and maintain the total legally required load for not less than 2 hours of full-demand operation~~ The system shall isolate the legally required standby system from all nonlegally required loads when the normal electric supply is interrupted or shall meet the requirements of 701.4(C). Interruption or partial or complete failure of the normal source(s) shall not impact the availability, capacity, and duration provided by the designated legally required standby sources .

~~Where a dc microgrid system source serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the legally required standby system~~ The designated stored-energy legally required standby power source(s) of a microgrid system shall be permitted to remain interconnected to any available power production source during operation of the legally required standby source(s) where the lack of, or failure of, the interconnected power production source(s), or related controls, does not impact system operation. Interconnected power production sources, other than the designated SEPSS, shall not be required to meet the requirements of Article 701 .

Submitter Information Verification

Committee: NEC-P13

Submission Date: Tue Jan 12 15:10:28 EST 2021

Committee Statement

Committee Statement: This section is modified to recognize that there are different types of microgrids, in addition to any that might be categorized as dc only. The first sentence is similar to the 2020 language but modified to include other microgrid configurations.

New second sentence clarifies that, similar to optional standby systems, non- legally required loads are permitted to be supplied by the legally required standby sources within the microgrid but these shall be isolated from the legally required standby sources during system operation, or shall be controlled per 701.4(C). Language to address the condition where there is a failure of one or more interconnected sources not categorized as legally required standby sources is addressed in the third sentence. Failures with legally required sources require a malfunction signal in 701.6 however other sources are not included so this language has been added. This language would require that an analysis of these conditions is considered in the installation of such a system.

The final paragraph provides an allowance that where a stored-energy emergency legally required source, such as a battery or ESS, is used as part of the legally required standby system, it shall be permitted to be charged by other sources, not just those categorized as legally required standby sources. This is not a blanket allowance however, since an analysis must be performed to ensure that the lack of any of these sources, or any failure within them, will not impact the ability of the system to supply the legally required standby loads.

Response Message: FR-8891-NFPA 70-2021

Public Input No. 2827-NFPA 70-2020 [Section No. 701.12(I)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8893-NFPA 70-2021 [Section No. 701.12(J)]

(I) Unit Equipment Battery-Equipped Emergency Luminaires, Used for Legally Required Standby Systems .

Individual unit equipment Battery-equipped emergency luminaires used for legally required standby illumination systems shall consist of the following comply with 700.12(H) :

- (0) ~~A rechargeable battery~~
- (0) ~~A battery charging means~~
- (0) ~~Provisions for one or more lamps mounted on the equipment and shall be permitted to have terminals for remote lamps~~
- (0) ~~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 supply and maintain the total lamp load associated with the unit for not less than the following:~~

- (0) ~~For a period of 1 ¹/₂ hours, without the voltage falling below 87 ¹/₂ percent of normal voltage~~
- (0) ~~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.~~

~~Unit equipment shall be permanently fixed in place (i.e., not portable) and shall have all wiring to each unit installed in accordance with the requirements of any of the wiring methods in Chapter 3 . Flexible cord and plug connection shall be permitted, provided that the cord does not exceed 900 mm (3 ft) in length. The branch circuit feeding the unit equipment shall be the same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches. Legally required standby luminaires that obtain power from a unit equipment and are not part of the unit equipment shall be wired to the unit equipment by one of the wiring methods of Chapter 3 .~~

~~Exception: In a separate and uninterrupted area supplied by a minimum of three normal lighting circuits, a separate branch circuit for unit equipment shall be permitted if it originates from the same panelboard as that of the normal lighting circuits and is provided with a lock-on feature.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 15:23:44 EST 2021

Committee Statement

Committee Statement: The requirements for unit equipment applied in a legally required system are modified to very simply apply 700.12(I). This revision is necessary to correlate this requirement with revisions made in this and previous NEC cycles.

Response Message: FR-8893-NFPA 70-2021

Public Input No. 4106-NFPA 70-2020 [Section No. 701.12(J)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8895-NFPA 70-2021 [Section No. 701.32]

701.32 Selective Coordination.

~~Legally required standby system(s) overcurrent devices shall be selectively coordinated with all supply-side overcurrent protective devices.~~

~~Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.~~

~~*Exception:- Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.*~~

~~Informational Note: See Informational Note Figure 701.32 for an example of how legally required standby system overcurrent protective devices (OCPDs) selectively coordinate with all supply-side OCPDs.~~

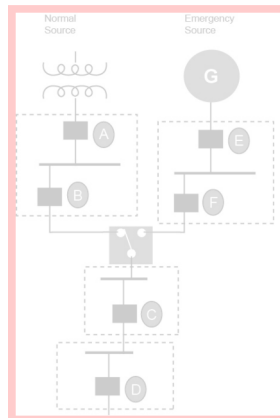
~~OCPD D selectively coordinates with OCPDs C, F, E, B, and A.~~

~~OCPD C selectively coordinates with OCPDs F, E, B, and A.~~

~~OCPD F selectively coordinates with OCPD E.~~

~~OCPD B is not required to selectively coordinate with OCPD A because OCPD B is not a legally required standby system OCPD.~~

**Figure Informational Note Figure
701.32 Legally Required Standby System
Selective Coordination.**



(A) General.

Legally required standby system(s) overcurrent protective devices (OCPDs) shall be selectively coordinated with all supply-side overcurrent protective devices and load-side OCPDs .

Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

(B) Replacements.

Where legally required standby OCPDs are replaced, they shall be reevaluated to ensure selective coordination is maintained with all supply-side and load-side OCPDs.

(C) Modifications.

Where modifications, additions, or deletions to the legally required standby system(s) occur, selective coordination of the legally required system(s) OCPDs with all supply-side and load-side OCPDs shall be reevaluated.

Exception: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.

Informational Note: See Informational Note Figure 701.32 for an example of how legally required standby system ~~overcurrent protective devices (OCPDs)~~ OCPDs selectively coordinate with all supply-side OCPDs.

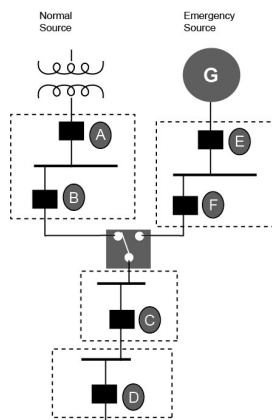
OCPD D selectively coordinates with OCPDs C, F, E, B, and A.

OCPD C selectively coordinates with OCPDs F, E, B, and A.

OCPD F selectively coordinates with OCPD E.

OCPD B is not required to selectively coordinate with OCPD A because OCPD B is not a legally required standby system OCPD.

**Figure Informational Note Figure
701.32 Legally Required Standby System
Selective Coordination.**

**Submitter Information Verification**

Committee: NEC-P13

Submittal Date: Tue Jan 12 15:33:30 EST 2021

Committee Statement

Committee Statement: The parent text is modified for clarity with respect to overcurrent protective devices (OCPD's) and the words "load-side" are added in (A), (B), and (C) to clarify that selective coordination must be analyzed both upstream and downstream.

This revision clarifies existing requirements where legally required standby system OCPD's are replaced, modified, added or deleted. This is done to ensure that selective coordination with all supply-side and load-side OCPD's is maintained.

Response Message: FR-8895-NFPA 70-2021

[Public Input No. 3373-NFPA 70-2020 \[Section No. 701.32\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8898-NFPA 70-2021 [Section No. 702.4(B)(1)]****(1) Manual and Nonautomatic Transfer Equipment.**

Where manual or nonautomatic transfer equipment is used, an optional standby system shall have adequate capacity and rating for the supply of all equipment intended to be operated at one time. The user of the optional standby system shall be permitted to select the load connected to the system.

Informational Note: Manual and nonautomatic transfer equipment use human intervention.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 15:49:19 EST 2021

Committee Statement

Committee Statement: The addition of “non-automatic” equipment correlates with applicable product standards. An informational note has been added to clarify that both manual and non-automatic transfer equipment utilized human intervention.

Response Message: FR-8898-NFPA 70-2021

Public Input No. 2249-NFPA 70-2020 [Section No. 702.4(B)(1)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Caron, Daniel J.

702.4 should be modified to be consistent with 700.4(C). 702.4 does not reference "Emergency Systems" or "Legally Required Systems". A generator serving Optional Standby loads can also serve Emergency Loads and Legally Required loads, and the order of priority should be (re)stated.



First Revision No. 9614-NFPA 70-2021 [Section No. 702.5]

702.5 Interconnection or Transfer Equipment.

(A) General.

~~Transfer~~ Interconnection or transfer equipment shall be required for all standby systems subject to the requirements of this article ~~and for which an electric utility supply is either the normal or standby source. Transfer switches shall not be permitted to be reconditioned.~~ Equipment shall be suitable for the intended use and shall be listed, designed, and installed so as to prevent the inadvertent interconnection of all sources of supply in any operation of the equipment.

Exception: Temporary connection of a portable generator without transfer equipment shall be permitted where conditions of maintenance and supervision ensure that only qualified persons service the installation and where the normal supply is physically isolated by a lockable disconnecting means or by disconnection of the normal supply conductors.

(B) ~~Meter-Mounted~~ Transfer Switches.

(1) Reconditioned.

Transfer switches shall not be permitted to be reconditioned.

(2) Meter-Mounted Transfer Switches.

Transfer switches installed between the utility meter and the meter enclosure shall be listed meter-mounted transfer switches and shall be approved. Meter-mounted transfer switches shall be of the manual or nonautomatic type unless rated as determined by 702.4(B)(2).

Informational Note No. 1: ~~For more information, see~~ See UL 1008M, *Transfer Switch Equipment, Meter Mounted*, for more information.

Informational Note No. 2: Manual and nonautomatic transfer equipment use human intervention.

(C) Documentation.

In other than dwelling units, the short-circuit current rating of the transfer equipment, based on the specific overcurrent protective device type and settings protecting the transfer equipment, shall be field marked on the exterior of the transfer equipment.

~~(D) Inadvertent Interconnection.~~

~~Transfer equipment shall be suitable for the intended use and shall be listed, designed, and installed so as to prevent the inadvertent interconnection of all sources of supply in any operation of the transfer equipment.~~

(D) Parallel Installation.

~~Transfer equipment and electric power production systems~~ Systems installed to permit operation in parallel with the normal source shall also meet the requirements Part I or Part II of Article 705.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 28 12:49:04 EST 2021

Committee Statement

Committee Statement: The addition of “non-automatic” equipment correlates with applicable product standards. This revision editorially reorganizes the requirements of this section for clarity. Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual. An informational note is added in 702.5(B)(2) to clarify that both manual and non-automatic transfer equipment utilize human intervention. The proposed first level subdivision is not included as it violates the NEC

style manual.

Response FR-9614-NFPA 70-2021
Message:

[Public Input No. 2062-NFPA 70-2020 \[Section No. 702.5\(B\)\]](#)

[Public Input No. 1559-NFPA 70-2020 \[Section No. 702.5\]](#)

[Public Input No. 3602-NFPA 70-2020 \[Section No. 702.5\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnolddo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8904-NFPA 70-2021 [Section No. 702.7(A)]****(A) Standby.**

A sign shall be placed at the service-entrance equipment for commercial and installations, industrial installations, and multifamily housing that indicates the type and location of each on-site optional standby power source. For one- and two-family dwelling units, a sign shall be placed at the disconnecting means required in 230.85 that indicates the location of each permanently installed on-site optional standby power source disconnect or means to shut down the prime mover as required in 445.18(D).

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 16:21:55 EST 2021

Committee Statement

Committee Statement: This revision adds signage requirements for multifamily housing as it is necessary for first responders and maintenance personnel.

Response Message: FR-8904-NFPA 70-2021

Public Input No. 4501-NFPA 70-2020 [Section No. 702.7(A)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

"Commercial" and "industrial" are vague terms, little used in the code. both terms would ideally be replaced with "other than dwelling unit". The addition of "multifamily housing" is important as it closes a hole in the current code language. I support the intent of the FR, I do think the language should be adjusted for the sake of clarity.

**First Revision No. 8907-NFPA 70-2021 [Section No. 702.12(B)]****(B) Portable Generators 15 kW or Less.**

Where a portable generator, rated 15 kW or less, is installed using a flanged inlet or other cord-and-plug-type connection, a disconnecting means shall not be required where ungrounded conductors serve or pass through a building or structure. The flanged inlet or other cord-and-plug-type connection shall be located outside of a building or structure.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 16:30:37 EST 2021

Committee Statement

Committee Statement: There is no practical reason to permit inlets or other connections indoors for portable generators. This will help to ensure that cables are not run through openings in buildings or structures and will also help to discourage the use of portable generators indoors.

Response Message: FR-8907-NFPA 70-2021

Public Input No. 622-NFPA 70-2020 [Section No. 702.12(B)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

18 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnolando L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Negative with Comment

Grover, Matthew B

There are installations that benefit from the installation of the generator connection point within the structure. For attached buildings without outdoor space on the property, the installation of the connection point in an open, ventilated, or otherwise unoccupied part of the structure can improve safety. An open multilevel parking garage is one example of such a space. By requiring the connection point to be outside of the structure, the possibility exists of forcing a portable generator to be located on a sidewalk, in public rights of way, or otherwise impeding pedestrians or motorists and impacting their safety.

**First Revision No. 9074-NFPA 70-2021 [Section No. 706.1]****706.1 Scope.**

This article applies to all energy storage systems (ESS) having a capacity greater than 3.6 MJ (1 kWh) that may be stand-alone or interactive with other electric power production sources. These systems are primarily intended to store and provide energy during normal operating conditions.

Informational Note No. 1: For batteries rated in ampere hours, kWh is equal to the nominal rated voltage times ampere-hour rating divided by 1000.

Informational Note No. 2: ~~There can be a subtle distinction between a battery storing energy and an energy storage system. A battery storing energy is not necessarily an ESS. See Article 480. An ESS can be comprised of batteries storing energy. See Article 706. See Article 480 for installations that meet the definition of stationary standby batteries and are composed of lead-acid or nickel-cadmium cells. For all other chemistries and for lead-acid and nickel-cadmium stored energy systems that do not fall under the definition of stationary standby batteries, this article applies.~~

Informational Note No. 3: The following standards are frequently referenced for the installation of ~~energy storage systems~~ ESSs :

- (1) NFPA 1 -2021, Fire Code
- (2) NFPA 111-2016 2019, Standard on Stored Electrical Energy Emergency and Standby Power Systems
- (3) NECA 416-2016, Recommended Practice for Installing Energy Storage Systems (ESS)
- (4) UL 810A, Electrochemical Capacitors
- (5) NFPA 855 -2020, Standard for the Installation of Stationary Energy Storage Systems
- (6) UL 1973, Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power, and Light Electric Rail (LER) Applications
- (7) UL 1989, Standard for Standby Batteries
- (8) UL 9540, Standard for Safety Energy Storage Systems and Equipment
- (9) UL Subject 2436, Spill Containment For Stationary Lead Acid Battery Systems

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 14:17:22 EST 2021

Committee Statement

Committee Statement: Informational Note No. 2 was revised to allow users to distinguish between Articles 480 and 706. This revision is consistent with the scope changes to Article 480.

NFPA 1 was added with other standards referenced in Informational Note No. 3.

NFPA 855 was added with other standards referenced in Informational Note No. 3.

A hyphen was added between "ampere" and "hours" in Informational Note No. 1 for compliance with the NEC Style Manual.

Response Message: FR-9074-NFPA 70-2021

[Public Input No. 4613-NFPA 70-2020 \[Section No. 706.1\]](#)

[Public Input No. 803-NFPA 70-2020 \[Section No. 706.1\]](#)

[Public Input No. 254-NFPA 70-2020 \[Section No. 706.1\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9075-NFPA 70-2021 [Definition: Energy Storage System (ESS).]

Energy Storage System (ESS).

One or more ~~components assembled together~~ devices installed as a system capable of storing energy and providing electrical energy into the premises wiring system or an electric power production and distribution network. (CMP-13)

Informational Note No. 1: An ESS(s) can include but is not limited to batteries, capacitors, and kinetic energy devices (e.g., flywheels and compressed air). ~~Energy storage systems~~ An ESS(s) can include inverters or converters to change voltage levels or to make a change between an ac or a dc system.

Informational Note No. 2: These systems differ from ~~other storage systems such as a UPS system, which is a power supply used to provide alternating current power to a load for some period of time in the event of a power failure~~ a stationary standby battery installation where a battery spends the majority of the time on continuous float charge or in a high state of charge, in readiness for a discharge event .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 14:28:13 EST 2021

Committee Statement

Committee Statement: These revisions are consistent with the scope changes in Article 480 which will allow users to distinguish between Articles 480 and 706.

Response Message: FR-9075-NFPA 70-2021

Public Input No. 4211-NFPA 70-2020 [Definition: Energy Storage System (ESS).]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve
Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9076-NFPA 70-2021 [Definition: Flow Battery.]

Flow- Battery, Flow. (Flow Battery)

An energy storage component ~~similar to a fuel cell~~ that stores its active materials in the form of one or two electrolytes external to the reactor interface. When in use, the electrolytes are transferred between reactor and storage tanks. (706) (CMP-13)

Informational Note: ~~Two~~ Three commercially available flow battery technologies are zinc air, zinc bromine, and vanadium redox, sometimes referred to as *pumped electrolyte ESS*.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 14:34:09 EST 2021

Committee Statement

Committee Statement: The definition of a flow battery is revised to delete the reference to a fuel cell because it suggests that they are very similar which they are not. Flow batteries and fuel cells are different technologies and subjected to different safety criteria. The definition is also revised to recognize there are flow batteries with one active electrolyte.

The informational note is revised to add an additional flow battery technology.

Response Message: FR-9076-NFPA 70-2021

Public Input No. 1603-NFPA 70-2020 [Definition: Flow Battery.]

Public Input No. 4216-NFPA 70-2020 [Definition: Flow Battery.]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.
Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 9078-NFPA 70-2021 [Section No. 706.6]

706.6 Multiple Systems.

Multiple ESSs shall be permitted to be installed ~~in or on a single building or structure~~ on the same premises.

Submitter Information Verification

Committee: NEC-P13

Submission Date: Thu Jan 14 14:52:41 EST 2021

Committee Statement

Committee Statement: Some ESS will not be in or on a building or structure. The revised text better allows for such applications as outdoor systems, or microgrids.

Response Message: FR-9078-NFPA 70-2021

[Public Input No. 4223-NFPA 70-2020 \[Section No. 706.6\]](#)

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9079-NFPA 70-2021 [Section No. 706.7]

706.7 Commissioning and Maintenance.

Energy storage systems shall be maintained in proper and safe operating condition. The required maintenance shall be in accordance with the manufacturer's requirements and industry standards. A written record of the system maintenance shall be kept and shall include records of repairs and replacements necessary to maintain the system in proper and safe operating condition.

Informational Note: For information related to general electrical equipment maintenance and developing an effective electrical preventive maintenance (EPM) program, see NFPA 70B -2019, *Recommended Practice for Electrical Equipment Maintenance*, or ANSI/NETA ATS-2017, *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems*.

(A) Commissioning.

ESSs shall be commissioned upon installation. This shall not apply in one- and two-family dwellings where the ESS does not exceed a 20 kWh capacity.

Informational Note: See NFPA 855 -2020, *Standard for the Installation of Stationary Energy Storage Systems*, for information related to the commissioning of ESSs.

(B) Maintenance.

Energy storage systems ESSs shall be maintained in proper and safe operating condition. The required maintenance shall be in accordance with the manufacturer's requirements and industry standards. A written record of the system maintenance shall be kept and shall include records of repairs and replacements necessary to maintain the system in proper and safe operating condition.

Informational Note: For See NFPA 70B -2019, *Recommended Practice for Electrical Equipment Maintenance*, or ANSI/NETA ATS-2017, *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems*, for information related to general electrical equipment maintenance and developing an effective electrical preventive maintenance (EPM) program, see NFPA 70B -2019, *Recommended Practice for Electrical Equipment Maintenance*, or ANSI/NETA ATS-2017, *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems*.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 14:54:58 EST 2021

Committee Statement

Committee Statement: This revision adds commissioning requirements for ESS in a new (A). The existing requirements for maintenance are moved into a new (B). Commissioning requirements are added to align with Chapter 6 of NFPA 855-2020. ESS systems require setup and initial performance verification for devices and equipment necessary for proper system operation and safety. Operational controls, system sequence of operation, and fire safety systems are examples of items typically covered during commissioning activities. The requirement to include as-built documentation and a record of the actions taken to correct any shortcomings will enhance the safety of those who will operate, maintain, and service the equipment. The addition of 20 kWh for one- and two- family dwellings is included to align with the requirements of NFPA 855.

The Informational Note to (B) is revised for compliance with 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response FR-9079-NFPA 70-2021

Message:

[Public Input No. 2885-NFPA 70-2020 \[Section No. 706.7\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

17 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Ball, Greg J.

While supportive in general I believe there should be further consideration of the practical exemption for one and two family dwellings, for both commissioning and maintenance.

Grover, Matthew B

The inclusion of an exception for small residential ESS in subsection (A) is warranted for installations of that size. As ESS in residential settings can be very small, care should be taken to provide exceptions for such systems where the impact on safety is negligible.

**First Revision No. 9081-NFPA 70-2021 [Section No. 706.8]****~~706.8 Storage Batteries.~~**

~~Storage batteries not associated with an ESS shall comply with Article 480 .~~

Submitter Information Verification

Committee: NEC-P13

Submission Date: Thu Jan 14 15:00:07 EST 2021

Committee Statement

Committee Statement: Section 706.8 is deleted. The changes to Informational Note No. 2 in the scope of this Article make this section redundant and no longer necessary.

Response Message: FR-9081-NFPA 70-2021

[Public Input No. 4227-NFPA 70-2020 \[Section No. 706.8\]](#)

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9086-NFPA 70-2021 [Section No. 706.15]****706.15 Disconnecting Means.****(A) ESS Disconnecting Means.**

~~A disconnecting means~~ Means shall be provided for all ungrounded conductors derived from an to disconnect the ESS and shall be permitted to be integral to listed ESS equipment. The disconnecting means shall comply with all of the following: from all wiring systems, including other power systems, utilization equipment, and its associated premises wiring.

- ~~(0) The disconnecting means shall be readily accessible.~~
- ~~(0) The disconnecting means shall be located within sight of the ESS. Where it is impractical to install the disconnecting means within sight of the ESS, the disconnect shall be installed as close as practicable, and the location of the disconnecting means shall be field marked on or immediately adjacent to the ESS. The marking shall be of sufficient durability to withstand the environment involved and shall not be handwritten.~~
- ~~(0) The disconnecting means shall be lockable open in accordance with 110.25 .~~

~~For one-family and two-family dwellings, a disconnecting means or its remote control shall be located at a readily accessible location outside the building.~~

~~(B) Remote Actuation.~~

~~Where controls to activate the disconnecting means of an ESS are used and are not located within sight of the system, the location of the controls shall be field marked on the disconnecting means.~~

~~(B) Location and Control.~~

The disconnecting means shall be readily accessible and shall comply with one or more of the following:

- (1) Located within the ESS
- (2) Located within sight and within 3 m (10 ft) from the ESS
- (3) Where not located within sight of the ESS, the disconnecting means, or the enclosure providing access to the disconnecting means, shall be capable of being locked in accordance with 110.25

Where controls to activate the disconnecting means of an ESS are used and are not located within sight of the ESS, the disconnecting means shall be lockable in accordance with 110.25, and the location of the controls shall be marked on the disconnecting means.

For one- and two-family dwellings, an ESS shall include an emergency shutdown function to cease the export of power from the ESS to premises wiring of other systems. An initiation device(s) shall be located at a readily accessible location outside the building and shall plainly indicate whether in the "off" or "on" position. The "off" position of the device(s) shall perform the ESS emergency shutdown function.

(C) Notification and Marking.

Each ESS disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position and be permanently marked as follows:

“ ENERGY STORAGE SYSTEM DISCONNECT.”

The disconnecting means shall be legibly marked in the field to indicate the following:

- (1) Nominal ESS ~~ac output voltage and maximum ESS dc voltage~~
- (2) Available fault current derived from the ESS
- (3) An arc-flash label applied in accordance with acceptable industry practice
- (4) Date the calculation was performed

Exception: List items (2), (3), and (4) shall not apply to one- and two-family dwellings.

Informational Note No. 1: See NFPA 70E -2018, Standard for Electrical Safety in the Workplace . ~~Industry for industry practices for equipment labeling are described in NFPA 70E -2018, Standard for Electrical Safety in the Workplace~~ . This standard provides specific criteria for developing arc-flash labels for equipment that provides nominal system voltage, incident energy levels, arc-flash boundaries, minimum required levels of personal protective equipment, and so forth.

Informational Note No. 2: ~~Battery equipment suppliers can provide information about available fault current on any particular battery model~~ ESS electronics could include inverters or other types of power conversion equipment .

For ESS disconnecting means where the line and load terminals ~~may~~ could be energized in the open position, the device shall be marked with the following words or equivalent:

WARNING

ELECTRIC SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD

SIDES MAY BE ENERGIZED IN THE OPEN POSITION

The notification(s) and marking(s) shall comply with 110.21(B).

(D) Partitions Between Components.

Where circuits from the input or output terminals of energy storage components in an ESS pass through a wall, floor, or ceiling, a readily accessible disconnecting means shall be provided within sight of the energy storage component. Fused disconnecting means or circuit breakers shall be permitted to be used.

(E) Disconnecting Means for Batteries.

In cases where the battery is separate from the ESS electronics and is subject to field servicing, 706.15(C)(1) through (C)(4) shall apply.

Informational Note: Batteries could include an enclosure, battery monitoring and controls, or other related battery components.

(1) Disconnecting Means.

A disconnecting means shall be provided for all ungrounded conductors. A disconnecting means shall be readily accessible and located within sight of the battery.

Informational Note: See 240.21(H) for information on the location of the overcurrent device for battery conductors.

(2) Disconnection of Series Battery Circuits.

Battery circuits exceeding 240 volts dc nominal between conductors or to ground shall have provisions to disconnect the series-connected strings into segments not exceeding 240 volts dc nominal for maintenance by qualified persons. Non-load-break bolted or plug-in disconnects shall be permitted.

(3) Remote Activation.

Where a disconnecting means is provided with remote controls to activate the disconnecting means and the controls for the disconnecting means are not located within sight of the battery, the disconnecting means shall be capable of being locked in the open position, in accordance with 110.25, and the location of the controls shall be field marked on the disconnecting means.

(4) Notification.

The disconnecting means shall be legibly marked in the field. The marking shall be of sufficient durability to withstand the environment involved and shall include the following:

(1) Nominal battery voltage

(2) Available fault current derived from the stationary standby battery system

Informational Note No. 1: Battery equipment suppliers can provide information about available fault current on any particular battery model.

(3) An arc-flash label in accordance with acceptable industry practice

Informational Note No. 2: See NFPA 70E -2021, Standard for Electrical Safety in the Workplace, for assistance in determining the severity of potential exposure, planning safe work practices, determining arc-flash labeling, and selecting personal protective equipment.

(4) Date the calculation was performed

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
CMP13_FR9086_706.15_attachment.docx	For Staff Use - NEC_P13_FR9086_706.15_attachment	

Submitter Information Verification

Committee: NEC-P13

Submission Date: Thu Jan 14 16:07:22 EST 2021

Committee Statement

Committee Statement: System level disconnect and emergency shutdown function requirements are revised to be consistent with other similar articles. Additional requirements are added for separate enclosures containing only batteries or battery components.

706.15(C)(1) is modified to clarify that only one system voltage is required to be labeled.

706.15(C) Informational No. 1 is revised for compliance with 3.1.3.1 and 4.1.3 of the NEC Style Manual and is changed to "Informational Note" as Informational No. 2 is deleted and relocated to new 706.15(E)(4).

Response Message: FR-9086-NFPA 70-2021

Public Input No. 463-NFPA 70-2020 [Section No. 706.15]

Public Input No. 1870-NFPA 70-2020 [Section No. 706.15]

Public Input No. 4256-NFPA 70-2020 [Section No. 706.15]

Public Input No. 805-NFPA 70-2020 [Section No. 706.15(C)]

Public Input No. 4104-NFPA 70-2020 [Section No. 706.15(A)]

Public Input No. 3488-NFPA 70-2020 [Section No. 706.15(A)]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9089-NFPA 70-2021 [Section No. 706.20(A)]****(A) Ventilation.**

Provisions appropriate to the energy storage technology shall be made for sufficient diffusion and ventilation of any possible gases from the storage device, if present, to prevent the accumulation of an explosive mixture. Ventilation of an ESS shall be permitted to be provided in accordance with the manufacturer's recommendations and listing for the system.

~~Informational Note No. 1: See NFPA 1 -2018, *Fire Code* NFPA 855 -2020 , Chapter 52, for ventilation considerations for specific battery chemistries~~ *Standard for the Installation of Stationary Energy Storage Systems* , for technology-specific guidance. Not all ESS technologies require ventilation.

~~Informational Note No. 2: Some storage technologies do not require ventilation.~~

~~Informational Note No. 2: A source for design of ventilation of battery systems is~~ See IEEE 1635-2018/ASHRAE Guideline 21-2018, *Guide for the Ventilation and Thermal Management of Batteries for Stationary Applications*, ~~as a source for design of ventilation of batteries .~~

~~Informational Note No. 4: Fire protection considerations are addressed in NFPA 1 -2018, *Fire Code* .~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 16:48:44 EST 2021

Committee Statement

Committee Statement: A reference to NFPA 855 is being added to replace existing Informational Note No. 1. The references to NFPA 1 in Informational Notes 1 and 4 are being deleted as most information on batteries has been removed from the latest version of NFPA 1 and new standard NFPA 855 includes requirements for fire protection considerations as well as ventilation.

The information of Informational Note No. 2 has been deleted and its information relocated into Informational Note No. 1.

Informational Note No. 3 is revised for compliance with 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-9089-NFPA 70-2021

Public Input No. 4277-NFPA 70-2020 [Section No. 706.20(A)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9090-NFPA 70-2021 [Section No. 706.31(A)]****(A) Circuits and Equipment.**

ESS circuit conductors shall be protected in accordance with the requirements of Article 240. Protection devices for ESS circuits shall be in accordance with the requirements of 706.31(B) through (F). Circuits shall be protected at the source from overcurrent.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 14 17:01:24 EST 2021

Committee Statement

Committee Statement: The phrase "the requirements of" are deleted in two places. This use of this phrase is unnecessary and the deletions do not change the meaning of the section.

Response Message: FR-9090-NFPA 70-2021

Public Input No. 4110-NFPA 70-2020 [Section No. 706.31(A)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

17 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Ball, Greg J.

While this FR is an improvement from the 2020 language, the panel rejected a PI to clarify requirements for ESS circuits that shall be protected "at the source from overcurrent." ESS systems with listed power electronic interfaces are current limited, and as such the appropriate location for overcurrent protection of conductors is at the utility side electric panel. However, text as written is interpreted by some AHJs as requiring overcurrent protection at both the panel and the ESS output - often only a few feet away from each other. This is a point of confusion that should be addressed.

Little, Linda J.

The first sentence needs an editorial correction to read properly. However, it should be deleted as it is not necessary (90.3 already address code arrangement) and contains violations of the NEC style manual

**First Revision No. 9133-NFPA 70-2021 [Section No. 706.40]****706.40 General.**

~~All electrical connections to and from the system and system components shall be in accordance with the applicable provisions of Article 692 . The system and system components shall also meet Parts I, II, and III of this article. Unless otherwise directed by this article, flow battery ESS shall comply with the applicable provisions of Article 692 .~~

Informational Note: See NFPA 855-2020, *Standard for the Installation of Stationary Energy Storage Systems* , for installation requirements for ESS, including requirements for flow batteries.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 12:45:14 EST 2021

Committee Statement

Committee Statement: Flow batteries are not fuel cell systems and should not reference Article 692 for requirements. The Informational Note refers users to NFPA 855 for the installation of ESS specific to flow batteries.

Response Message: FR-9133-NFPA 70-2021

Public Input No. 1604-NFPA 70-2020 [Section No. 706.40]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9134-NFPA 70-2021 [Section No. 706.50]****706.50 General.**

All electrical connections to and from the system and system components shall be in accordance with the applicable provisions of this *Code*. ~~Unless otherwise directed by this article, other energy storage technologies~~ The systems shall comply with the applicable provisions of Part III of Article 705 Parts I, II, and III of this article .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 12:52:56 EST 2021

Committee Statement

Committee Statement: The reference to Article 705 was incorrect as there is no Part III of that article. However, the requirements outlined in the previous parts of Article 706 would apply to these other systems.

Response Message: FR-9134-NFPA 70-2021

Public Input No. 3114-NFPA 70-2020 [Section No. 706.50]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8909-NFPA 70-2021 [Section No. 708.1]

708.1 Scope.

This article applies to the installation, operation, monitoring, control, and maintenance of the portions of the premises wiring system intended to supply, distribute, and control electricity to designated critical operations areas (DCOA) in the event of disruption to elements of the normal system.

Critical operations power systems are those systems so classed by municipal, state, federal, or other codes by any governmental agency having jurisdiction or by facility engineering documentation establishing the necessity for such a system. These systems include but are not limited to power systems, HVAC, fire alarm, security, communications, and signaling for designated critical operations areas.

Informational Note No. 1: Critical operations power systems are generally installed in vital infrastructure facilities that, if destroyed or incapacitated, would disrupt national security, the economy, public health or safety; and where enhanced electrical infrastructure for continuity of operation has been deemed necessary by governmental authority.

Informational Note No. 2: ~~For further information on disaster and emergency management, see See NFPA 1600-2019, *Standard on Continuity, Emergency, and Crisis Management*, for further information on disaster and emergency management .~~

Informational Note No. 3: ~~For further information regarding performance of emergency and standby power systems, see See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for further information regarding performance of emergency and standby power systems .~~

Informational Note No. 4: ~~For specification of locations where emergency lighting is considered essential to life safety, see See NFPA 101-2018 2021 , *Life Safety Code*, or the applicable building code, for specification of locations where emergency lighting is considered essential to life safety .~~

Informational Note No. 5: ~~For further information regarding physical security, see See NFPA 730-2018 2020 , *Guide for Premises Security*, and ANSI/TIA-5017-2016, *Telecommunications Physical Network Security Standard* , for further information regarding physical security .~~

Informational Note No. 6: See *NFPA 1600 -2019, Standard on Continuity, Emergency, and Crisis Management* , A.5.3.2. Threats to facilities that may require transfer of operation to the critical systems include both naturally occurring hazards and human-caused events. ~~See also A.5.3.2 of NFPA 1600 -2019, *Standard on Continuity, Emergency, and Crisis Management* .~~

Informational Note No. 7: See Informative Annex F, Availability and Reliability for Critical Operations Power Systems; and Development and Implementation of Functional Performance Tests (FPTs) for Critical Operations Power Systems.

Informational Note No. 8: See Informative Annex G, Supervisory Control and Data Acquisition (SCADA).

Informational Note No. 9: Text that is followed by a reference in brackets has been extracted from *NFPA 1600-2019, Standard on Continuity, Emergency, and Crisis Management*. Only editorial changes were made to the extracted text to make it consistent with this *Code*.

Submitter Information Verification

Committee: NEC-P13

Submission Date: Tue Jan 12 16:40:19 EST 2021

Committee Statement

Committee Statement: An additional reference is made to ANSI/TIA-5017-2016 Telecommunications Physical Network Security Standard. This document includes requirements and guidelines for the physical network security including risk assessment, several levels of security to match the risk assessment to prevent vandalism, theft, etc. Informational note 3 is modified to promote harmonization with NFPA 110.

Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8909-NFPA 70-2021

[Public Input No. 4179-NFPA 70-2020 \[Definition: Critical Operations Power Systems \(COPS\).\]](#)

[Public Input No. 1711-NFPA 70-2020 \[Section No. 708.1\]](#)

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Curran, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8911-NFPA 70-2021 [Definition: Commissioning.]

Commissioning.

The acceptance testing, integrated system testing, operational tune-up, and start-up testing is the process by which baseline test results verify the proper operation and sequence of operation of electrical equipment, in addition to developing baseline criteria by which future trend analysis can identify equipment deterioration. process, procedures, and testing used to set up and verify the initial performance, operational controls, safety systems, and sequence of operation of electrical devices and equipment, prior to it being placed into active service. (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 16:51:32 EST 2021

Committee Statement

Committee Statement: The commissioning of electrical devices and systems are paramount to ensure a safe installation that complies with the requirements in the NEC. This often includes special setup steps to adjust device and system settings, performing verification tests, interlock and safety system operational performance, and validation of the sequence of operation. This revision adds clarity to the definition and encompasses more of the purpose intended with this term.

Response Message: FR-8911-NFPA 70-2021

[Public Input No. 2887-NFPA 70-2020 \[Definition: Commissioning.\]](#)

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.



First Revision No. 8913-NFPA 70-2021 [Section No. 708.4 [Excluding any Sub-Sections]]

Risk assessment for critical operations power systems shall be documented and shall be conducted in accordance with 708.4(A) through (C).

Informational Note: See Chapter 5 of *NFPA 1600-2019, Standard on Continuity, Emergency, and Crisis Management*, which provides additional guidance concerning risk assessment and hazard analysis.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 16:55:06 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8913-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8915-NFPA 70-2021 [Section No. 708.6(C)]****(C) Maintenance.**

The authority having jurisdiction shall require a documented preventive maintenance program for critical operations power systems.

Informational Note: ~~For information concerning maintenance, see~~ See NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*, for information concerning maintenance.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:05:53 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8915-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8914-NFPA 70-2021 [New Section after 708.6(E)]****708.7 Cybersecurity.**

COPS that are connected to a communication network and have the capability to permit control of any portion of the premises COPS shall comply with either of the following:

- (1) The ability to control the system is limited to a direct connection through a local nonnetworked interface.
- (2) It is connected through a networked interface complying with one of the following methods:
 - a. The system and associated software are identified as being evaluated for cybersecurity.
 - b. A cybersecurity assessment is conducted on the connected system to determine vulnerabilities to cyberattacks.

The cybersecurity assessment shall be conducted when the system configuration changes and at not more than 5-year intervals.

Documentation of the evaluation, assessment, and certification shall be made available to those authorized to inspect, operate, and maintain the system.

Informational Note No. 1: See ANSI/ISA 62443, *Cybersecurity Standards* series; UL 2900, *Cybersecurity Standards* series; or the *NIST Framework for Improving Critical Infrastructure Cybersecurity*, Version 1.1, for assessment requirements.

Informational Note No. 2: Examples of the commissioning certification used to demonstrate the system has been investigated for cybersecurity vulnerabilities could be one of the following:

- (1) The ISA Security Compliance Institute (ISCI) conformity assessment program
- (2) Certification of compliance by a nationally recognized test laboratory
- (3) Manufacturer certification for the specific type and brand of system provided

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 16:57:58 EST 2021

Committee Statement

Committee Statement: Cybersecurity is an aspect of safety and reliability in addition to the other factors affecting COPS and must be addressed in this code. An attack can affect control of the COPS, individual sensors or other IoT devices to the point of either preventing normal operation or displaying the appearance of normal operation while failing the system.

Examples of these unsafe conditions include but are not limited to, changing overcurrent protection settings, generator controls, SCADA systems, COPS stop functions, motor controllers, or fire protection systems.

Response Message: FR-8914-NFPA 70-2021

Public Input No. 3083-NFPA 70-2020 [Section No. 708.4]

Public Input No. 3087-NFPA 70-2020 [Section No. 708.8]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8916-NFPA 70-2021 [Section No. 708.6(E)]****(E) Testing Under Load.**

Means for testing all critical power systems during maximum anticipated load conditions shall be provided.

Informational Note: For See NFPA 110 -2019, *Standard for Emergency and Standby Power Systems*, for information concerning testing and maintenance of emergency power supply systems (EPSSs) that are also applicable to COPS, ~~see NFPA 110 -2019, *Standard for Emergency and Standby Power Systems*.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:07:36 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8916-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8917-NFPA 70-2021 [Section No. 708.8(A)]

(A) Commissioning Plan.

A commissioning plan shall be developed and documented.

Informational Note No. 1: ~~For further information on developing a commissioning program see~~ See NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*, for further information on developing a commissioning program .

Informational Note No. 2: See 708.7 for cybersecurity assessments.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:10:50 EST 2021

Committee Statement

Committee Statement: An informational note is added to send the code user to new section 708.7 which is created to supplement the commissioning plan.

Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8917-NFPA 70-2021

Public Input No. 2888-NFPA 70-2020 [Section No. 708.8(A)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8921-NFPA 70-2021 [Section No. 708.8(D)]

(D) Functional Performance Tests.

A functional performance test program shall be established, documented, and executed upon complete installation of the critical system in order to establish a baseline reference for future performance requirements.

Informational Note: See Informative Annex F, Availability and Reliability for Critical Operations Power Systems; and Development and Implementation of Functional Performance Tests (FPTs) for Critical Operations Power Systems, for more information on developing and implementing a functional performance test program.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:20:11 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8921-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9615-NFPA 70-2021 [Section No. 708.10(C)(2)]****(2) Fire Protection for Feeders.**

Feeders shall meet one of the following conditions:

- (1) The cable or raceway is protected by a listed electrical circuit protective system with a minimum 2-hour fire rating.

Informational Note No. 1: ~~The listing organization provides information for electrical circuit protection systems on proper installation requirements to maintain the fire rating See UL 1724, *Fire Tests for Electrical Circuit Protective Systems*, for one method of defining an electrical circuit protective system, by establishing a rating when tested. UL *Guide Information for Electrical Circuit Integrity Systems* (FHIT) contains information to identify the system and its installation limitations to maintain a minimum 2-hour fire resistive rating .~~

- (2) The cable or raceway is a listed fire-resistive cable system with a minimum 2-hour fire rating.

Informational Note No. 2: ~~Fire-resistive cables are tested to See ANSI/ UL 2196-2017, *Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control and Data Cables*, for testing requirements for fire-resistive cables .~~

Informational Note No. 3: The listing organization provides information for fire-resistive cable systems on proper installation requirements to maintain the fire rating.

- (3) The cable or raceway is protected by a listed fire-rated assembly that has a minimum fire rating of 2 hours.
- (4) The cable or raceway is encased in a minimum of 50 mm (2 in.) of concrete.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Thu Jan 28 16:54:34 EST 2021

Committee Statement

Committee Statement: The informational notes are revised to reflect the proper title of the standards and compliance with the NEC style manual. The reference to ANSI is deleted and the permitted methods to protect the cables are provided in an informational form.

Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual and to correlate with 700.1.

Response Message: FR-9615-NFPA 70-2021

[Public Input No. 2313-NFPA 70-2020 \[Section No. 708.10\(C\)\(2\)\]](#)

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters
3 Not Returned
17 Affirmative All

- 2 Affirmative with Comments
- 0 Negative with Comments
- 0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Caron, Daniel J.

Although I agree with FR 9615, I disagree with the Panel action to resolve PI's 1037 and 3717. The issue of concrete thickness vs. fire rating has been debated in Panel 13 for many cycles prompting the NFPA Research Foundation to conduct a comprehensive study in December 2018. The study was conducted to determine the proper thickness of concrete to achieve a 2-hour fire rating. The study concludes definitively that 2 inches of concrete, regardless of the type of concrete used, DOES NOT achieve a 2-hour fire rating. Although different types of concrete achieve a 2-hour fire rating at different thicknesses, and the study concluded that 5 inches of any type of concrete do achieve the required fire rating, this Panel should not simply resolve the PI's because it thinks a thickness of 5" is onerous. This Panel should have created a first revision, with performance criteria, using language such as; "The cable or raceway is encased in concrete with a thickness sufficient to achieve a 2-hour fire rating."; and a Fine Print Note referencing the NFPA Research Foundation report.

Conrad, James S.

I agree with the action on FR-9615 which addressed PI 2313 for section 708.10(C)(2) or more specifically 708.10(C)(2)(1) - electrical circuit protective system and 708.10(C)(2)(2) – fire resistive cables system. Section 708.10(C)(2)(1) and (2) requires 2-hours protection as well as 708.20(B). Section 708.20(B) requires the equipment be installed in a room that is fully protected by a fully automated fire protection system or in a space with a 2-hour fire rating. Notice that there is no construction requirement for how to

construct the room. This is left up to the designer and contractor to meet the 2-hour requirements. However, CMP-13 resolved PI 3717 & 1037 for section 708.10(C)(2)(4), which allows 2 inches of concrete encasement. Part of the committee statement for PI 3717 states "It is understood that 2-inches of concrete may not equal a 2-hour fire rating. The engineer must determine the fire rating based on many factors including the mix or aggregate of concrete." CMP-13 needs to make sure all the methods meet the 2-hour requirements and needs to revisit this section during the second draft meeting.

**First Revision No. 8931-NFPA 70-2021 [Section No. 708.14]****708.14** Wiring of HVAC, Fire Alarm, Security, Emergency Communications, and Signaling Systems.

All conductors or cables shall be installed using any of the metal wiring methods permitted by 708.10(C)(1) and, in addition, shall comply with the following, as applicable:

- (1) All cables for fire alarm, security, signaling systems, and emergency communications shall be shielded twisted pair cables or installed to comply with the performance requirements of the system.
- (2) Shields of cables for fire alarm, security, signaling systems, and emergency communications shall be arranged in accordance with the manufacturer's published installation instructions.
- (3) Optical fiber cables shall be used for connections between two or more buildings on the property and under single management.
- (4) A listed primary protector shall be provided on all communications circuits. Listed secondary protectors shall be provided at the terminals of the communications circuits.
- (5) Conductors for all control circuits rated above 50 volts shall be rated not less than 600 volts.
- (6) Communications, fire alarm, and signaling circuits shall use relays with contact ratings that exceed circuit voltage and current ratings in the controlled circuit.
- (7) All cables for fire alarm, security, emergency communications, and signaling systems shall be riser-rated and shall be part of a listed 2-hour ~~electrical circuit protective system~~. ~~Emergency communications cables shall be fire-resistive cable system or protected by Type CMR-CI or shall be riser-rated and shall be~~ a listed 2-hour electrical circuit protective system.
- (8) Control, monitoring, and power wiring to HVAC systems shall be part of a listed 2-hour fire-resistive cable system or protected by a listed 2-hour electrical circuit protective system.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:38:14 EST 2021

Committee Statement

Committee Statement: Type CMR-CI cables are rated for "free air" installation and this section requires Type CMR cables to be installed in a raceway per 708.10, therefore it is deleted to minimize confusion.

Additionally, the text is revised to reflect the proper language such that a 2-hour listed fire-resistive cable system or a 2-hour electrical circuit protected system meets the requirement. The text is updated to remain consistent with other uses throughout the NEC®, for correlation.

Response Message: FR-8931-NFPA 70-2021

Public Input No. 3928-NFPA 70-2020 [Section No. 708.14]

Public Input No. 2314-NFPA 70-2020 [Section No. 708.14]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8933-NFPA 70-2021 [Section No. 708.20(A)]****(A) General Requirements.**

Current supply shall be such that, in the event of failure of the normal supply to the DCOA, critical operations power shall be available within the time required for the application. The supply system for critical operations power, 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 708.20(E) through (H).

Informational Note No. 1: Assignment of degree of reliability of the recognized critical operations power system depends on the careful evaluation in accordance with the risk assessment.

Informational Note No. 2: ~~For guidance about determining degree of reliability, see~~ See IEEE 3006.5–2014, *Recommended Practice for the Use of Probability Methods for Conducting a Reliability Analysis of Industrial and Commercial Power Systems*, for guidance about determining degree of reliability.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:45:04 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8933-NFPA 70-2021

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 8937-NFPA 70-2021 [Section No. 708.20(F)(1)]****(1) Prime Mover-Driven.**

Generator sets driven by a prime mover shall be provided with means for automatically starting the prime mover on failure of the normal ~~service~~ power source . A time-delay feature permitting a minimum 15-minute setting shall be provided to avoid retransfer in case of short-time reestablishment of the normal source.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:52:31 EST 2021

Committee Statement

Committee Statement: Normal service implies that the normal or primary power source can only be a utility per the NEC definition of “service.” This section was revised to say “power source” to allow other types of sources for the normal power. This revision also harmonizes with NFPA 110.

Response Message: FR-8937-NFPA 70-2021

Public Input No. 4175-NFPA 70-2020 [Section No. 708.20(F)(1)]

Ballot Results

✔ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8938-NFPA 70-2021 [Section No. 708.21]

708.21 Ventilation.

Adequate ventilation shall be provided for the alternate power source for continued operation under maximum anticipated ambient temperatures.

Informational Note: See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, and NFPA 111-2019, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, include for additional information on ventilation air for combustion and cooling.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:53:54 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8938-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8939-NFPA 70-2021 [Section No. 708.24(A)]****(A) General.**

Transfer equipment, including automatic transfer switches, shall be automatic, listed, and identified for emergency use. Transfer equipment shall be designed and installed to prevent the inadvertent interconnection of normal and critical operations sources of supply in any operation of the transfer equipment. Transfer equipment and electric power production systems installed to permit operation in parallel with the normal source shall meet the requirements of Article 705.

Transfer equipment shall not be permitted to be reconditioned.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 17:59:20 EST 2021

Committee Statement

Committee Statement: A listing requirement is added to 708.24 to provide correlation throughout the code that all types of transfer equipment shall be listed.

Response Message: FR-8939-NFPA 70-2021

Public Input No. 455-NFPA 70-2020 [Section No. 708.24(A)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 8944-NFPA 70-2021 [Section No. 708.54]

708.54 Selective Coordination.

Critical operations power system(s) overcurrent devices shall be selectively coordinated with all supply-side overcurrent protective devices.

Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

Exception: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.

Informational Note: See Informational Note Figure 708.54 for an example of how critical operations power system overcurrent protective devices (OCPDs) selectively coordinate with all supply-side OCPDs.

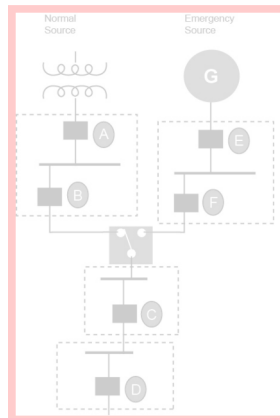
OCPD D selectively coordinates with OCPDs C, F, E, B, and A.

OCPD C selectively coordinates with OCPDs F, E, B, and A.

OCPD F selectively coordinates with OCPD E.

OCPD B is not required to selectively coordinate with OCPD A because OCPD B is not a critical operations power system OCPD.

Figure Informational Note Figure 708.54 Critical Operations Power System Selective Coordination.



(A) General.

Critical operations power system(s) overcurrent protective devices (OCPDs) shall be selectively coordinated with all supply-side overcurrent protective devices and load-side OCPDs.

Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

(B) Replacements.

Where critical operations power system(s) OCPDs are replaced, they shall be reevaluated to ensure selective coordination is maintained with all supply-side and load-side OCPDs.

(C) Modifications.

Where modifications, additions, or deletions to the critical operations power system(s) occur, selective coordination of the critical operations power system(s) OCPDs with all supply-side and load-side OCPDs shall be reevaluated.

Exception: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.

Informational Note: See Informational Note Figure 708.54 for an example of how critical operations power system ~~overcurrent protective devices~~ (OCPDs) selectively coordinate with all supply-side OCPDs.

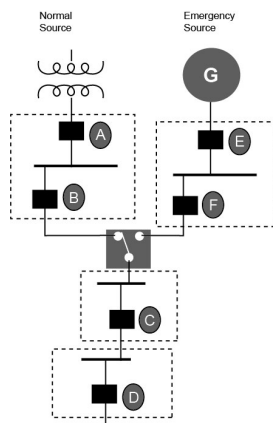
OCPD D selectively coordinates with OCPDs C, F, E, B, and A.

OCPD C selectively coordinates with OCPDs F, E, B, and A.

OCPD F selectively coordinates with OCPD E.

OCPD B is not required to selectively coordinate with OCPD A because OCPD B is not a critical operations power system OCPD.

**Figure Informational Note Figure
708.54 Critical Operations Power System
Selective Coordination.**

**Submitter Information Verification**

Committee: NEC-P13

Submittal Date: Tue Jan 12 18:07:36 EST 2021

Committee Statement

Committee Statement: The parent text is modified for clarity with respect to overcurrent protective devices (OCPDs) and the words “load-side” are added in (A), (B), and (C) to clarify that selective coordination must be analyzed both upstream and downstream.

This revision clarifies existing requirements where critical operations power system OCPDs are replaced, modified, added or deleted. This is done to ensure that selective coordination with all supply-side and load-side OCPD's is maintained.

Response Message: FR-8944-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 8942-NFPA 70-2021 [Section No. 708.64]****708.64** Emergency Operations Plan.

A facility with a COPS shall have a documented ~~an~~ emergency operations plan. The plan shall consider emergency operations and response, recovery, and continuity of operations.

Informational Note: See *NFPA 1600-2019, Standard on Continuity, Emergency, and Crisis Management*, Section 5.7, which provides guidance for the development and implementation of emergency plans.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 12 18:05:33 EST 2021

Committee Statement

Committee Statement: Revisions are made to comply with sections 3.1.3.1 and 4.1.3 of the NEC Style Manual.

Response Message: FR-8942-NFPA 70-2021

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9114-NFPA 70-2021 [New Section after 712.4]

712.8 Commissioning.

Direct current microgrid systems shall be commissioned upon installation.

Submitter Information Verification

Committee: NEC-P13

Submission Date: Fri Jan 15 10:34:52 EST 2021

Committee Statement

Committee Statement: This revision creates a new section that requires commissioning.

Response Message: FR-9114-NFPA 70-2021

Public Input No. 2894-NFPA 70-2020 [New Section after 712.4]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9115-NFPA 70-2021 [Section No. 712.25]

712.25 Identification of Circuit Conductors.

~~Ungrounded circuit~~ Circuit conductors in dc microgrids ~~that are not solidly grounded~~ shall be identified according to the requirements of 210.5(C)(2) for branch circuits and 215.12(C)(2) for feeders.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 10:37:52 EST 2021

Committee Statement

Committee Statement: Revisions are made to clarify that the requirements apply to any circuit conductors that are not solidly grounded such as “referenced grounded” or “functionally grounded”.

Response Message: FR-9115-NFPA 70-2021

[Public Input No. 4510-NFPA 70-2020 \[Section No. 712.25\]](#)

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

18 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnaldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

Affirmative with Comment

Grover, Matthew B

This would be an excellent addition to the code. Addressing the common inclusion of reference grounded conductors in microgrids is necessary. This change, and others like it, will ensure that the NEC remains relevant as the fields of energy storage and site generated power expand and change rapidly.



First Revision No. 9116-NFPA 70-2021 [Section No. 712.35]

712.35 Disconnection of Ungrounded Conductors.

In solidly grounded two- and three-wire systems, the disconnecting means shall simultaneously open all ungrounded conductors. In ungrounded, resistively grounded, functionally grounded, and reference-grounded systems, such devices shall open all current-carrying conductors.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 10:39:27 EST 2021

Committee Statement

Committee Statement: The term “functionally grounded” is added to clarify the required disconnecting means operation for this system type.

Response Message: FR-9116-NFPA 70-2021

Public Input No. 4522-NFPA 70-2020 [Section No. 712.35]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9117-NFPA 70-2021 [Section No. 712.55]

712.55 Ground-Fault Detection Equipment.

Ungrounded, reference grounded, or functionally grounded dc microgrids operating at greater than 60 volts dc shall have ground-fault detection that indicates that a fault has occurred. The ground-fault equipment shall be marked in accordance with 250.167(C) or in accordance with any marking rules that apply to the power source equipment .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 10:42:26 EST 2021

Committee Statement

Committee Statement: Revisions are made to provide clarity for the marking of various system dc grounding system types.

Response Message: FR-9117-NFPA 70-2021

Public Input No. 4533-NFPA 70-2020 [Section No. 712.55]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9118-NFPA 70-2021 [Section No. 712.57]****712.57** Arc-Fault Protection.

Where required elsewhere in this *Code*, specific systems within the dc microgrid shall have arc-fault protection. The arc-fault protection equipment shall be listed.

Informational Note: Section See 90.4 ~~applies~~ when suitable equipment for arc-fault protection is not available.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 10:43:47 EST 2021

Committee Statement

Committee Statement: Revisions are made to conform with the NEC Style Manual 3.1.3.1 and 4.1.3.

Response Message: FR-9118-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

Little, Linda J.

Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.



First Revision No. 9119-NFPA 70-2021 [New Definition after Definition: Monitor.]

750.6 Listing.

Energy management systems shall be listed under one of the following conditions:

- (1) Listed as a complete energy management system
- (2) Listed as a kit for field installation in switch or overcurrent device enclosures
- (3) Identified as a recognized component of a field-installed accessory kit as part of the listed equipment

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 10:48:45 EST 2021

Committee Statement

Committee Statement: Revisions are made to include listing requirements for energy management systems to ensure compliance with industry safety standards.

Response Message: FR-9119-NFPA 70-2021

Public Input No. 1951-NFPA 70-2020 [New Definition after Definition: Monitor.]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 9120-NFPA 70-2021 [Section No. 750.50]****750.50** Field Markings Directory .

Where an energy management system is employed to control electrical power through the use of a remote means, a directory identifying the controlled device(s) and circuit(s) shall be posted on the enclosure of the controller, disconnect, or branch-circuit overcurrent device.

~~Informational Note: The use of the term *remote* is intended to convey that a controller can be operated via another means or location through communications without a direct operator interface with the controlled device.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 10:54:21 EST 2021

Committee Statement

Committee Statement: The title of the section was revised for clarity. The informational note has been deleted as the term "remote" is widely understood.

Response Message: FR-9120-NFPA 70-2021

Public Input No. 1952-NFPA 70-2020 [Section No. 750.50]

Ballot Results

✔ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

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Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

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Tice, Richard

Windey, Timothy P.



First Revision No. 9124-NFPA 70-2021 [Section No. G(2)]

(2) Testing.

SCADA systems shall be tested periodically under actual or simulated contingency conditions.

Informational Note No. 1: Periodic system testing procedures can duplicate or be derived from the recommended functional performance testing procedures of individual components, as provided by the manufacturers.

Informational Note No. 2: ~~For more information on maintenance and testing of SCADA,~~
see See NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*, for more information on maintenance and testing of SCADA.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 11:16:25 EST 2021

Committee Statement

Committee Statement: Revisions are made to conform to the NEC Style Manual 3.1.3.1 and 4.1.3.

Response Message: FR-9124-NFPA 70-2021

Ballot Results

✓ This item has passed ballot

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald

Cantor, William P.

Caron, Daniel J.

Conrad, James S.

Currin, Jr., Richard D.

Czarnecki, Neil A.

Froemming, Steven F.

Grover, Matthew B

Jonas, Jeff

Kovacik, John R.

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Marchand, Greg

Neeser, Daniel R.

Rodriguez, Arnoldo L.

Spina, Mario C.

Tice, Richard

Windey, Timothy P.

**First Revision No. 9122-NFPA 70-2021 [Section No. G(B)]****(B) Power Supply.**

The SCADA system power supply shall comply with ~~(B)(1) through (B)(3)~~ the following :

- (1) The power supply shall be provided with a direct-current station battery system, rated between 24 and 125 volts dc, with a 72-hour capacity.
- (2) The batteries of the SCADA system shall be separate from the batteries for other electrical systems.
- (3) The power supply shall be provided with a ~~properly installed listed~~ surge-protective device ~~(TVSS) at its terminals with (SPD)~~. The SPD shall be installed at the line-side terminals of the power supply in accordance with Part II of Article 242, with a direct low-impedance path to ground. Protected and unprotected circuits shall be physically separated to prevent coupling.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 15 11:12:22 EST 2021

Committee Statement

Committee Statement: Revisions were made to correct the acronym and provide a reference to Part II of Article 242. The existing text was modified for clarity.

Response Message: FR-9122-NFPA 70-2021

Public Input No. 3734-NFPA 70-2020 [Section No. G(B)]

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

Biason, Krista McDonald
Cantor, William P.
Caron, Daniel J.
Conrad, James S.
Currin, Jr., Richard D.
Czarnecki, Neil A.
Froemming, Steven F.
Grover, Matthew B
Jonas, Jeff
Kovacik, John R.
Little, Linda J.
Marchand, Greg
Neeser, Daniel R.
Rodriguez, Arnaldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.

**First Revision No. 9617-NFPA 70-2021 [Part V.]****Part V. Flow Battery Energy Storage Systems ESSs**

Part V applies to ESSs composed of or containing flow batteries.

Informational Note: Due to the unique design features and difference in operating characteristics of flow batteries as compared with that of storage batteries such as lead acid or lithium ion batteries, the requirements for flow batteries have been included here ~~herein rather than in Article 480~~ (Article 706, Part V) .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 29 09:08:20 EST 2021

Committee Statement

Committee Statement: The Informational Note is deleted as it is no longer necessary due to the changes in the scope of Article 480 which clarify that Article 480 only applies to lead-acid or nickel-cadmium cells.

The title of Part V is changed from "Flow Battery Energy Storage Systems" to "Flow Battery ESSs" to use the acronym "ESS" for "Energy Storage System."

Response Message: FR-9617-NFPA 70-2021

Ballot Results

✓ **This item has passed ballot**

22 Eligible Voters

3 Not Returned

19 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Jordan, Robert E.

Paulsen, Shawn

White, James R.

Affirmative All

Baldwin, Steve

Ball, Greg J.

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Caron, Daniel J.
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Neeser, Daniel R.
Rodriguez, Arnoldo L.
Spina, Mario C.
Tice, Richard
Windey, Timothy P.