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WORKING DRAFT OF NEC CODE-MAKING PANEL 13 MEETING OUTPUT

CONTENT NOT FINAL – SUBJECT TO REVISION PRIOR TO LETTER BALLOT AND PUBLICATION OF FIRST DRAFT REPORT

Document: National Electrical Code®

Revision Cycle: A2025

Meeting Dates: January 15 - 17, 2024

Panel Activity: Input Stage

This is a working draft, prepared by NFPA staff, to record the output generated at the Code-Making Panel 13 First Draft Meeting. It includes draft copies of the First Revisions and any Global Revisions.

It is being made available to Panel members for the purpose of facilitating early review, particularly for those Panel members who may be seeking input from their respective organizations in preparation for the First Draft Ballot.

First Revision No. 8129-NFPA 70-2024 [Detail]

Remove the term "Standby" in the title of Article 480. Should read:

Article 480 Stationary Batteries

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 14:46:23 EST 2024

Committee Statement

Committee Statement: The term standby is removed from the title of the article to clarify the requirements are applicable to all battery installations.

Response Message: FR-8129-NFPA 70-2024

Public Input No. 3808-NFPA 70-2023 [Article 480]

First Revision No. 8172-NFPA 70-2024 [Detail]

Title change. Remove "Tests" from title. 700.3 should read:

Commissioning and Maintenance.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:25:22 EST 2024

Committee Statement

Committee Statement: This change provides correlation with section 701.3. The definition of servicing is inclusive of maintenance.

Response Message: FR-8172-NFPA 70-2024

Public Input No. 2555-NFPA 70-2023 [Section No. 700.3]

First Revision No. 7513-NFPA 70-2024 [Definition: Control Device, Emergency Lighting. (Emergency ...]

Control Device, Emergency Lighting. (ELCD), (Emergency Lighting Control Device)

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

Submittal Date: Mon Jan 15 09:53:03 EST 2024

Committee Statement

Committee Statement: The acronym ELCD is now commonly used to refer to an Emergency Lighting Control Device. This acronym is also used in the UL924 standard that covers these devices.

Response Message: FR-7513-NFPA 70-2024

Public Input No. 1625-NFPA 70-2023 [Definition: Control Device, Emergency Lighting. (Emergency ...]

First Revision No. 7514-NFPA 70-2024 [Definition: Emergency Luminaire, Directly Controlled. (Dire...]

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

A luminaire supplied by the facility emergency power system and with a control input for dimming or switching 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 15 09:54:38 EST 2024

Committee Statement

Committee Statement: The acronym DCEL is commonly used to describe a Directly Controlled Emergency Luminaire.

Response Message: FR-7514-NFPA 70-2024

Public Input No. 1620-NFPA 70-2023 [Definition: Emergency Luminaire, Directly Controlled. (Dire...]

First Revision No. 7518-NFPA 70-2024 [Definition: Energy Management System (EMS).]

Energy Management System (EMS).

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 power within an electrical ~~load or a power production or storage source~~ system . (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 10:05:31 EST 2024

Committee Statement

Committee Statement: The definition of energy management system is revised for clarity. The existing definition includes both features and device types that may be present, but this has resulted in confusion around the application of EMS requirements. For example, energy metering or communications equipment that is not coupled with controls should not be considered as an energy management system.

Response Message: FR-7518-NFPA 70-2024

Public Input No. 4296-NFPA 70-2023 [Definition: Energy Management System (EMS).]

First Revision No. 7524-NFPA 70-2024 [Definition: Energy Storage System (ESS).]

Energy Storage System (ESS).

One or more devices ~~installed as a system~~ assembled together capable of storing energy ~~and providing electrical energy into the premises wiring system or an electric power production and distribution network. (~~ to supply electrical energy at a future time. (855: 3.3.9) (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). 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 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: Mon Jan 15 10:37:17 EST 2024

Committee Statement

Committee Statement: The definition has been updated to correlate with the definition in NFPA 855. Informational Note No. 2 was retained because no technical substantiation was provided for its removal.

Response Message: FR-7524-NFPA 70-2024

Public Input No. 3863-NFPA 70-2023 [Definition: Energy Storage System (ESS).]

First Revision No. 7505-NFPA 70-2024 [Definition: Generator (Generator Set).]

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: Mon Jan 15 09:07:44 EST 2024

Committee Statement

Committee Statement: A more general definition of Generator (Generator Set) is more appropriate. An inverter does not convert mechanical energy to electrical energy and the term should not be part of the definition of a device that does convert mechanical energy into electrical energy.

Response Message: FR-7505-NFPA 70-2024

Public Input No. 176-NFPA 70-2023 [Definition: Generator (Generator Set).]

First Revision No. 7526-NFPA 70-2024 [Definition: Relay, Automatic Load Control. (Automatic Load ...]

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

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: Mon Jan 15 10:47:25 EST 2024

Committee Statement

Committee Statement: "ALCR" is a commonly used acronym for Automatic Load Control Relay. As such it is added to the definition of this device. Reference style manual 2.1.2.8 and 2.1.2.

Response Message: FR-7526-NFPA 70-2024

Public Input No. 1622-NFPA 70-2023 [Definition: Relay, Automatic Load Control. (Automatic Load ...]

First Revision No. 7530-NFPA 70-2024 [Definition: Transfer Switch, Branch-Circuit Emergency Light...]

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

A device connected on the load side of a branch-circuit overcurrent protective device that transfers only emergency lighting loads from the normal power source to an emergency 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 15 10:51:17 EST 2024

Committee Statement

Committee Statement: The acronym BCELTS is commonly used to describe a Branch Circuit Emergency Lighting Transfer Switch. This acronym is also used in the UL 1008 standard that covers these devices. As such, it is added to the definition of this device. Reference style manual 2.1.2.8 and 2.1.2.9.

Response Message: FR-7530-NFPA 70-2024

Public Input No. 1623-NFPA 70-2023 [Definition: Transfer Switch, Branch-Circuit Emergency Light...]

First Revision No. 7643-NFPA 70-2024 [Definition: Transfer Switch, Bypass Isolation. (Bypass Isol...]

Transfer Switch, Bypass Isolation. (Bypass Isolation Transfer Switch)

A ~~manual, nonautomatic, or automatic operated device used in conjunction with a~~ transfer switch ~~to provide~~ that provides a means ~~of directly connecting load conductors to a power source and of disconnecting~~ to isolate the transfer switch. (CMP-13)

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Tue Jan 16 08:49:45 EST 2024

Committee Statement

Committee Statement: In the 2023 NEC, the definition Bypass Isolation Switch was revised to Bypass
Response Message: FR-7643-NFPA 70-2024

First Revision No. 7534-NFPA 70-2024 [New Definition after Definition: Luminaire.]

Luminaire, Directly Controlled. (DCL)

A luminaire containing a control input for a dimming or switching function. (700) (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 11:07:36 EST 2024

Committee Statement

Committee Statement: This definition is added to address the difference between Directly Controlled Emergency Luminaires that are listed for emergency use and Directly Controlled Luminaires that are similar in function but not listed for emergency use.

Response Message: FR-7534-NFPA 70-2024

Public Input No. 1621-NFPA 70-2023 [New Definition after Definition: Luminaire.]

First Revision No. 7536-NFPA 70-2024 [New Definition after Definition: Suspended Ceiling Grid.]

Switch, Bypass Isolation. (Bypass Isolation Switch)

A manual, nonautomatic, or automatic operated device used in conjunction with a transfer switch to provide a means of bypass that directly connects the load conductors to a power source and allows the transfer switch to be isolated or disconnected. (CMP-13)

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Mon Jan 15 11:09:58 EST 2024

Committee Statement

Committee Statement: A new definition of Bypass Isolation Switch was added to differentiate this device from a bypass isolation transfer switch.

The phrase “used in conjunction with a transfer switch” was not included to make the definition more general and to avoid confusion with the term Bypass Isolation Transfer Switch.

Response Message: FR-7536-NFPA 70-2024

Public Input No. 1337-NFPA 70-2023 [New Definition after Definition: Suspended Ceiling Grid.]

First Revision No. 7511-NFPA 70-2024 [New Definition after Definition: Zone.]

Generator Terminals.

The point of connection for the output conductors on the generator (generator set). (445) (CMP-13)

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 09:42:01 EST 2024

Committee Statement

Committee Statement: These changes will provide clarity to the users of this code. A generator is defined as the complete machine. With that in mind it is appropriate to define "generator terminals". This definition is needed to clarify that the generator terminals are the connection point of the output conductors for the whole generator set not just the generator.

Response Message: FR-7511-NFPA 70-2024

Public Input No. 4442-NFPA 70-2023 [New Definition after Definition: Generator (Generator Set).]

First Revision No. 7764-NFPA 70-2024 [New Definition after Definition: Zone.]

Power Control System (PCS).

Equipment which monitors and controls power within an electrical system to prevent overload of an electrical service, feeder, conductor, or other power distribution equipment. (CMP-13)

Informational Note: A power control system may control generation, energy storage, loads, circuit controllers, or other equipment, to manage power, and may contain additional protective functions relative to EMS or grid interconnection functions.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 18:15:49 EST 2024

Committee Statement

Committee Statement: The definition of power control system was added to define EMS which include an overload control system and correlate with Part II of Article 750.

Response Message: FR-7764-NFPA 70-2024

First Revision No. 7542-NFPA 70-2024 [Section No. 445.6]

445.6 ~~–~~ **2** Listing Requirements .

Stationary generators shall be listed.

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

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

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 11:33:42 EST 2024

Committee Statement

Committee Statement: This change to the title and renumbering complies with the NEC Style Manual 2.2.1.

Response Message: FR-7542-NFPA 70-2024

Public Input No. 3749-NFPA 70-2023 [Section No. 445.6]

First Revision No. 7548-NFPA 70-2024 [Section No. 445.11]

see attached for legislatively correct changes

445.11 Marking.

Each generator shall be provided with an accessible 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) Alternator subtransient, transient, synchronous, and zero sequence reactances

(2) Generator set power rating category (including but not limited to prime, standby, or continuous)

(3) 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.

Supplemental Information

File Name	Description	Approved
70_CMP_13_445.11_FR_7548.docx		
NEC_CMP13_FR-7548_445.11.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 11:50:40 EST 2024

Committee Statement

Committee Statement: The reorganization complies with the NEC Style Manual and improves usability.

Response Message: FR-7548-NFPA 70-2024

Public Input No. 4508-NFPA 70-2023 [Section No. 445.11]

Public Input No. 3170-NFPA 70-2023 [Section No. 445.11]

70_CMP 13_445.1_FR 7548

445.11 Marking.

(A) General.

(1) Nameplate. Each generator shall be provided with an accessible nameplate ~~giving~~ providing the following:

1. ~~the m~~Manufacturer's name~~,~~
2. ~~the r~~Rated frequency~~,~~
3. ~~the n~~Number of phases if ac~~,~~
4. ~~the r~~Rating in kilowatts or kilovolt-amperes~~,~~
5. ~~the p~~Power factor~~,~~
6. ~~the n~~Normal volts and amperes corresponding to the rating~~,~~
7. ~~and the r~~Rated ambient temperature

(2) Neutral Status.

a. Each generator shall be marked ~~Marking shall be provided~~ by the manufacturer to indicate whether or not the generator neutral is bonded to its frame.

b. Where the neutral bonding is modified in the field, additional marking shall be required to indicate whether or not the neutral is bonded to the frame.

(B) Generators rated more than 15 kw. Nameplates or manufacturer's instructions shall provide the following information ~~for all stationary generators and portable generators rated more than 15 kW~~:

(1) Alternator subtransient, transient, synchronous, and zero sequence reactances
(2) Generator set power rating category (including but not limited to prime, standby, or continuous)
(3) 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

First Revision No. 7551-NFPA 70-2024 [Section No. 445.13]

see attached for legislatively correct changes

445.13 Ampacity of Conductors.

(A) General.

The ampacity of the conductors from the generator output terminals to the first distribution device(s) containing overcurrent protection shall not be less than 115 percent of the nameplate current rating of the generator. It shall be permitted to size the neutral conductors in accordance with 220.61. Conductors that must carry ground-fault currents shall not be smaller than required by 250.30(A). Neutral conductors of dc generators that must carry ground-fault currents shall not be smaller than the minimum required size of the largest conductor.

Exception: Where the design and operation of the generator prevent overloading, the ampacity of the conductors shall not be less than 100 percent of the nameplate current rating of the generator.

(B) Overcurrent Protection Provided.

Where the generator set is equipped with a listed overcurrent protective device or a combination of a current transformer and overcurrent relay, conductors shall be permitted to be tapped from the load side of the protected terminals in accordance with 240.21(B).

Tapped conductors shall not be permitted for portable generators rated 15 kW or less where field wiring connection terminals are not accessible.

Supplemental Information

File Name	Description	Approved
70_CMP_13_445.13_FR_7551.docx		
NEC_CMP13_FR-7551_445.13.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 12:22:11 EST 2024

Committee Statement

Committee Statement: The structure of the requirement is modified for improved clarity. The reference to 250.30(A) is changed to 250.35 to cover both separately derived and non-separately derived installation systems. Titles of Section and Sub-sections are changed for applicability. The change to “Conductors – Minimum Ampacity and Size” correlates with Articles 210, 215, and 230.

Response Message: FR-7551-NFPA 70-2024

Public Input No. 4418-NFPA 70-2023 [Section No. 445.13]

70 CMP 13, 445.13, FR 7551

445.13 ~~Ampacity of~~ Conductors – Minimum Ampacity and Size.

~~**(A) General.**~~

~~The ampacity of the conductors from the generator output terminals to the first distribution device(s) containing overcurrent protection shall not be less than 115 percent of the nameplate current rating of the generator. It shall be permitted to size tThe neutral conductors shall be permitted to be sized in accordance with 220.61. Conductors that must carry ground-fault currents shall not be smaller than required by 250.350(A). Where nNeutral conductors of dc generators that must carry ground-fault currents, the neutral conductors shall not be smaller than the minimum required size of the largest conductor.~~

~~*Exception: Where the design and operation of the generator prevent overloading, the ampacity of the conductors shall not be less than 100 percent of the nameplate current rating of the generator.*~~

(~~C~~A) Overcurrent Protection Not Provided.

The ampacity of the conductors from the generator terminals to the first distribution device(s) containing overcurrent protection shall not be less than 115 percent of the nameplate rating of the generator.

Where the design and operation of the generator prevent overloading, the ampacity of the conductors shall not be less than 100 percent of the nameplate current rating of the generator.

(B) Overcurrent Protection Provided.

Where the generator set is equipped with a listed overcurrent protective device or a combination of a current transformer and overcurrent relay, conductors shall be permitted to be tapped from the load side of the protected terminals in accordance with 240.21(B).

Tapped conductors shall not be permitted for portable generators rated 15 kW or less where field wiring connection terminals are not accessible.

(C) Neutral Conductors.

The neutral conductors shall be permitted to be sized in accordance with 220.61. Conductors that carry ground-fault currents shall not be smaller than required by 250.35. Where neutral conductors of dc generators carry ground-fault currents, the neutral conductors shall not be smaller than the minimum required size of the largest conductor.

First Revision No. 7563-NFPA 70-2024 [Section No. 445.19(A)]

(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~~ lockable open in accordance with 110.25.

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Mon Jan 15 13:31:37 EST 2024

Committee Statement

Committee Statement: The revision aligns with NEC Style Manual 3.2.5 and Section 110.25.
Response Message: FR-7563-NFPA 70-2024

Public Input No. 2539-NFPA 70-2023 [Section No. 445.19(A)]

Public Input No. 3702-NFPA 70-2023 [Section No. 445.19(A)]

First Revision No. 7571-NFPA 70-2024 [Sections 445.19(B), 445.19(C)]

****see attached for legislatively correct changes****

Sections 445.19(B), 445.19(C)

(B) Remote Emergency Shutdown.

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 445.19(A)(1) and (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 be labeled 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

File Name	Description	Approved
70_CMP_13_445.19BC_FR_7571.docx		
70_CMP_13_445.19BC_FR_7571.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Mon Jan 15 13:49:58 EST 2024

Committee Statement

Committee Statement: The revision complies with the NEC Style Manual section 3.5.1.2. In addition, editorial changes were made to device names for consistent callouts.

The reference to 445.19(A)(1) and (A)(2) addresses the shutdown of the prime mover.

By referring to a shutdown device instead of an emergency stop switch, the requirement is more inclusive of various other accepted methods and technologies.

Regarding Public Input 4138, the requirement of an emergency shutdown device permitted on the exterior of the generator was retained due to the lack of substantiation for its removal.

Response Message: FR-7571-NFPA 70-2024

Public Input No. 4138-NFPA 70-2023 [Section No. 445.19(C)]

Public Input No. 1837-NFPA 70-2023 [Section No. 445.19(B)]

Public Input No. 1838-NFPA 70-2023 [Section No. 445.19(C)]

Public Input No. 4137-NFPA 70-2023 [Section No. 445.19(B)]

70 CMP 13, 455.19(B)(C), FR 7571

(B) Remote Emergency Shutdown.
For other than one- and two-family dwelling units, generators with greater than 15 kW rating shall be provided with a remote ~~emergency stop~~shutdown device ~~switch to shut down the prime mover~~. The remote shutdown ~~emergency stop~~ device ~~switch~~ shall comply with all of the following:

1. B~~b~~e located outside the equipment room or mounted on the exterior of the generator enclosure.
2. Be at a readily accessible location.
3. Be marked as the Generator Emergency Shutdown, and ~~shall also~~ meet the requirements of 110.21(B).
4. Meet the requirements of 445.19(A)(1) and (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 be labeled 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 comply with all of the following:

1. B~~b~~e located outside the dwelling unit.
2. Be at a readily accessible location.
3. Be marked as the Generator Emergency Shutdown, and meet the requirements of 110.21(B).
4. ~~and shall also m~~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 445.19(C)(1).~~this section~~. ~~The shutdown device shall be marked as the Generator Emergency Shutdown, and the label shall meet the requirements of 110.21(B)).~~

First Revision No. 7585-NFPA 70-2024 [Section No. 455.3]

455.3 ~~Other Articles.~~

~~Phase converters shall comply with this article and with the applicable provisions of other articles of this *Code* .~~

Reconditioned Equipment

Reconditioned Phase Converters shall not be installed.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-7585_455.3.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 15:01:31 EST 2024

Committee Statement

Committee Statement: Phase converters are added as reconditioned equipment that shall not be installed based on safety concerns associated with the reconditioning. The NEMA Technical Position on Reconditioned Equipment (NEMA CS 100-2020, Appendix B.1) indicates phase converters shall not be permitted to be reconditioned and there is a lack of established safety requirements for reconditioning phase converters.

The section "Other Articles" is being removed as it is redundant and the other parts of the NEC are already applicable and do not need to be restated. The requirement should also be removed for compliance with the NEC Style Manual 4.1.1

Response Message: FR-7585-NFPA 70-2024

Public Input No. 629-NFPA 70-2023 [New Section after 455.1]

Public Input No. 3753-NFPA 70-2023 [Section No. 455.3]

455.3 ~~Other Articles~~Reconditioned Equipment.
~~Phase~~ Reconditioned phase converters shall ~~comply with this article and with the applicable provisions of other articles of this *Code*~~not be installed.

First Revision No. 8132-NFPA 70-2024 [Section No. 480.1]

see attached for legislatively correct changes

480.1 Scope.

This article applies to all installations of stationary standby batteries having a capacity greater than 3.6 MJ (1 kWh).

Informational Note No. 1: See Article 706 for installations that do not meet the definition of stationary standby batteries.

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*

Supplemental Information

File Name	Description	Approved
70_CMP_13_480.1_FR_8132.docx		
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Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 14:52:05 EST 2024

Committee Statement

Committee Statement:	The term standby is removed to clarify the requirements are applicable to all battery installations. Informational note 1 clarifies that article 480 will apply to all stationary battery installations that are not listed energy storage systems. Informational note 2 was added to be consistent with article 706. In informational note 3, references were updated and additional standards included.
Response Message:	FR-8132-NFPA 70-2024

Public Input No. 3820-NFPA 70-2023 [Section No. 480.1]

70 CMP 13 480.1 FR 8132

480.1 Scope.
This article applies to all installations of stationary ~~standby~~ batteries having a capacity greater than 3.6 MJ (1 kWh).
Informational Note No. 1: See Article 706 for ~~installations that do not meet the definition of stationary standby batteries~~ listed energy storage systems.
Informational Note No. 2: For batteries rated in ampere hours, kWh is equal to the nominal rated voltage times ampere-hour rating divided by 1000. For batteries rated in watts per cell, kWh equals the nameplate watts per cell multiplied by the number of cells divided by 1000 and multiplied by the nameplate minutes rating divided by 60.
Informational Note No. 3~~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~~1115, *Recommended Practice for ~~Installation and Maintenance~~Sizing of Nickel-Cadmium Batteries for ~~Photovoltaic (PV) Systems~~ Stationary Applications*
(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, and Motive ~~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~~ or Repurpos~~inged~~ Batteries*
(12) NFPA 855~~-2020~~, *Standard for the Installation of Stationary Energy Storage Systems*
(13) IEEE 1184, *Guide for Batteries for Uninterruptible Power Supply Systems*
(14) ICC IFC, *International Fire Code* (IFC)
(15) NFPA 1, *Fire Code*
(16) IEEE 1106, *Recommended Practice for Installation, Maintenance, Testing, and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications*
(17) IEEE 2962, *Recommended Practice for Installation, Operation, Maintenance, Testing, and Replacement of Lithium-ion Batteries for Stationary Applications*
(18) UL 9540, *Energy Storage Systems (ESS) and Equipment*
(19) UL 9540A, *Battery Energy Storage System (ESS) Test Method*

First Revision No. 7808-NFPA 70-2024 [Section No. 480.3]

480.3 ~~Equipment.~~

~~Storage~~

2 Listing Requirements

Stationary batteries and battery management equipment shall be listed. This requirement shall not apply to lead-acid batteries.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-7808_480.3.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 10:24:50 EST 2024

Committee Statement

Committee Statement: Moved listing to .2, consistent with NEC Style Manual. Modified storage to stationary to reflect the title change.

Response Message: FR-7808-NFPA 70-2024

Public Input No. 4319-NFPA 70-2023 [Section No. 480.3]

Public Input No. 3780-NFPA 70-2023 [Section No. 480.3]

480.3 ~~Equipment~~Listing Requirements. [Renumber as 480.2]
~~Storage~~ Stationary batteries and battery management equipment shall be listed. This requirement shall not apply to lead-acid batteries.

First Revision No. 7811-NFPA 70-2024 [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's installation and instruction manual~~

for Batteries with Acidic or Caustic Electrolyte .

Connections to and within a battery shall be assembled using an approved corrosion inhibitor in accordance with the battery manufacturer's instructions as outlined in the installation and operation documentation .

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-7811_480.4_A_.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 10:29:12 EST 2024

Committee Statement

Committee Statement: This section was intended for legacy lead-acid and nickel-cadmium batteries and the changes were to make this clear. The last sentence was redundant information and was deleted.

Response Message: FR-7811-NFPA 70-2024

Public Input No. 3835-NFPA 70-2023 [Section No. 480.4(A)]

(A) Corrosion Prevention for Batteries with Acidic or Caustic Electrolyte.
Connections to and within a battery shall be assembled using an approved corrosion inhibitor in accordance with the battery manufacturer's instructions as outlined in the installation and operation documentation~~Where mating dissimilar metals, antioxidant material suitable for the battery connection shall be used where recommended by the battery manufacturer's installation and instruction manual~~.

First Revision No. 7818-NFPA 70-2024 [Section No. 480.4(B)]

(B) Intercell and Intertier Conductors and Connections.

The ampacity of field-assembled intercell and intertier connectors and conductors shall be of such cross-sectional area that the temperature rise under maximum load conditions and at maximum ambient temperature shall not exceed the safe operating temperature of the conductor insulation or of the material of the conductor supports.

Informational Note No. 1: See IEEE 1184-2022, *IEEE Guide for Batteries for Uninterruptible Power Supply Systems*, Annex L for information on conductors used for non-continuous applications.

Informational Note No. 2: Conductors sized to prevent a voltage drop exceeding 3 percent of maximum anticipated load, and where the maximum total voltage drop to the furthest point of connection does not exceed 5 percent, may not be appropriate for all battery applications. IEEE 1375-2003, *Guide for the Protection of Stationary Battery Systems,* provides guidance for overcurrent protection and associated cable sizing.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 10:41:54 EST 2024

Committee Statement

Committee Statement: A new informational note reference gives guidance on conductors used for non-continuous applications.

Response Message: FR-7818-NFPA 70-2024

Public Input No. 3838-NFPA 70-2023 [Section No. 480.4(B)]

First Revision No. 7812-NFPA 70-2024 [Section No. 480.7(A)]

(A) Disconnecting Means.

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

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

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Wed Jan 17 10:32:57 EST 2024

Committee Statement

Committee Statement: The term standby is removed to match the title of the article.
Response Message: FR-7812-NFPA 70-2024

Public Input No. 3840-NFPA 70-2023 [Section No. 480.7(A)]

First Revision No. 7840-NFPA 70-2024 [Section No. 480.7(B)]

(B) Emergency Disconnect.

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

EMERGENCY DISCONNECT

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Wed Jan 17 12:13:43 EST 2024

Committee Statement

Committee Statement: The term standby is removed to match the title of the article.
Response Message: FR-7840-NFPA 70-2024

First Revision No. 7814-NFPA 70-2024 [Section No. 480.7(C)]

(C) Disconnection of Series Battery Circuits.

Battery circuits exceeding 240 volts dc nominal between conductors or to ground and subject to field servicing 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.~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 10:35:34 EST 2024

Committee Statement

Committee Statement: The use of non-load break bolted or plug-in disconnects may cause additional hazards when they are disconnected. Also, they may not provide consistent connectivity under high loads. The informational note was not added as it would not comply with the NEC Style Manual.

Response Message: FR-7814-NFPA 70-2024

Public Input No. 3841-NFPA 70-2023 [Section No. 480.7(C)]

First Revision No. 7815-NFPA 70-2024 [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, the disconnecting means shall be ~~capable of being locked in the open position,~~ lockable open 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: Wed Jan 17 10:38:18 EST 2024

Committee Statement

Committee Statement: The wording was changed to be consistent with other parts of the code. The term standby is removed to match the title of the article.

Response Message: FR-7815-NFPA 70-2024

Public Input No. 2540-NFPA 70-2023 [Section No. 480.7(D)]

Public Input No. 3844-NFPA 70-2023 [Section No. 480.7(D)]

First Revision No. 7820-NFPA 70-2024 [Section No. 480.7(E)]

(E) Busway.

Where a dc busway system is installed, the disconnecting means shall be permitted to be incorporated ~~into~~ as part of the busway system .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 10:45:01 EST 2024

Committee Statement

Committee Statement: The existing wording indicates that a disconnect can be installed into the busway but the intention is to allow disconnects to be attached to the busway and the wording has been changed to reflect this.

Response Message: FR-7820-NFPA 70-2024

Public Input No. 3845-NFPA 70-2023 [Section No. 480.7(E)]

First Revision No. 7830-NFPA 70-2024 [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

Informational Note No. 1: Battery equipment suppliers can provide information about available fault current on specific battery models.

(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, 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.~~ installations where the battery voltages are below 150 volts dc..

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 11:16:06 EST 2024

Committee Statement

Committee Statement: Arc flash is not a viable option for 150 Vdc or less battery strings whether installed indoors or outdoors. This revision will negate the need to specify an exclusion just for 1- or 2-family dwellings. Reference NFPA 70E Table 130.7(C)(15)(b), only for voltages above 150 volts dc.

The term standby is removed to match the title of the article.

Response Message: FR-7830-NFPA 70-2024

Public Input No. 3846-NFPA 70-2023 [Section No. 480.7(F)]

First Revision No. 7823-NFPA 70-2024 [Section No. 480.7(G)(1)]

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

Plaques or directories shall be installed in accordance with 705.10.

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

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 10:51:23 EST 2024

Committee Statement

Committee Statement: The term standby is removed to match the title of the article.

Response Message: FR-7823-NFPA 70-2024

Public Input No. 3849-NFPA 70-2023 [Section No. 480.7(G)(1)]

First Revision No. 7822-NFPA 70-2024 [Section No. 480.7(G) [Excluding any Sub-Sections]]

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

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Wed Jan 17 10:49:14 EST 2024

Committee Statement

Committee Statement: The term standby is removed to match the title of the article.
Response Message: FR-7822-NFPA 70-2024

Public Input No. 3848-NFPA 70-2023 [Section No. 480.7(G) [Excluding any Sub-Sections]]

First Revision No. 7832-NFPA 70-2024 [Section No. 480.8]

see attached for legislatively correct changes

480.8 ~~Insulation of Batteries.~~

~~Batteries constructed of an electrically conductive container shall have insulating support if a voltage is present between the container and ground~~

8 Grounding of Battery Stands and Conductive Cases.

Battery systems shall be required to ground conductive battery stands, racks, or cabinets and bond any conductive cases in accordance with Article 250, Part VIII .

Supplemental Information

File Name	Description	Approved
70_CMP_13_480.8_FR_7832.docx		
NEC_CMP13_FR-7832_480.8.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 11:20:42 EST 2024

Committee Statement

Committee Statement: Language was changed to more accurately refer to components of a stationary battery that should be bonded and grounded.

Grounding of battery stands and conductive cases is important and words were added to address this issue.

Response Message: FR-7832-NFPA 70-2024

Public Input No. 3850-NFPA 70-2023 [Section No. 480.8]

70 CMP 13 480.8 FR 7832

480.8 Grounding of Battery Stands and Conductive Cases.~~Insulation of Batteries~~.
~~For b~~Battery systems ~~greater than 100 Vdc, it is~~shall be required to ground conductive battery stands, racks, or cabinets and bond any conductive cases in accordance with Article 250, Part VIII. ~~Batteries constructed of an electrically conductive container shall have insulating support if a voltage is present between the container and ground.~~

First Revision No. 8135-NFPA 70-2024 [Section No. 480.10(A)]

see attached foir legislatively correct changes

(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 1-2021, *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: 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.

Supplemental Information

File Name	Description	Approved
70_CMP_13_480.10A_FR_8135.docx		
70_CMP_13_480.10A_FR_8135.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 14:56:22 EST 2024

Committee Statement

Committee Statement: Informational Note No. 1 is updated to reflect the appropriate reference to the applicable standard and No. 3 is a reference update.

Response Message: FR-8135-NFPA 70-2024

Public Input No. 3851-NFPA 70-2023 [Section No. 480.10(A)]

70 CMP 13 480.10(A) FR 8135

(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 2021, *Fire Code*, Chapter 52~~855 Standard for the Installation of Stationary Energy Storage Systems, for ventilation considerations for specific battery chemistries~~. which refers to the battery requirements for NFPA 855 and the IFC 2024 (Section 1207).~~
Informational Note No. 2: Some battery technologies do not require ventilation.
Informational Note No. 3: See IEEE/ASHRAE 1635-2018~~IEEE Std 1635-2012/ASHRAE Guideline 21-2012~~, *IEEE/ASHRAE Guide for the Ventilation and Thermal Management of Batteries for Stationary Applications*~~*Guide for the Ventilation and Thermal Management of Batteries for Stationary Applications*~~, for additional information on the ventilation of stationary battery systems.

First Revision No. 7836-NFPA 70-2024 [Section No. 480.10(C)]

(C) Spaces About Stationary ~~Standby~~ Batteries.

Spaces about 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: Wed Jan 17 11:30:33 EST 2024

Committee Statement

Committee Statement: The term standby is removed to match the title of the article.

Response Message: FR-7836-NFPA 70-2024

Public Input No. 3853-NFPA 70-2023 [Section No. 480.10(C)]

First Revision No. 8138-NFPA 70-2024 [Section No. 480.12]

480.12 Battery Interconnections.

Flexible cables ~~, as identified in~~ ~~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 of use and location . 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: Fri Jan 19 15:00:32 EST 2024

Committee Statement

Committee Statement: Table 400.4 is not applicable because there is no category for battery cables. The requirements of this section should apply whether the battery resides in an enclosure or in open air. The words ‘for the conditions of use and location’ were used for consistency with 400.3 Suitability.

Response Message: FR-8138-NFPA 70-2024

Public Input No. 3857-NFPA 70-2023 [Section No. 480.12]

First Revision No. 8139-NFPA 70-2024 [New Section after 480.13]

480.14 Overcharge Control.

Provisions shall be provided to prevent batteries from becoming overcharged.

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 15:02:43 EST 2024

Committee Statement

Committee Statement: Batteries require protections from overcharge to prevent hazards. Such provisions are not currently addressed in Article 480.
Response Message: FR-8139-NFPA 70-2024

First Revision No. 8142-NFPA 70-2024 [Section No. 480.13]

480.13 Ground-Fault Detection.

Battery circuits exceeding 100 volts between the conductors or to ground shall be permitted to operate with ungrounded or impeded grounded conductors, provided a ground-fault detector and indicator is installed to monitor for ground faults.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 15:04:23 EST 2024

Committee Statement

Committee Statement: Most ungrounded systems are actually impedance grounded. This revision correlates with 250.187.

Response Message: FR-8142-NFPA 70-2024

Public Input No. 3858-NFPA 70-2023 [Section No. 480.13]

First Revision No. 7608-NFPA 70-2024 [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: See Article 430 for the installation of pressure maintenance (jockey or makeup) pumps supplied by the fire pump circuit or another source.~~

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

Informational Note No. ~~2~~ 1 : See NFPA 20-~~2019~~ 2022 , *Standard for the Installation of Stationary Pumps for Fire Protection* , for further information.

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

Informational Note No. ~~3~~ 2 : See NFPA 13D-~~2019~~ 2022 , *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes* , for further information.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-7608_695.1_B_.docx		

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Mon Jan 15 16:31:35 EST 2024

Committee Statement

Committee Informational Note No. 1 is removed as it is considered redundant and not in

Statement:	accordance with 4.1.1 of the NEC Style Manual. Note that (B) addresses what is not covered by 695, so an informational note detailing what is covered causes confusion. References to NFPA 20 and NFPA 13D are updated.
Response Message:	FR-7608-NFPA 70-2024

Public Input No. 3325-NFPA 70-2023 [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: See Article 430 for the installation of pressure maintenance (jockey or makeup) pumps supplied by the fire pump circuit or another source.~~

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

   Informational Note No. ~~2~~ 1: See NFPA 20-~~2019~~2022, *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~~ 2: See NFPA 13D-~~2019~~2022, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, for further information.

First Revision No. 7614-NFPA 70-2024 [Section No. 695.2]

695.~~2~~ 3 Reconditioned Equipment.

Reconditioned fire pump controllers and transfer switches shall not be ~~permitted~~ installed .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 16:56:38 EST 2024

Committee Statement

Committee Statement: The text is revised to comply with the NEC Style Manual Section 2.2.1 regarding reconditioned equipment.

Response Message: FR-7614-NFPA 70-2024

Public Input No. 2615-NFPA 70-2023 [Section No. 695.2]

First Revision No. 7598-NFPA 70-2024 [Section No. 695.6(A)(1)]

(1) Services and On-Site Power Production Facilities.

Service conductors and conductors supplied by on-site power production facilities shall be physically routed outside a building(s) and shall be installed as service-entrance conductors in accordance with 230.6, 230.9, and Article 230 Parts III and IV ~~of Article 230~~ . Where supply conductors cannot be physically routed outside of buildings, the conductors shall be permitted to be routed through the building(s) where installed in accordance with 230.6(1) or (2).

Exception: The supply conductors within the fire pump room shall not be required to meet 230.6(1) or (2).

Informational Note: See 250.24(~~C~~ D) for routing the grounded conductor to the service equipment.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 16:01:00 EST 2024

Committee Statement

Committee Statement: This revision clarifies which parts of Article 230 are applicable, editorially changed per recommendation from the NEC Correlating Committee Usability Task Group. Additionally, the reference in the Informational Note is corrected from 250.24(C) to 250.24(D).

The proposed grounded conductors requirement is currently mandatory per 90.3, therefore it does not need to be added to the enforceable text.

There is insufficient technical substantiation provided that would indicate the proposed changes in PI 3381 would address the concussive forces on service conductors under fault conditions. It seems there is a practical challenge described in the submitter's statement, but the proposed changes do not reflect a resolution to the challenge.

Response Message: FR-7598-NFPA 70-2024

Public Input No. 2934-NFPA 70-2023 [Section No. 695.6(A)(1)]

Public Input No. 3381-NFPA 70-2023 [Section No. 695.6(A)(1)]

Public Input No. 1676-NFPA 70-2023 [New Section after 695.6(A)(1)]

First Revision No. 8063-NFPA 70-2024 [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 concrete with a minimum ~~50 mm (2 in.) of concrete. thickness of 127 mm (5 in.) measured from each point on the surface of the cable or raceway.~~

(5) ~~*Exception No. 1: Cables and raceways installed under ground shall not be considered to be inside the building.*~~

(6) ~~*Exception No. 2: Alternative thicknesses of concrete shall be permitted to be selected by a licensed professional engineer qualified in such design. The selection shall be documented and stamped by the professional engineer.*~~

~~Informational Note: See Fire Protection Research Foundation Report FPRF-2018-16 *Fire Resistance of Concrete for Electrical Conductors* for information about concrete fire resistance .~~

b. The cable or raceway is part of a listed fire-resistive cable system.

Informational Note No. 1: 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: 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.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8063_695.6_A_2_.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 10:23:44 EST 2024

Committee Statement

Committee Statement: Installations aboveground are likely to be directly exposed in the event of a fire, and analysis by the NFPA Fire Research Protection Foundation reported (Report number: FPRF-2018-16) that encasement in 2” of nearly every type of concrete would result in temperatures that are higher than normal building wire insulations could survive for the 2 hours that would be equivalent to the other permitted methods. To achieve sufficient protection in this type of installation, the report stated “… it is suggested that electrical feeders are to be encased in 5 inches of concrete when this is the method of fire protection. This is because at 5 inches all types of concrete, when properly casted, have a fire resistance rating of 2 or more hours. By making the requirement 5 inches you remove the need to specify the type of concrete to use.” While 2” could provide physical protection, it would not provide thermal protection for most types of concrete. An exception was added to clarify that conductors underground would not be considered inside the building. A second exception was added to recognize that a qualified engineer could use available data to design concrete protection that would provide equivalent thermal protection. An informational note was added to direct the code user to the Fire Protection Research Foundation report regarding fire resistance of concrete for electrical conductors.

Response Message: FR-8063-NFPA 70-2024

Public Input No. 3688-NFPA 70-2023 [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 concrete with a minimum ~~50-~~thickness of 127 mm (~~2-~~5 in.) ~~of concrete~~measured from each point on the surface of the cable or raceway.

Exception No. 1: Cables and raceways installed underground shall not be considered to be inside the building.

Exception No. 2: Alternative thicknesses of concrete shall be permitted to be selected by a licensed professional engineer qualified in such design. The selection shall be documented and stamped by the professional engineer.

Informational Note: See Fire Protection Research Foundation Report FPRF-2018-16, *Fire Resistance of Concrete for Electrical Conductors*, for information about concrete fire resistance.

b. The cable or raceway is part of a listed fire-resistive cable system.

Informational Note No. 1: 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: 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.

First Revision No. 7636-NFPA 70-2024 [Section No. 695.6(B)(2)]

(2) Fire Pump Motors Only.

Conductors supplying only ~~a~~ fire pump ~~motor~~ motors shall have a minimum ampacity in accordance with Article 430 ~~.22~~ Part II and shall comply with the voltage drop requirements in 695.7.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 08:21:20 EST 2024

Committee Statement

Committee Statement: Changing the percentage from 125% to 100% will remove the safety factor that it provides. It is possible to have more than one fire pump, so the text is updated to reflect this. The reference is changed to 430 Part II to be more inclusive.

Response Message: FR-7636-NFPA 70-2024

Public Input No. 973-NFPA 70-2023 [Section No. 695.6(B)]

First Revision No. 7589-NFPA 70-2024 [Section No. 695.10]

695.10 ~~Listed Equipment~~ 2 Listing Requirements .

Diesel engine fire pump controllers, electric fire pump controllers, electric motors, fire pump power transfer switches, foam pump controllers, and limited service controllers shall be listed for fire pump service. [**20:**9.5.1.1, 10.1.2.1, 12.1.3.1]

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 15:24:12 EST 2024

Committee Statement

Committee Statement: The committee agreed with the changes proposed by the NEC Correlating Committee Usability Task Group. Moved Listed Equipment requirements from “695.10” to “695.2” change “Listed Equipment” to “Listing Requirements” to comply with the NEC style manual (2.2.1)

Moved “Reconditioned Equipment” to “695.3” and increased the numbering for each section (695.2 to 695.7) by 1 to accommodate above changes

Response Message: FR-7589-NFPA 70-2024

Public Input No. 2818-NFPA 70-2023 [New Section after 695.1]

Public Input No. 2819-NFPA 70-2023 [Section No. 695.10]

First Revision No. 7612-NFPA 70-2024 [Section No. 695.12(C)]

(C) ~~Storage~~ Stationary Standby Batteries.

~~Storage~~ Stationary standby batteries for fire pump engine drives shall be supported above the floor, secured against displacement, and located where they are not subject to physical damage, flooding with water, excessive temperature, or excessive vibration.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Mon Jan 15 16:47:11 EST 2024

Committee Statement

Committee Statement: The word “stationary” is added to reflect the specific application of these batteries. Changing “storage” to “standby” aligns with a defined term (Articles 100 and 480).

Response Message: FR-7612-NFPA 70-2024

Public Input No. 569-NFPA 70-2023 [Section No. 695.12(C)]

First Revision No. 8065-NFPA 70-2024 [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*, 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 concrete with a minimum ~~50 mm (2 in.) of concrete. thickness of 127 mm (5 in.) measured from each point on teh surface of the cable or raceway.~~

(2)

~~*Exception No. 1: Cables and raceways installed under ground shall not be considered to be inside the building.*~~

~~*Exception No. 2: Alternative thicknesses of concrete shall be permitted to be selected by a licensed professional engineer qualified in such design. The selection shall be documented and stamped by the professional engineer.*~~

~~Informational Note: See F ire Protection Research Foundation Report FPRF-2018-16 *Fire Resistance of Concrete for Electrical Conductors* for information about concrete fire resistance .~~

(3) The cable or raceway is part of a listed fire-resistive cable system.

Informational Note No. 1: 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.

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

Informational Note No. 3: See UL 1724, *Fire Tests for Electrical Circuit Protection Systems*, for testing requirements for circuit protective 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: Fri Jan 19 10:30:58 EST 2024

Committee Statement

Committee Statement: Installations aboveground are likely to be directly exposed in the event of a fire, and analysis by the NFPA Fire Research Protection Foundation reported (Report number: FPRF-2018-16) that encasement in 2” of nearly every type of concrete would result in temperatures that are higher than normal building wire insulations could survive for the 2 hours that would be equivalent to the other permitted methods. To achieve sufficient protection in this type of installation, the report stated “… it is suggested that electrical feeders are to be encased in 5 inches of concrete when this is the method of fire protection. This is because at 5 inches all types of concrete, when properly casted, have a fire resistance rating of 2 or more hours. By making the requirement 5 inches you remove the need to specify the type of concrete to use.” While 2” could provide physical protection, it would not provide thermal protection for most types of concrete. An exception was added to clarify that conductors underground would not be considered inside the building. A second exception was added to recognize that a qualified engineer could use available data to design concrete protection that would provide equivalent thermal protection. An informational note was added to direct the code user to the Fire Protection Research Foundation report regarding fire resistance of concrete for electrical conductors.

Response Message: FR-8065-NFPA 70-2024

Public Input No. 3697-NFPA 70-2023 [Section No. 695.14(F)]

First Revision No. 7658-NFPA 70-2024 [Section No. 700.2]

700. ~~2~~ **3** Reconditioned Equipment.

Reconditioned transfer switches shall not ~~be permitted~~ be installed .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 09:51:10 EST 2024

Committee Statement

Committee Statement: The change was made in accordance with section 2.2.1 of the NEC Style Manual.

Response Message: FR-7658-NFPA 70-2024

Public Input No. 2616-NFPA 70-2023 [Section No. 700.2]

First Revision No. 7672-NFPA 70-2024 [Section No. 700.3(C)]

(C) ~~Maintenance~~ Servicing .

Emergency system equipment shall be maintained in accordance with manufacturer instructions and industry standards.

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Tue Jan 16 10:30:44 EST 2024

Committee Statement

Committee Statement: The definition of servicing is inclusive of maintenance.
Response Message: FR-7672-NFPA 70-2024

First Revision No. 7675-NFPA 70-2024 [Section No. 700.3(D)]

(D) ~~Written~~ Record Keeping .

A written record shall be kept of such tests and maintenance and made available to those authorized to design, install, inspect, maintain, and operate the system .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 10:34:02 EST 2024

Committee Statement

Committee Statement: The additional language of the availability of written records will provide correlation with other parts of the NEC that have performance testing or commissioning requirements and will provide additional useability.

Written records are understood to be inclusive of digital records.

Response Message: FR-7675-NFPA 70-2024

Public Input No. 2291-NFPA 70-2023 [Section No. 700.3(D)]

Public Input No. 2496-NFPA 70-2023 [Section No. 700.3(D)]

First Revision No. 7676-NFPA 70-2024 [Section No. 700.3(F)]

(F) Temporary Source of Power for ~~Maintenance or Repair~~ Servicing 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~~ servicing , the emergency system shall include permanent switching means to connect a portable or temporary alternate source of power that shall be available for the duration of the ~~maintenance or repair~~ servicing . 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) 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.

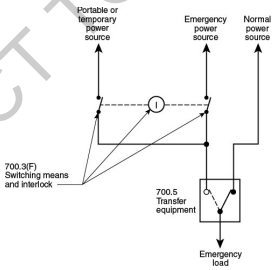
(8) The installation of a portable or temporary power source shall include an overcurrent protective device (OCPD) to provide equivalent protection for the emerg ency system and at a minimum, provide sufficient power to emergency and other selected loads served.

(9) Section 700.10(D)(4)(2) shall not apply.

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

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

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.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 10:49:57 EST 2024

Committee Statement

Committee Statement: The committee agrees with the concept of the submitter's PI to provide proper overcurrent protection of the system as originally designed when connected to a portable or temporary source. The addition of paragraph (F)(9) helps to clarify that Article 700.10, as a whole, applies to the feeder between the emergency system and the permanent switching means. At the same time, it excludes the requirements for monitoring the start circuit at the temporary generator, as that may not always be possible, and is dependent on the temporary generator that shows up when needed.

The definition of servicing is inclusive of maintenance and repair. This change will provide clarity.

Response Message: FR-7676-NFPA 70-2024

Public Input No. 1329-NFPA 70-2023 [Section No. 700.3]

Public Input No. 3720-NFPA 70-2023 [Section No. 700.3(F)]

First Revision No. 7679-NFPA 70-2024 [Section No. 700.4]

see attached for legislatively correct changes

700.4 Capacity and Rating.

(A) Capacity.

An emergency system shall have adequate capacity in accordance with Parts I through IV of 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.

(B) Selective Load Management.

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 load management (that includes automatic selective load pickup and load shedding) is provided as needed to ensure adequate power to the following in order of priority:

(1) Emergency circuits

(2) Legally required standby circuits

(3) Optional standby circuits

(C) Parallel Operation.

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

Supplemental Information

File Name	Description	Approved
70_CMP_13_700.4_FR_7679.docx		
70_CMP_13_700.4_FR_7679.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 10:57:58 EST 2024

Committee Statement

Committee Statement: The changes were made in accordance with section 4.1.4 of the NEC Style Manual.

The change in (A)was made to create correlation and formatting with section 701.4. The emergency equipment needs to be suitable for the available fault current at its application.

Response Message: FR-7679-NFPA 70-2024

Public Input No. 206-NFPA 70-2023 [Section No. 700.4(A)]

Public Input No. 2935-NFPA 70-2023 [Section No. 700.4]

70 CMP 13 700.4 FR 7679

700.4 Capacity and Rating.

(A) Rating. The emergency system equipment shall be suitable for the available fault current at its terminals.

(B~~A~~) Capacity.
An emergency system shall have adequate capacity in accordance with Article 220, Parts I through IV ~~of 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.

(B) Selective Load Management.
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 load management (that includes automatic selective load pickup and load shedding) is provided as needed to ensure adequate power to the following in order of priority:

(1) Emergency circuits
(2) Legally required standby circuits
(3) Optional standby circuits

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

(1) Normal Source.
The emergency source shall be permitted to operate in parallel with the normal source in compliance with Article 705 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.

First Revision No. 7681-NFPA 70-2024 [Section No. 700.5]

see attached for legislatively correct changes

700.5 Transfer Equipment.

(A) General.

Transfer equipment shall be automatic, listed, and marked for emergency use. 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.

(B) Bypass Isolation Transfer Switches.

Means shall be permitted to bypass and isolate the transfer equipment. Where bypass isolation transfer switches are used, inadvertent parallel operation shall be prevented.

(C) Automatic Transfer Switches.

Automatic transfer switches shall be electrically operated and mechanically held.

(D) Redundant Transfer Equipment.

If emergency loads are supplied by a single feeder, the emergency power system shall include redundant transfer equipment or a bypass isolation transfer switch to facilitate maintenance as required in 700.3(C) without jeopardizing continuity of power. If the redundant transfer equipment or bypass isolation transfer switch is manual (or nonautomatic), then it shall be actively supervised by a qualified person when the primary (automatic) transfer equipment is disabled for maintenance or repair.

Exception: The requirement for redundancy with the transfer equipment shall not apply where any of the following conditions exist:

(1) All processes that rely on the emergency system source are capable of being disabled during maintenance or repair activities without jeopardizing the safety to human life.

(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 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.

(E) 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.

(F) Documentation.

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.

Supplemental Information

File Name	Description	Approved
70_CMP_13_700.5_FR_7981.docx		
70_CMP_13_700.5_FR_7681.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 11:06:23 EST 2024

Committee Statement

Committee Statement: The proposed modifications are added and reformatted to provide clarity and useability. Sub-section (B) is deleted and relevant parts are moved into new part (C) to permit use of bypass isolation switch. The term repair is deleted and changed to servicing and maintenance to correlate with section 110.17. The change is in accordance with NEC Style Manual section 4.1.4. The word transfer is removed to align the term Bypass-Isolation Switch, which is defined in NFPA 110. This change provides clarity to prevent the inadvertent paralleling of multiple sources.

Response Message: FR-7681-NFPA 70-2024

Public Input No. 3327-NFPA 70-2023 [Section No. 700.5(A)]

Public Input No. 1330-NFPA 70-2023 [Section No. 700.5(D)]

Public Input No. 3288-NFPA 70-2023 [Section No. 700.5]

Public Input No. 1341-NFPA 70-2023 [Section No. 700.5(B)]

Public Input No. 3435-NFPA 70-2023 [Section No. 700.5(D)]

70 CMP 13 70.5 FR 7681

700.5 Transfer Equipment.

(A) General.

Transfer equipment shall be automatic, listed, and marked for emergency use. 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~~section 705.6. Meter-mounted transfer switches shall not be permitted for emergency system use.

~~**(B) Bypass Isolation Transfer Switches.**~~

~~Means shall be permitted to bypass and isolate the transfer equipment. Where bypass isolation transfer switches are used, inadvertent parallel operation shall be prevented.~~

(~~C~~B) Automatic Transfer Switches.

Automatic transfer switches shall be electrically operated and mechanically held.

(~~D~~C) Redundant Transfer Equipment.

If emergency loads are supplied by a single feeder, the emergency power system shall include redundant transfer equipment or a bypass isolation transfer switch to facilitate maintenance as required in 700.3(C) without jeopardizing continuity of power. If the redundant transfer equipment or bypass isolation ~~transfer~~ switch is manual (or nonautomatic), then it shall be actively supervised by a qualified person when the primary (automatic) transfer equipment is disabled for servicing and maintenance ~~or repair~~. When redundant transfer equipment is used a means shall be provided to disconnect the transfer switch from all supply side sources. Inadvertent parallel operation shall be prevented.

Exception: The requirement for redundancy with the transfer equipment shall not apply where any of the following conditions exist:

(1) All processes that rely on the emergency system source are capable of being disabled during servicing and maintenance ~~or repair~~ activities without jeopardizing the safety to human life.

(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 written emergency plan that includes mitigation actions and responsibilities for qualified persons to address the recognized site hazards for the duration of the servicing and maintenance or repair activities shall be developed and implemented. The emergency plan shall be made available to the authority having jurisdiction.

(~~E~~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.

(~~F~~E) Documentation.

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.

First Revision No. 7682-NFPA 70-2024 [Section No. 700.10(A)]

(A) 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 (~~including~~ such as transfer switches, interconnection equipment, generators, and power panels) for 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 or raceway systems shall be permanently marked to be identified as a component of an emergency circuit or system, at intervals not to exceed 7.6 m (25 ft).

Receptacles supplied from the emergency system shall have a distinctive color or marking on the receptacle cover plates or the receptacles.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 11:15:56 EST 2024

Committee Statement

Committee Statement: The term interconnection equipment was added to correlate with the permitted emergency sources in 700.12. The term “including” was changed to “such as” to improve useability.

Response Message: FR-7682-NFPA 70-2024

Public Input No. 3043-NFPA 70-2023 [Section No. 700.10(A)]

First Revision No. 7685-NFPA 70-2024 [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 the following:

(1) Wiring from the normal power source located in transfer or interconnection equipment enclosures

(2) Wiring supplied from two sources in exit or emergency luminaires

(3) Wiring from two sources in a listed automatic load control relay (ALCR) or listed emergency lighting control device (ELCD) 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 the following:

(7) 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.

(8) The common bus of separate sections of the switchgear, separate sections of the switchboard, or the individual enclosures shall be either of the following:

(9) Supplied by single or multiple feeders without overcurrent protection at the source

(10) 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: See Informational Note Figure 700.10(B)(1) and Informational Note Figure 700.10(B)(2) for further information.

Figure Informational Note Figure 700.10(B)(1) Single or Multiple Feeders Without Overcurrent Protection.

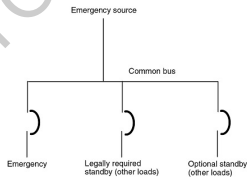
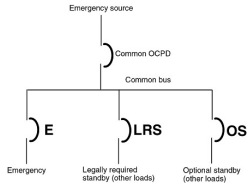


Figure Informational Note Figure 700.10(B)(2) Single or Multiple Feeders with Overcurrent Protection.



(11) Emergency circuits shall not originate from the same vertical switchgear section, vertical switchboard section, panelboard enclosure, or individual disconnect enclosure as other circuits.

(12) It shall be permissible to 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.

(13) At the emergency power source, such as a generator, multiple integral overcurrent protective devices shall each be permitted to supply a designated emergency or a designated nonemergency load, provided that there is complete separation between emergency and nonemergency loads beginning immediately after the overcurrent protective device line-side connections.

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

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-7685_700.10_B_.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 11:24:40 EST 2024

Committee Statement

Committee Statement: The revision incorporates TIA No. 20-18 for this requirement.

There is now a defined term for automatic load control relay (ALCR) and adding it to this section improves useability. There is also use of emergency lighting control device (ECLD) and that is a defined term and a device covered by section 700.10(B)(3). The term interconnection equipment was added to correlate with the permitted emergency sources in 700.12.

Response Message: FR-7685-NFPA 70-2024

Public Input No. 3045-NFPA 70-2023 [Section No. 700.10(B)]

Public Input No. 1608-NFPA 70-2023 [Section No. 700.10(B)]

Public Input No. 172-NFPA 70-2023 [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 the following:

1. Wiring from the normal power source located in transfer or interconnection equipment enclosures
2. Wiring supplied from two sources in exit or emergency luminaires
3. Wiring from two sources in a listed automatic load control relay (ALCR) or listed emergency lighting control device (ELCD) 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 the following:
    1. 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.
    2. The common bus of separate sections of the switchgear, separate sections of the switchboard, or the individual enclosures shall be either of the following:
        1. Supplied by single or multiple feeders without overcurrent protection at the source
        2. 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: See Informational Note Figure 700.10(B)(1) and Informational Note Figure 700.10(B)(2) for further information.

    Figure Informational Note Figure 700.10(B)(1) Single or Multiple Feeders Without Overcurrent Protection.

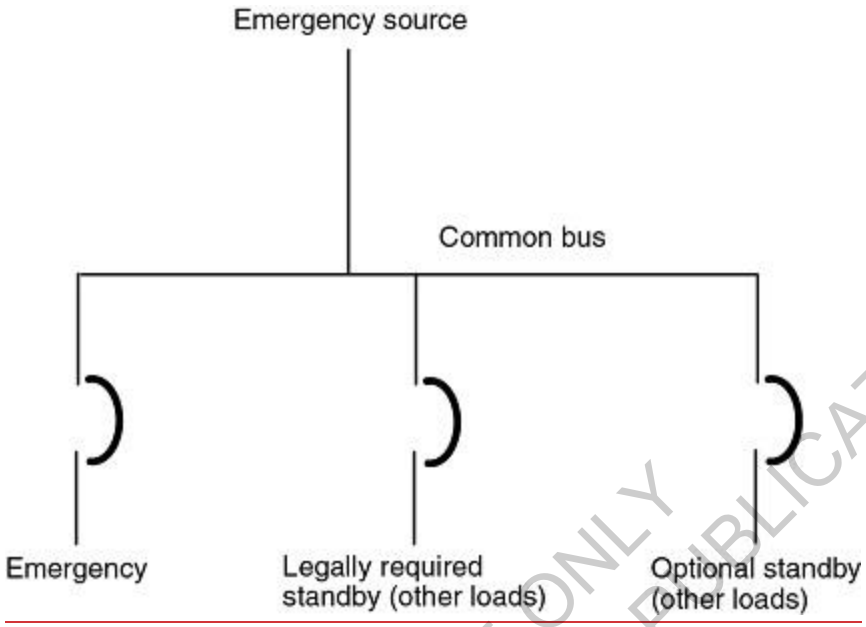
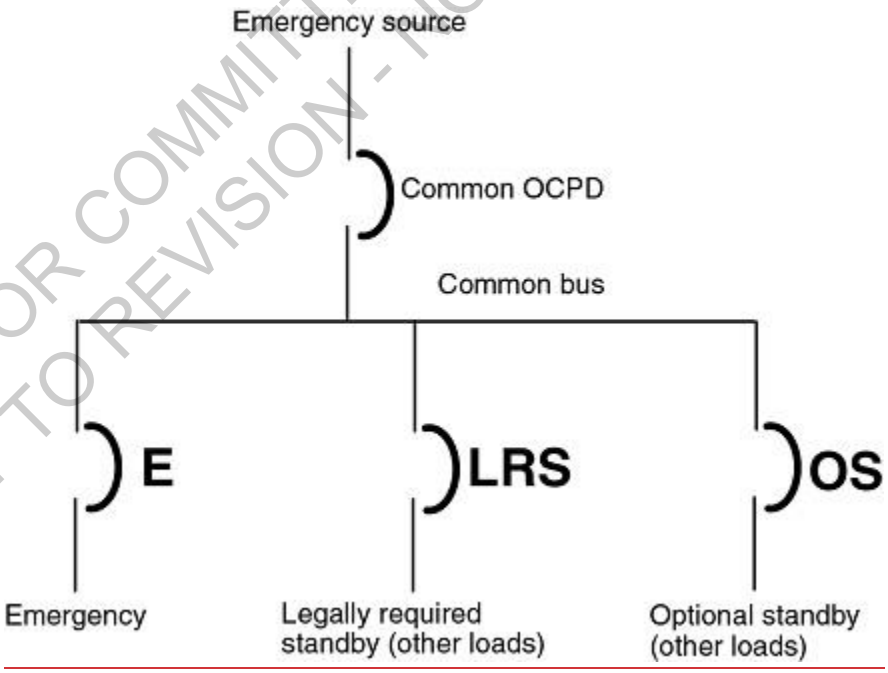


Figure Informational Note Figure 700.10(B)(2) Single or Multiple Feeders with Overcurrent Protection.



3. Emergency circuits shall not originate from the same vertical switchgear section, vertical switchboard section, panelboard enclosure, or individual disconnect enclosure as other circuits.

4. It shall be permissible to 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.
5. At the emergency power source, such as a generator, multiple integral overcurrent protective devices shall each be permitted to supply a designated emergency or a designated nonemergency load, provided that there is complete separation between emergency and nonemergency loads beginning immediately after the overcurrent protective device line-side connections.

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

First Revision No. 7688-NFPA 70-2024 [Section No. 700.10(D)(1)]

(1) Occupancies.

Emergency systems shall meet the additional requirements in 700.10(D)(2) through (D)(4) in the following occupancies:

(1) Assembly occupancies for not less than 1000 persons

(2) ~~Buildings above 23 m (75 ft) in height~~ A building where the floor of an occupiable story is gr eater than 23 m (75 ft) above the lowest level of fire department vehicle access.

(3) Educational occupancies with more than 300 occupants

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 11:32:00 EST 2024

Committee Statement

Committee Statement: Adding the definition of a high rise building into the requirement will remove the ambiguity and increase the enforceability. This correlates with the defined term in NFPA 5000.

Response Message: FR-7688-NFPA 70-2024

Public Input No. 441-NFPA 70-2023 [Section No. 700.10(D)(1)]

First Revision No. 8078-NFPA 70-2024 [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: 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.

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

Informational Note No. 2: 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.

(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) (5) The cable or raceway is encased in concrete with a minimum thickness of ~~50 mm~~ 127 mm (~~2 in~~ 5 in .) measured from each point on the surface of the cable or raceway.

Exception No. 1: Cables and raceways installed underground shall not be considered to be inside the building.

Exception No. 2: Alternative thicknesses of concrete shall be permitted to be selected by a licensed professional engineer qualified in such design. The selection shall be documented and stamped by the professional engineer.

Informational Note: See Fire Protection Research Foundation Report FPRF-2018-16 *Fire Resistance of Concrete for Electrical Conductors* for information about concrete fire resistance.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8078_700.10_D_2_.docx		

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 10:56:08 EST 2024

Committee Statement

Committee Statement: Installations aboveground are likely to be directly exposed in the event of a fire, and analysis by the NFPA Fire Research Protection Foundation reported (Report number: FPRF-2018-16) that encasement in 2" of nearly every type of concrete would result in temperatures that are higher than normal building wire insulations could survive for the 2 hours that would be equivalent to the other permitted methods. To achieve sufficient protection in this type of installation, the report stated "… it is suggested that electrical feeders are to be encased in 5 inches of concrete when this is the method of fire protection. This is because at 5 inches all types of concrete, when properly casted, have a fire resistance rating of 2 or more hours. By making the requirement 5 inches you remove the need to specify the type of concrete to use." While 2" could provide physical protection, it would not provide thermal protection for most types of concrete. An exception was added to clarify that conductors under ground would not be considered inside the building. A second exception was added to recognize that a qualified engineer could use available data to design concrete protection that would provide equivalent thermal protection. An informational note was added to direct the code user to the Fire Protection Research Foundation report regarding fire resistance of concrete for electrical conductors.

Response Message: FR-8078-NFPA 70-2024

Public Input No. 3707-NFPA 70-2023 [Section No. 700.10(D)(2)]

Public Input No. 2860-NFPA 70-2023 [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: 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.

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

   Informational Note No. 2: 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.

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 concrete with a minimum thickness of ~~50~~ 127 mm (~~2~~ 5 in.) measured from each point on the surface of ~~concrete.~~the cable or raceway.

Exception No. 1: Cables and raceways installed underground shall not be considered to be inside the building.

Exception No. 2: Alternative thicknesses of concrete shall be permitted to be selected by a licensed professional engineer qualified in such design. The selection shall be documented and stamped by the professional engineer.

Informational Note: See Fire Protection Research Foundation Report FPRF-2018-16, *Fire Resistance of Concrete for Electrical Conductors*, for information about concrete fire resistance.

First Revision No. 8173-NFPA 70-2024 [Section No. 700.10(D)(3)]

(3) Feeder-Circuit Equipment.

Equipment for feeder circuits (including transfer switches, interconnection equipment, transformers, and panelboards) shall be located either in spaces fully protected by an approved automatic fire protection system or in spaces with a 2-hour fire resistance rating.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:29:36 EST 2024

Committee Statement

Committee Statement: The term interconnection equipment is added to correlate with the permitted emergency sources in 700.12. This term aligns with the product safety requirements for emergency systems in UL 3008.

Response Message: FR-8173-NFPA 70-2024

Public Input No. 3046-NFPA 70-2023 [Section No. 700.10(D)(3)]

First Revision No. 8177-NFPA 70-2024 [Section No. 700.10(D)(4)]

(4) Source Control Wiring.

(1) Control conductors installed between the emergency power supply system/stored-energy power supply system (EPSS/SEPSS) and transfer equipment 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) .

(2) The integrity of source control wiring shall be monitored for broken, disconnected, or shorted wires. Loss of integrity shall result in the following actions:

(1) _ *(a) Generators*. Shall start the generator(s).

(2) _ *(b) All other sources*. Shall be considered a system malfunction and initiate the designated signal(s) in 700.6(A).

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8177_700.10_D_4_.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:40:51 EST 2024

Committee Statement

Committee Statement: The revision reformats section 700.10(D)(4) for improved clarity and useability.

Response Message: FR-8177-NFPA 70-2024

(4) Source Control Wiring. [Move text to (1) and (2)]

~~Control conductors installed between the emergency power supply system/stored-energy power supply system (EPSS/SEPSS) and transfer equipment 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 source control wiring shall be monitored for broken, disconnected, or shorted wires. Loss of integrity shall 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).~~

(1) Control conductors installed between the emergency power supply system/stored-energy power supply system (EPSS/SEPSS) and transfer equipment 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).

(2) The integrity of source control wiring shall be monitored for broken, disconnected, or shorted wires. Loss of integrity shall 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).

First Revision No. 7692-NFPA 70-2024 [Section No. 700.12(A)]

(A) Power Source ~~Considerations~~ Duration .

~~In selecting an emergency source of power, consideration shall be given to the occupancy and the type of service to be rendered~~ Power source duration shall be selected based upon the type of occupan c y.

Informational N ote : An example of considerations of duration of an emergency power source , whether of minimum duration, as for evacuation of a theater, or longer duration, as

~~for~~

f or supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building .

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-7692_700.12_A_.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 11:56:25 EST 2024

Committee Statement

Committee Statement: The title and section are changed and previous requirements are moved to an Informational Note to provide clarity and enforceability of the requirements that are needed in the design of the duration of a power source for an emergency system in specific types of occupancies.

Response Message: FR-7692-NFPA 70-2024

Public Input No. 2502-NFPA 70-2023 [Section No. 700.12(A)]

(A) Power Source ~~Considerations~~Duration.

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

Informational Note: An example of considerations of duration of an emergency power source, whether of minimum duration, as for evacuation of a theater, or longer duration, as for supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building.

First Revision No. 8176-NFPA 70-2024 [Section No. 700.12(D)(4)]

(4) Outdoor Generator Sets.

~~Where an~~ An outdoor-housed generator set ~~is~~ shall be equipped with a ~~readily accessible~~ disconnecting means in accordance with 445.18~~, and~~ . When the disconnecting means is not readily accessible or is not 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~~ supplied. 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.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:37:01 EST 2024

Committee Statement

Committee Statement: The revision improves clarity and useability of the requirement by putting it into positive text language.

Response Message: FR-8176-NFPA 70-2024

First Revision No. 7693-NFPA 70-2024 [Section No. 700.12(G)]

(G) Microgrid Systems.

On-site sources, designated as emergency sources, shall be permitted to be connected to a microgrid system.

The system shall include interconnection equipment listed for emergency use to isolate the emergency system from all nonemergency loads when the normal electric supply is interrupted or shall meet the requirements of 700.4(B). 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.

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 this article.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 12:02:22 EST 2024

Committee Statement

Committee Statement: The term interconnection equipment is added to correlate with the permitted emergency sources in 700.12. This term aligns with the product safety requirements for emergency systems in UL 3008.

Response Message: FR-7693-NFPA 70-2024

Public Input No. 3047-NFPA 70-2023 [Section No. 700.12(G)]

First Revision No. 8174-NFPA 70-2024 [Section No. 700.12 [Excluding any Sub-Sections]]

Current supply shall be such that, in the event of failure of the normal supply to, or within, the building or group of buildings concerned, emergency lighting, emergency power, or both shall be available within the time required for the application but not to exceed 10 seconds. The supply system for emergency purposes, in addition to the normal services to the building and meeting the general requirements of this section, shall be one or more of the types of systems described in 700.12(C) through (H). Unit equipment in accordance with 700.12(~~H~~ G) shall satisfy the applicable requirements of this article.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:35:16 EST 2024

Committee Statement

Committee Statement: The reference to part (H) is incorrect and should only reference to part (G). The part (H) is covered in the last sentence of the requirement as unit equipment.

Response Message: FR-8174-NFPA 70-2024

First Revision No. 7697-NFPA 70-2024 [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 is interconnected or will be transferred automatically upon the failure of the normal supply.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 13:03:15 EST 2024

Committee Statement

Committee Statement: The permitted emergency sources in 700.12 may utilize interconnection equipment to supply emergency power rather than perform a load transfer so the requirement was modified to be applicable in either situation.

Response Message: FR-7697-NFPA 70-2024

Public Input No. 3048-NFPA 70-2023 [Section No. 700.18]

First Revision No. 7699-NFPA 70-2024 [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 power 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 , Part II .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 13:05:23 EST 2024

Committee Statement

Committee Statement: Accepting the change to add reference to Article 700, Part II in accordance with the NEC Style Manual section 4.1.4.

Response Message: FR-7699-NFPA 70-2024

Public Input No. 2936-NFPA 70-2023 [Section No. 700.23]

First Revision No. 8178-NFPA 70-2024 [Section No. 700.24]

700.~~24~~ 24 Luminaires with Control Inputs that provide emergency illumination.
Luminaires with control inputs that provide emergency illumination shall comply with 700.24(A) or 700.24(B).

(A) Directly Controlled Emergency

~~Luminaires~~

Luminaire (DCEL).

~~Where emergency illumination is provided by one or more directly controlled emergency luminaires DCEL's that, upon loss of normal power, respond to an external active control signal on their control input from a listed ELCD to establish the required emergency illumination level, such directly controlled emergency luminaries DCEL's shall be listed for use in emergency systems.~~

~~Luminaires that are energized to the required emergency illumination level by~~

~~(B) Directly Controlled Luminaire (DCL)~~ ~~. Where emergency illumination is provided by one or more DCL's by disconnection of their control input by a listed emergency lighting control device ELCD upon loss of normal power, such DCL's shall not be required to be listed for use in emergency systems. If a DCL has configurable behavior for control input disconnec ti on, it shall be set to provide full luminaire output upon control input disconnec ti on.~~

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8178_700.24.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:44:20 EST 2024

Committee Statement

Committee Statement: The revision improves clarity and useability. The existing wording of 700.24 can be subject to misinterpretation because it covers a single device (directly controlled emergency luminaire) that can have two different listing requirements depending on the application and control system topology. In fact, two different device names are needed for clear differentiation of listing requirements: Directly Controlled Emergency Luminaire (DCEL) covered in 700.24(A), and Directly Controlled Luminaire (DCL) covered in 700.24(B). DCEL's must be listed for use in emergency systems, while DCL's do not require a listing for use in emergency systems. The majority of DCL's such as those that use 0-10V control, have a default behavior upon disconnection of their control input that causes the DCL to provide full output. However, some DCL's such as those using the DALI control protocol, may have configurable behavior when the control input is disconnected. This is the reason for the configurable behavior full-output mandate in 700.24(B).

Response Message: FR-8178-NFPA 70-2024

Public Input No. 1710-NFPA 70-2023 [Section No. 700.24]

700.24 ~~Directly Controlled Emergency~~ Luminaires with Control Inputs That Provide Emergency Illumination. [Move 1st line to (A)]

Luminaires with control inputs that provide emergency illumination shall comply with 700.24(A) or 700.24(B).~~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 to establish the required emergency illumination level, such directly controlled emergency luminaries 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.~~

(A) Directly Controlled Emergency Luminaire (DCEL).

Where emergency illumination is provided by one or more ~~directly controlled emergency luminaires~~DCEL's that, upon loss of normal power, respond to an external active control signal on their control input from a listed ELCD to establish the required emergency illumination level, such ~~directly controlled emergency luminaries~~DCEL's shall be listed for use in emergency systems.

(B) Directly Controlled Luminaire (DCL).

Where emergency illumination is provided by one or more DCL's by disconnection of their control input by a listed ELCD upon loss of normal power, such DCL's shall not be required to be listed for use in emergency systems. If a DCL has configurable behavior for control input disconnection, it shall be set to provide full luminaire output upon control input disconnection.

First Revision No. 8180-NFPA 70-2024 [Section No. 700.32(A)]

(A) General.

Emergency system(s) overcurrent protective devices (OCPDs) shall be selectively coordinated with all supply-side 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.

Informational Note: See *NECA 700, Standard for Installing Overcurrent Protection to Achieve Selective Coordination* for additional information on how to achieve selective coordination.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:52:57 EST 2024

Committee Statement

Committee Statement: The informational note was added to assist the user in ways to achieve selective coordination. The reference to other ANSI-approved installation standards was not included as it is too vague.

Response Message: FR-8180-NFPA 70-2024

Public Input No. 1674-NFPA 70-2023 [Section No. 700.32(A)]

First Revision No. 8182-NFPA 70-2024 [Section No. 700.32(B)]

(B) Replacements.

Where emergency system(s) OCPDs or normal system OCPDs that supply emergency load(s) are replaced, they shall be reevaluated to ensure selective coordination of the emergency system(s) is maintained with all supply-side and load-side OCPDs.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:57:23 EST 2024

Committee Statement

Committee Statement: The change was made to help ensure the safety and reliability of an emergency power system by adding clarity to what overcurrent protective devices shall be reevaluated when replacements are made.

Response Message: FR-8182-NFPA 70-2024

Public Input No. 4106-NFPA 70-2023 [Section No. 700.32(B)]

First Revision No. 8183-NFPA 70-2024 [Section No. 700.32(C)]

(C) Modifications.

If modifications, additions, or deletions to the emergency system(s) or the normal system supplying the emergency load(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~~(C)~~ for an example of how emergency system OCPDs selectively coordinate with all supply-side OCPDs.

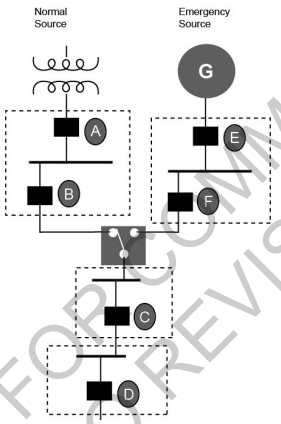
OCPD D selectively coordinates with OCPDs C, F, E, B, and A.

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(C) Emergency System Selective Coordination.



Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 16:58:42 EST 2024

Committee Statement

Committee Statement: The change provides clarity on maintaining selective coordination with the normal system and provides correlation with section 240.11.

Also, the revision reaffirms the language in TIA. 23-11. This change removes the reference to Part C in the Informational Note and Figure in 700.32

Response Message: FR-8183-NFPA 70-2024

Public Input No. 4109-NFPA 70-2023 [Section No. 700.32(C)]

Public Input No. 4541-NFPA 70-2023 [Global Input]

First Revision No. 7734-NFPA 70-2024 [Section No. 701.2]

701. ~~2~~ **3** Reconditioned Equipment.

Reconditioned transfer switches shall not ~~be permitted~~ be installed .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 15:35:22 EST 2024

Committee Statement

Committee Statement: The change was made in accordance with the NEC Style Manual section 2.2.1 for parallel numbering format of articles.

Response Message: FR-7734-NFPA 70-2024

Public Input No. 2617-NFPA 70-2023 [Section No. 701.2]

First Revision No. 7730-NFPA 70-2024 [Section No. 701.3]

see attached for legislativly correct changes

701.3 Commissioning and Maintenance.

(A) Commissioning Witness Test.

The authority having jurisdiction shall conduct or witness the commissioning of the complete system upon installation.

Informational Note: See NECA 90, *Standard for Commissioning Building Electrical Systems* .

(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~~ Servicing .

Legally required standby system equipment shall be maintained in accordance with manufacturer instructions and industry standards.

(D) ~~Written~~ Record Keeping .

A written record shall be kept on such tests and maintenance, and made available upon request to those authorized to design, install, inspect, maintain, and operate the system .

(E) Testing Under Load.

Means for testing legally required standby systems ~~under~~ during maximum anticipated load conditions 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).

Supplemental Information

File Name	Description	Approved
70_CMP_13_701.3_FR_7730.docx		
70_CMP_13_701.3_FR_7730.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 15:29:32 EST 2024

Committee Statement

Committee Statement: The informational note was added to correlate with section 700.3(A).

The use of the term commissioning is a defined term that addresses the practical steps needed for installation.

The definition of servicing is inclusive of maintenance and repair. This change to (C) will provide clarity.

The additional language of the availability of written records will provide correlation with other parts of the NEC that have performance testing or commissioning requirements and will provide additional useability.

Written records are understood to be inclusive of digital records.

The changes to (E) were made to correlate with 700.3(E) and to test under maximum anticipated load to ensure safe and reliable operation of the legally required standby system.

Response Message: FR-7730-NFPA 70-2024

Public Input No. 2295-NFPA 70-2023 [Section No. 701.3(D)]

Public Input No. 2498-NFPA 70-2023 [Section No. 701.3(D)]

Public Input No. 1683-NFPA 70-2023 [Section No. 701.3(E)]

Public Input No. 1574-NFPA 70-2023 [Section No. 701.3(D)]

Public Input No. 1675-NFPA 70-2023 [Section No. 701.3(A)]

Public Input No. 2557-NFPA 70-2023 [Section No. 701.3(A)]

70 CMP 13 701.3 FR 7730

701.3 Commissioning and Maintenance.
(A) Commissioning Witness Test.
The authority having jurisdiction shall conduct or witness the commissioning of the complete system upon installation.

Informational Note: See NECA 90, *Standard for Commissioning Building Electrical Systems*.

(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~~Servicing.
Legally required standby system equipment shall be maintained in accordance with manufacturer instructions and industry standards.
(D) ~~Written~~ Record Keeping.
A written record shall be kept on such tests and maintenance, and made available upon request to those authorized to design, install, inspect, maintain, and operate the system.
(E) Testing Under Load.
Means for testing legally required standby systems ~~under~~during maximum anticipated load conditions 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).

First Revision No. 7711-NFPA 70-2024 [Section No. 701.4]

701.4 Capacity and Rating.

(A) Rating.

Legally required standby system equipment shall be suitable for the available fault current at its terminals.

(B) Capacity.

A legally required standby system shall have adequate capacity in accordance with Article 220, Parts I through ~~IV of Article~~ 220 ~~or~~ IV 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.

(C) Load Management.

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 load management (that includes automatic selective load pickup and load shedding)is provided that will ensure adequate power to the legally required standby circuits.

(D) Parallel Operation.

Parallel operation shall comply with Article 705, Part I or ~~Part II of Article 705 where~~ Part II 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 Article 705, Part I or ~~Part II of Article 705 where~~ Part II 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~~ Legally required standby 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
Submittal Date: Tue Jan 16 14:14:32 EST 2024

Committee Statement

Committee Statement: The change was made in accordance with the NEC Style Manual section 4.1.4 regarding the use of parts of an article.

This revision provides correlation with section 700.4(D)(2) for consistency.

Response Message: FR-7711-NFPA 70-2024

Public Input No. 2558-NFPA 70-2023 [Section No. 701.4(D)(2)]

Public Input No. 2938-NFPA 70-2023 [Section No. 701.4]

First Revision No. 8202-NFPA 70-2024 [Section No. 701.5(A)]

(A) General.

Transfer equipment shall be automatic, listed, and marked for emergency system or legally required standby use. 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~~ of 705. 6 . Meter-mounted transfer switches shall not be permitted for legally required system use.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:28:43 EST 2024

Committee Statement

Committee Statement: The change was made in accordance with the NEC Style Manual section 4.1.4 to not reference an entire article.

Response Message: FR-8202-NFPA 70-2024

Public Input No. 3331-NFPA 70-2023 [Section No. 701.5(A)]

First Revision No. 8205-NFPA 70-2024 [Sections 701.5(B), 701.5(C)]

Sections 701.5(B), 701.5(C)

(B)_

~~Bypass Isolation~~

Automatic Transfer Switches.

~~Means to bypass and isolate the transfer switch equipment shall be permitted. Where bypass isolation switches are used, inadvertent parallel operation shall be avoided~~ Automatic transfer switches shall be electrically operated and mechanically held .

(C)

~~Automatic~~

Redundant Transfer

~~Switches.~~

Equipment

~~Automatic transfer switches shall be electrically operated and mechanically held.~~ If redundant transfer equipment is used a means shall be provided to disconnect the transfer switch from all supply and load side sources. Inadvertent parallel operation shall be prevented.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8205_701.5_B_.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:32:16 EST 2024

Committee Statement

Committee Statement: The entire requirement of redundant transfer equipment is not needed since the full requirements of an emergency system are not required in a legally required standby systems. However, when servicing and maintenance is performed it is necessary to have complete isolation of all sources. The requirements to prevent inadvertent paralleling was moved to correlate with the format of section 700.5. A bypass isolation switch is redundant transfer equipment.

Response Message: FR-8205-NFPA 70-2024

Public Input No. 3289-NFPA 70-2023 [Section No. 701.5(B)]

~~**(B) Bypass Isolation Switches.**~~
~~Means to bypass and isolate the transfer switch equipment shall be permitted. Where bypass isolation switches are used, inadvertent parallel operation shall be avoided.~~

(~~C~~B) Automatic Transfer Switches.
Automatic transfer switches shall be electrically operated and mechanically held.

(C) Redundant Transfer Equipment.
If redundant transfer equipment is used a means shall be provided to disconnect the transfer switch from all supply and load side sources. Inadvertent parallel operation shall be prevented.

First Revision No. 7702-NFPA 70-2024 [New Section after 701.7]

701.8 Surge Protection.

A listed SPD shall be installed in or on all legally required standby system switchgear, switchboards, and panelboards.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 13:30:08 EST 2024

Committee Statement

Committee Statement: The requirement to have Surge Protection on a legally required standby system will help enhance the safety and reliability of the system from overvoltage surges and surge currents. This will provide correlation with section 700.8 as well.

Response Message: FR-7702-NFPA 70-2024

Public Input No. 3432-NFPA 70-2023 [New Section after 701.7(B)]

First Revision No. 8206-NFPA 70-2024 [Sections 701.12(A), 701.12(B)]

****see attached for legislatively correct changes****

Sections 701.12(A), 701.12(B)

(A) Power Source Considerations.

In selecting a legally required standby source of power, consideration shall be given to the type of service to be rendered, whether of short-time duration or long duration.

(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: See ANSI/IEEE 493-2007, *Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems*, for further information.

Supplemental Information

File Name	Description	Approved
70_CMP_13_701.12A_and_B_FR_8206.docx		
70_CMP_13_701.12A_and_B_FR_8206.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:37:16 EST 2024

Committee Statement

Committee Statement: The title and section was are changed to provide clarity and enforceability of the requirements that are needed in the design of the duration of a power source for an emergency system in specific types of occupancies. It was formatted and changed to provide correlation with 700.12.

Response Message: FR-8206-NFPA 70-2024

Public Input No. 2501-NFPA 70-2023 [Sections 701.12(A), 701.12(B)]

70 CMP 13 701.12 A and B FR 8206

(A) Power Source ~~Considerations~~Duration.

~~In selecting a legally required standby source of power, consideration shall be given to the type of service to be rendered, whether of short-time duration or long duration.~~Power source duration shall be selected based upon the type of occupancy.

Informational note: An example of considerations of duration of an emergency power source, whether of minimum duration, as for evacuation of a theater, or longer duration, as for supplying emergency power and lighting due to an indefinite period of current failure from trouble either inside or outside the building.

(B) Equipment Design and Location.

~~Consideration shall be given to the location or design, or both, of all equipment~~Equipment shall be designed and located so as to minimize the hazards that might cause complete failure due to floods, fires, icing, and vandalism.

Informational Note: See ANSI/IEEE 493-2007, *Recommended Practice for the Design of Reliable Industrial and Commercial Power Systems*, for further information.

First Revision No. 8194-NFPA 70-2024 [Section No. 701.12(D)(3)]

(3) Outdoor Generator Sets.

~~If an~~ An outdoor-housed generator set ~~is~~ shall be equipped with a ~~readily accessible~~ disconnecting means in accordance with 445.18~~, and~~ . If the disconnecting means is not readily accessible or is not 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~~ supplied. The disconnecting means shall meet the requirements of 225.36.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 18:38:19 EST 2024

Committee Statement

Committee Statement: The word “where” as referenced in section 3.5.4 of the style manual is used to convey a location or a situation. The word “if” is used to indicate a condition and is the appropriate word for this requirement. The requirement was reworded to positive text and increase the useability of the requirement. The committee agreed to improve the clarity and useability of the requirement by putting it into positive text language.

Response Message: FR-8194-NFPA 70-2024

Public Input No. 1717-NFPA 70-2023 [Section No. 701.12(D)(3)]

Public Input No. 1951-NFPA 70-2023 [Section No. 701.12(D)(3)]

First Revision No. 8198-NFPA 70-2024 [Section No. 701.12(F)]

(F) Separate Service.

Where approved, by the authority having jurisdiction as suitable for use as a legally required standby source of power, an additional service shall be permitted ~~. This service shall be in accordance~~ with ~~Article 230 and~~ the following additional requirements:

(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.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:15:38 EST 2024

Committee Statement

Committee Statement: The requirements of Article 230 are already applicable due to the structure of the code and the section heading, so the reference was removed for redundancy. The language was improved for useability. “Standby” is added for consistency with the Article title.

Response Message: FR-8198-NFPA 70-2024

Public Input No. 1127-NFPA 70-2023 [Section No. 701.12(F)]

First Revision No. 8199-NFPA 70-2024 [Section No. 701.12(H)]

(H) Microgrid Systems.

On-site sources, designated as legally required standby sources, shall be permitted to be connected to a microgrid system.

The system shall include interconnection equipment listed for emergency use to 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.

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 this article.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:18:12 EST 2024

Committee Statement

Committee Statement: The term interconnection equipment is added to correlate with the permitted emergency sources in 701.12.

Response Message: FR-8199-NFPA 70-2024

Public Input No. 3049-NFPA 70-2023 [Section No. 701.12(H)]

First Revision No. 8193-NFPA 70-2024 [Section No. 701.12 [Excluding any Sub-Sections]]

Current supply shall be such that, in the event of failure of the normal supply to, or within, the building or group of buildings concerned, legally required standby power will be available within the time required for the application but not to exceed 60 seconds. The supply system for legally required standby purposes, in addition to the normal services to the building, shall be permitted to comprise one or more of the types of systems described in 701.12(A) through (~~I~~ H). Unit equipment in accordance with 701.12(I) shall satisfy the applicable requirements of this article.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 18:35:34 EST 2024

Committee Statement

Committee Statement: The reference to part (I) is incorrect and should only reference to part (H). The part (I) is covered in the last sentence of the requirement as unit equipment.

Response Message: FR-8193-NFPA 70-2024

Public Input No. 2559-NFPA 70-2023 [Section No. 701.12 [Excluding any Sub-Sections]]

First Revision No. 8201-NFPA 70-2024 [Section No. 701.32(B)]

(B) Replacements.

Where legally required standby OCPDs or normal system OCPDs that supply legally required standby load(s) are replaced, they shall be reevaluated to ensure selective ~~coordination~~ coordination of the legally required standby system is maintained with all supply-side and load-side OCPDs.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:25:44 EST 2024

Committee Statement

Committee Statement: The change was made to help enhance the safety and reliability of a legally required standby power system by adding clarity to what overcurrent protective devices shall be reevaluated when replacements are made.

Response Message: FR-8201-NFPA 70-2024

Public Input No. 4112-NFPA 70-2023 [Section No. 701.32(B)]

First Revision No. 8200-NFPA 70-2024 [Section No. 701.32(C)]

(C) Modifications.

If modifications, additions, or deletions to the legally required standby system(s) or the normal system supplying the legally required standby system load(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 1: See *NECA 700, Standard for Installing Overcurent Protection to Achieve Selective Coordination* for additional information on how to achieve selective coordination.

Informational Note 2: See Informational Note Figure 701.32~~(C)~~ for an example of how legally required standby system OCPDs selectively coordinate with all supply-side OCPDs.

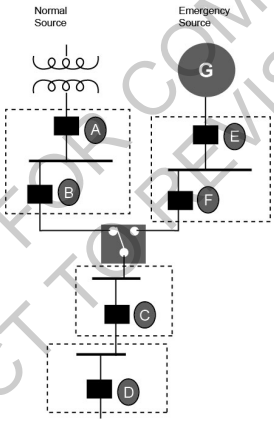
OCPD D selectively coordinates with OCPDs C, F, E, B, and A.

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(C) Legally Required Standby System Selective Coordination.



Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:21:57 EST 2024

Committee Statement

Committee Statement: The addition of the Informational Notes No. 1, referencing the NECA Standard, will provide the user with information on how to achieve selective coordination.

The change to the body of (C) provides clarity on maintaining selective coordination with the normal system and provides correlation with section 240.11.

Also, the revision reaffirms the language in TIA. 23-11. This change removes the reference to Part C in the Informational Note and Figure in 701.32

Response Message: FR-8200-NFPA 70-2024

Public Input No. 4398-NFPA 70-2023 [Section No. 701.32]

Public Input No. 4114-NFPA 70-2023 [Section No. 701.32(C)]

First Revision No. 7746-NFPA 70-2024 [Section No. 702.2]

702. ~~2~~ **3** Reconditioned Equipment.

Reconditioned transfer switches shall not be ~~permitted~~ installed .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 16:02:30 EST 2024

Committee Statement

Committee Statement: The changes were made in accordance with section 2.2.1 of the NEC Style Manual.

Response Message: FR-7746-NFPA 70-2024

Public Input No. 2618-NFPA 70-2023 [Section No. 702.2]

First Revision No. 7744-NFPA 70-2024 [Section No. 702.4(A)(2)]

(2) Automatic Load Connection.

If the connection of load is automatic, an optional standby system shall comply with 702.4(A)(2)(a) or (A)(2)(b) in accordance with Article 220, Parts I through ~~IV of Article 220 or~~ IV or by another approved method.

(a) *Full Load.* The standby source shall be capable of supplying the full load that is automatically connected.

(b) *Energy Management System (EMS).* Where a system is employed in accordance with 750.30 that will automatically manage the connected load, the standby source shall have a capacity sufficient to supply the maximum load that will be connected by the EMS.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 16:00:58 EST 2024

Committee Statement

Committee Statement: The change is made in accordance with section 4.1.4 of the NEC Style Manual.

Response Message: FR-7744-NFPA 70-2024

Public Input No. 2939-NFPA 70-2023 [Section No. 702.4(A)(2)]

First Revision No. 8208-NFPA 70-2024 [Section No. 702.5(A)]

(A) General.

Interconnection, interlocking device, or transfer equipment shall be required for all standby systems subject to the requirements of this article. 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.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:46:09 EST 2024

Committee Statement

Committee Statement: Adding the words “interlocking device” adds clarity along with keeping the original “interconnection” wording. The phrase interlocking device refers to commonly used kits for panelboards to prevent inadvertent simultaneous connection of multiple sources.

Response Message: FR-8208-NFPA 70-2024

Public Input No. 1926-NFPA 70-2023 [Section No. 702.5(A)]

First Revision No. 8209-NFPA 70-2024 [Section No. 702.5(D)]

(D) Parallel Installation.

Systems installed to permit operation in parallel with the normal source shall also meet Article 705, Part I or Part II ~~of Article 705~~ .

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 19:48:03 EST 2024

Committee Statement

Committee Statement: The change was made in accordance with section 4.1.4 of the NEC Style Manual.
Response Message: FR-8209-NFPA 70-2024

Public Input No. 2940-NFPA 70-2023 [Section No. 702.5(D)]

First Revision No. 8211-NFPA 70-2024 [Section No. 702.7(A)]

(A) Standby.

~~A sign shall be placed at the service equipment for other than one- and two-family dwellings that indicates the type and location of each on-site optional standby power source~~ (1) One- and Two-Family Dwelling Units . For one- and two-family dwelling units, a sign shall be placed at the disconnecting means required in 225.41 and 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 445.19(C).

(2) Other Than One- and Two-Family Dwelling Units. A sign shall be placed at the service equipment for other than one- and two-family dwellings that indicates the type and location of each on-site optional standby power source.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8211_702.7_A_.docx		

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 19:51:08 EST 2024

Committee Statement

Committee Statement: Added the reference to 225.41 for the emergency disconnect requirement for outside feeders supply a dwelling unit. The change to a second level subdivision format provides improved clarity and enforceability.

Response Message: FR-8211-NFPA 70-2024

Public Input No. 3171-NFPA 70-2023 [Section No. 702.7(A)]

Public Input No. 2264-NFPA 70-2023 [Section No. 702.7(A)]

(A) Standby. [Move text to (1) and (2)]

~~A sign shall be placed at the service equipment for other than one- and two-family dwellings 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 445.19(C).~~

(1) One- and Two-Family Dwelling Units.

For one- and two-family dwelling units, a sign shall be placed at the disconnecting means required in 225.41 and 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 445.19(C).

(2) Other Than One- and Two-Family Dwelling Units.

A sign shall be placed at the service equipment for other than one- and two-family dwellings that indicates the type and location of each on-site optional standby power source.

First Revision No. 8207-NFPA 70-2024 [Section No. 702.11]

702.11 Portable Generator Grounding.

(A) Separately Derived System.

Where a portable ~~optional standby source~~ generator is used as a separately derived system, it shall ~~be grounded to a grounding electrode in accordance~~ comply with 250.30.

(B) Nonseparately Derived System.

Where a portable ~~optional standby source~~ generator is used as a nonseparately derived system, the equipment grounding conductor shall be bonded to the system grounding electrode.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:43:43 EST 2024

Committee Statement

Committee Statement: The editorial changes to include the phrase portable generator based on the section title and compliance with 250.30 bring clarity to the requirement.

Response Message: FR-8207-NFPA 70-2024

Public Input No. 3173-NFPA 70-2023 [Section No. 702.11]

First Revision No. 8212-NFPA 70-2024 [Section No. 702.12(A)]

(A) Portable Generators Greater Than 15 kW and Permanently Installed Generators.

~~Where an~~ An outdoor housed generator set ~~is~~ shall be equipped with a ~~readily accessible~~ disconnecting means in accordance with 445.18~~, and~~ . When the disconnecting means is not readily accessible or is not 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~~ supplied. The disconnecting means shall meet the requirements of 225.36.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 19:55:12 EST 2024

Committee Statement

Committee Statement: The revision improves clarity and useability of the requirement by putting it into positive text language.

Response Message: FR-8212-NFPA 70-2024

First Revision No. 8150-NFPA 70-2024 [New Section after 706.1]

706.3 Reconditioned Equipment.

Reconditioned energy storage systems shall not be installed.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 15:30:26 EST 2024

Committee Statement

Committee Statement: These items are not recommended to be reconditioned per the NEMA Technical Position on Reconditioned Equipment (NEMA CS 100-2020). There is a lack of data or documented requirements that support safe reconditioning of energy storage systems.

Response Message: FR-8150-NFPA 70-2024

Public Input No. 633-NFPA 70-2023 [New Section after 706.1]

First Revision No. 8145-NFPA 70-2024 [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: See Article 480 for installations ~~that meet the definition~~ of *stationary ~~standby~~ batteries*.

Informational Note No. 2: For batteries rated in ampere hours, kWh is equal to the nominal rated voltage times ampere-hour rating divided by 1000.

Informational Note No. 3: The following standards are frequently referenced for the installation of ESSs:

(1) NFPA 1-2021, *Fire Code*

(2) NFPA 111-2019, *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: Fri Jan 19 15:18:44 EST 2024

Committee Statement

Committee Statement: The application of energy storage systems is not restricted by this Article.

The term standby is removed to match the title of Article 480.

Standards were removed because they relate to components of the energy storage system instead of the system itself. References are required to have edition dates per NEC Style Manual.

Response Message: FR-8145-NFPA 70-2024

Public Input No. 4449-NFPA 70-2023 [Section No. 706.1]

First Revision No. 7899-NFPA 70-2024 [Section No. 706.3]

~~**706.3** Qualified Personnel.~~

~~The installation and maintenance of ESS equipment and all associated wiring and interconnections shall be performed only by qualified persons.~~

~~Informational Note: See Article 100 for the definition of *qualified person* .~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 17:04:41 EST 2024

Committee Statement

Committee Statement: The NEC requires that personnel be qualified to work on the electrical systems that they are installing or servicing. A specific reiteration of the person to be qualified is not needed.

Response Message: FR-7899-NFPA 70-2024

First Revision No. 7855-NFPA 70-2024 [Section No. 706.4]

706.4 ~~System Requirements~~ 4 Marking .

Each ESS shall be provided with a nameplate plainly visible after installation and marked with the following:

(1) Manufacturer's name, trademark, or other descriptive marking by which the organization responsible for supplying the ESS can be identified

(2) Rated frequency

(3) Number of phases, if ac

(4) Rating (kW or kVA)

(5) Available fault current derived by the ESS at the output terminals

(6) Maximum output and input current of the ESS at the output terminals

(7) Maximum output and input voltage of the ESS at the output terminals

(8) Utility-interactive capability, if applicable

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 13:35:10 EST 2024

Committee Statement

Committee Statement: Changed 'Systems Requirements' to 'Marking' to be consistent with other parts of the code.

Response Message: FR-7855-NFPA 70-2024

Public Input No. 4478-NFPA 70-2023 [Section No. 706.4]

First Revision No. 8149-NFPA 70-2024 [Section No. 706.5]

move to become 706. 5– 2; no further changes

706.2 Listing.

Energy storage systems shall be listed.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 15:24:09 EST 2024

Committee Statement

Committee Statement: Moved the listing section to 706.2 to be consistent with the NEC Style Manual.

Response Message: FR-8149-NFPA 70-2024

Public Input No. 2831-NFPA 70-2023 [Section No. 706.5]

Public Input No. 2829-NFPA 70-2023 [New Section after 706.1]

First Revision No. 8153-NFPA 70-2024 [Section No. 706.7(A)]

(A) Commissioning.

ESSs shall be commissioned upon installation ~~. This shall not apply in one- and two-family dwellings~~ in accordance with manufacturer's instructions .

Informational Note: See NFPA 855-~~2020~~ 2023 , *Standard for the Installation of Stationary Energy Storage Systems*, for information related to the commissioning of ESSs.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 15:38:20 EST 2024

Committee Statement

Committee Statement: The 2023 NEC requirements in Section 706.7(A) imply that a residential ESS is not required to be commissioned upon installation. This does not align with manufacturer's instructions provided as part of the product listing required in Section 706.5. The UL 9540 Standard requires commissioning instructions be provided by the manufacturer in the installation instructions for the ESS in Section 42.1(a). This requirement applies to every listed ESS, including those installed in residential applications. Although this section does not require that AHJs witness or conduct the commissioning, the importance of commissioning for residential ESS should be reflected in this section.

The informational note should be revised to remove the date reference in compliance with Section 90.5(C).

Response Message: FR-8153-NFPA 70-2024

Public Input No. 1374-NFPA 70-2023 [Section No. 706.7(A)]

First Revision No. 8155-NFPA 70-2024 [Section No. 706.7(B)]

(B) Maintenance.

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~~ In other than one- and two-family dwelling units, a written record of the system maintenance shall be kept and shall include records of ~~repairs~~ servicing and replacements necessary to maintain the system in proper and safe operating condition. ~~This shall not apply in one- and two-family dwellings.~~

Informational Note: See NFPA 70B~~-2019~~ , ~~*Recommended Practice*~~ *Standard 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.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 15:43:23 EST 2024

Committee Statement

Committee Statement: Servicing is a defined term and includes repairs. Using a defined term adds clarity and helps avoid confusion between activities that are deemed as servicing and those that are deemed as reconditioning.

The 2023 NEC language in 706.7(B) implies that a residential ESS is not required to be maintained in a safe operating condition. This does not align with manufacturer's instructions provided as part of the product listing required in Section 706.5. The UL 9540 Standard requires maintenance instructions to be provided by the manufacturer in the installation instructions for the ESS in Section 42.1(a). This requirement applies to every listed ESS, including ones installed in residential applications. The informational note should be revised to update the title of NFPA 70B and remove the date references in compliance with Section 90.5(C)

Response Message: FR-8155-NFPA 70-2024

Public Input No. 3852-NFPA 70-2023 [Sections 706.7(A), 706.7(B)]

Public Input No. 1331-NFPA 70-2023 [Section No. 706.7(B)]

Public Input No. 1375-NFPA 70-2023 [Section No. 706.7(B)]

First Revision No. 8158-NFPA 70-2024 [Section No. 706.15(B)]

(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 ~~,~~ shall be lockable open in accordance with 110.25 or the enclosure providing access to the disconnecting means ~~,~~ shall be capable of being locked ~~in accordance with 110~~ closed ~~.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.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 15:47:52 EST 2024

Committee Statement

Committee Statement: The text is revised to comply with the NEC Style Manual (Section 3.2.5.3).

Also, the wording was revised to separate the disconnect from the enclosure providing access to the disconnect. The disconnect should be lockable open but the enclosure containing the disconnect should be capable of being locked to prevent unauthorized access.

Response Message: FR-8158-NFPA 70-2024

Public Input No. 2547-NFPA 70-2023 [Section No. 706.15(B)]

First Revision No. 8160-NFPA 70-2024 [Section No. 706.15(C)]

(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 output 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*, for industry practices for equipment labeling. This standard provides specific criteria for developing arc-flash labels for equipment that provides nominal system voltage, incident energy levels, arc-flash boundaries, as well as minimum required levels of personal protective equipment~~, and so forth~~ .

Informational Note No. 2: ESS electronics could include inverters or other types of power conversion equipment.

For ESS disconnecting means where the line and load terminals 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).

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 15:50:37 EST 2024

Committee Statement

Committee Statement: The change is grammatical to ensure a correct statement of fact.

Response Message: FR-8160-NFPA 70-2024

Public Input No. 3861-NFPA 70-2023 [Section No. 706.15(C)]

First Revision No. 8171-NFPA 70-2024 [Section No. 706.15(E)(2)]

(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 if covered in the listing .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:16:10 EST 2024

Committee Statement

Committee Statement: The use of non-load break bolted or plug-in disconnects may cause additional hazards when they are disconnected. However, they can be used if they were included in the listing.

Response Message: FR-8171-NFPA 70-2024

First Revision No. 8161-NFPA 70-2024 [Section No. 706.15(E)(3)]

(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,~~ lockable open 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: Fri Jan 19 15:53:53 EST 2024

Committee Statement

Committee Statement: The text is revised to comply with the NEC Style Manual (Section 3.2.5.3).
Response Message: FR-8161-NFPA 70-2024

Public Input No. 2548-NFPA 70-2023 [Section No. 706.15(E)(3)]

First Revision No. 8162-NFPA 70-2024 [Section No. 706.15(E)(4)]

(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

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

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 15:55:12 EST 2024

Committee Statement

Committee Statement: The exception for family dwellings has been added to be consistent with 706.15(C).

Response Message: FR-8162-NFPA 70-2024

Public Input No. 3029-NFPA 70-2023 [Section No. 706.15(E)(4)]

First Revision No. 7871-NFPA 70-2024 [Section No. 706.16]

~~**706.16** Connection to Energy Sources.~~

~~The connection of an ESS to sources of energy shall comply with 706.16(A) through (F).~~

~~**(A)** Source Disconnect.~~

~~A disconnect that has multiple sources of power shall disconnect all energy sources when in the off position.~~

~~**(B)** Identified Interactive Equipment.~~

~~ESS that operate in parallel with other ac sources shall use inverters that are listed and identified as interactive.~~

~~**(C)** Loss of Interactive System Power.~~

~~Upon loss of a primary source of power, an ESS with a utility-interactive inverter shall comply with the requirements of 705.40 .~~

~~**(D)** Unbalanced Interconnections.~~

~~Unbalanced ac connections between an ESS and other ac electric power production sources shall be in accordance with 705.45~~

~~**(E)** Other Energy Sources.~~

~~The connection of an ESS to other energy sources shall be in accordance with 705.12 .~~

~~**(F)** Stand-Alone Operation.~~

~~Where the output of an ESS is capable of operating in stand-alone mode, the requirements of 710.15 shall apply.~~

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Wed Jan 17 14:49:33 EST 2024

Committee Statement

Committee Statement: This section does not modify other requirements and therefore is removed in accordance with 4.1.1 NEC Style Manual.
Response Message: FR-7871-NFPA 70-2024

Public Input No. 3030-NFPA 70-2023 [Section No. 706.16]
Public Input No. 334-NFPA 70-2023 [Section No. 706.16(E)]
Public Input No. 3854-NFPA 70-2023 [Section No. 706.16(E)]
Public Input No. 2062-NFPA 70-2023 [Section No. 706.16(F)]

First Revision No. 8164-NFPA 70-2024 [Section No. 706.20]

706.20 General.

(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 855-2020, *Standard for the Installation of Stationary Energy Storage Systems*, for technology-specific guidance. Not all ESS technologies require ventilation.

Informational Note No. 2: 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.

~~**(B)** Dwelling Units.~~

~~An ESS for one- and two-family dwelling units shall not exceed 100 volts dc between conductors or to ground.~~

~~Exception:~~

~~Where live parts are not accessible during routine ESS maintenance, a maximum ESS voltage of 600 volts dc shall be permitted.~~

(

~~C)~~ ~~Spaces About ESS Components.~~

~~**(1)** General.~~

~~Working spaces for ESS shall comply with 110.26 and 110.34 .~~

~~**(2)**~~ B) Space Between Components.

ESSs shall be permitted to have space between components in accordance with the manufacturer's instructions and listing.

Informational Note: Additional space may be needed to accommodate ESS hoisting equipment, tray removal, or spill containment.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8164_706.20.docx		

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 16:02:01 EST 2024

Committee Statement

Committee The requirements in (new) Section 706.2 require listing for all energy storage

Statement: systems. The installation

instructions are required to provide specific details on the spacing of ESS components and any

required ventilation. The working space requirements in Section 110.26 and 110.34 are required for all

installations and should not be repeated in this section. The dwelling unit voltage limits and exception

are removed as the product standard addresses exposure to live parts in the product listing

evaluation.

Response Message: FR-8164-NFPA 70-2024

Public Input No. 3031-NFPA 70-2023 [Section No. 706.20(C)(1)]

Public Input No. 265-NFPA 70-2023 [Section No. 706.20(C)(1)]

Public Input No. 1376-NFPA 70-2023 [Section No. 706.20]

Public Input No. 675-NFPA 70-2023 [Section No. 706.20(C)]

Public Input No. 2914-NFPA 70-2023 [Section No. 706.20(B)]

706.20 General.

(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 855-2020, *Standard for the Installation of Stationary Energy Storage Systems*, for technology-specific guidance. Not all ESS technologies require ventilation.

Informational Note No. 2: 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.

~~**(B) Dwelling Units.**~~
~~An ESS for one- and two-family dwelling units shall not exceed 100 volts dc between conductors or to ground.~~

~~*Exception: Where live parts are not accessible during routine ESS maintenance, a maximum ESS voltage of 600 volts dc shall be permitted.*~~

~~**(C) Spaces About ESS Components.**~~

~~**(1) General.**~~
~~Working spaces for ESS shall comply with 110.26 and 110.34.~~

(2) Space Between Components. [Move to (B)]
ESSs shall be permitted to have space between components in accordance with the manufacturer's instructions and listing.

Informational Note: Additional space may be needed to accommodate ESS hoisting equipment, tray removal, or spill containment.

First Revision No. 7882-NFPA 70-2024 [Section No. 706.21]

~~**706.21** Directory (Identification of Power Sources).~~

~~ESS shall be indicated by markings or labels that shall be in accordance with 110.21(B) .~~

~~**(A)** Facilities with Utility Services and ESS.~~

~~Plaques or directories shall be installed in accordance with 705.10 .~~

~~**(B)** Facilities with Stand-Alone Systems.~~

~~Plaques or directories shall be installed in accordance with 710.10 .~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 15:24:30 EST 2024

Committee Statement

Committee Statement: The requirements for a power source directory in Section 706.21 are redundant to the requirements in other parts of the code and are therefore removed.

Response Message: FR-7882-NFPA 70-2024

Public Input No. 1377-NFPA 70-2023 [Section No. 706.21]

First Revision No. 8166-NFPA 70-2024 [Section No. 706.30(A)(3)]

(3) Inverter Input Circuit Current.

The maximum current shall be the rated continuous ~~inverter~~ input current ~~rating when~~ of the inverter. Where the rated current is not provided, the maximum current shall be the calculated continuous inverter input current when the inverter is producing rated power at the lowest input voltage.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:07:42 EST 2024

Committee Statement

Committee Statement: The manufacturer-specified rated continuous input current, where available, should be used to maintain system safety and size components and conductors for actual operating values.

As currently written, the Section requires calculating maximum current based on the lowest operating voltage and rated power as specified by the equipment manufacturer, instead of using a manufacturer rated value, if provided. A calculated value in some cases will be lower than the rated current which could be a safety concern.

Response Message: FR-8166-NFPA 70-2024

Public Input No. 4177-NFPA 70-2023 [Section No. 706.30(A)(3)]

First Revision No. 8165-NFPA 70-2024 [Section No. 706.30(A) [Excluding any Sub-Sections]]

The maximum current for the specific circuit shall be calculated in accordance with 706.30(A)(1) through (A)(5). Calculations shall be permitted to be rounded to the nearest whole ampere, with decimal fractions smaller than 0.5 dropped.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:06:08 EST 2024

Committee Statement

Committee Statement: This language is based on an existing allowance in 220.5(B), which applies to ampere calculations for branch-circuits, feeders, and services. It extends this allowance for rounding to the nearest whole ampere (and dropping decimal fractions smaller than 0.5) to calculations in Articles 690, 705, and 706, making it clear that this allowance is valid for circuits that are defined and named differently than those covered in Article 220.

Response Message: FR-8165-NFPA 70-2024

Public Input No. 4250-NFPA 70-2023 [Section No. 706.30(A) [Excluding any Sub-Sections]]

First Revision No. 7885-NFPA 70-2024 [Section No. 706.31(D)]

~~**(D)** Current Limiting.~~

~~A listed and labeled current-limiting overcurrent protective device shall be installed adjacent to the ESS for each dc output circuit.~~

~~*Exception: Where current-limiting overcurrent protection is provided for the dc output circuits of a listed ESS, additional current-limiting overcurrent devices shall not be required.*~~

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Wed Jan 17 15:31:37 EST 2024

Committee Statement

Committee Statement: Current limiting devices are not needed in this application and this section should be deleted.

Response Message: FR-7885-NFPA 70-2024

Public Input No. 4145-NFPA 70-2023 [Section No. 706.31(D)]

First Revision No. 8167-NFPA 70-2024 [Section No. 706.41]

706.41 Electrolyte Classification.

The electrolyte(s) that are acceptable for use in the batteries associated with the ESS shall be identified by name and chemical composition. Such identification shall be provided by readily discernable signage adjacent to ~~every location in the system where the electrolyte can be put into or taken out of the system~~ each entry door to the system .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 16:09:55 EST 2024

Committee Statement

Committee Statement: As currently written in the existing text, for containerized walk-in systems, signage is only visible when inside the container. Having signage outside allows first responders to know what they are dealing with prior to entering the ESS. Some fire codes require signage adjacent to each entry door.

Response Message: FR-8167-NFPA 70-2024

Public Input No. 4016-NFPA 70-2023 [Section No. 706.41]

First Revision No. 8168-NFPA 70-2024 [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*. The systems shall comply with Parts I, II, ~~III,~~ _ and ~~IV~~ III of this article.

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 16:14:06 EST 2024

Committee Statement

Committee Statement: The revision reaffirms the language in TIA 20-14.
Response Message: FR-8168-NFPA 70-2024

Public Input No. 1607-NFPA 70-2023 [Section No. 706.50]

First Revision No. 7717-NFPA 70-2024 [Section No. 708.2]

708. ~~2~~ **3** Reconditioned Equipment.

Reconditioned transfer switches shall not ~~be permitted~~ be installed .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 14:29:36 EST 2024

Committee Statement

Committee Statement: The change was made in accordance with section 2.2.1 of the NEC Style Manual.

Response Message: FR-7717-NFPA 70-2024

Public Input No. 2619-NFPA 70-2023 [Section No. 708.2]

First Revision No. 8218-NFPA 70-2024 [Section No. 708.6(D)]

(D) Written Record.

A written record shall be kept of such tests and maintenance and made available to those authorized to design, install, inspect, maintain and operate the system .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 20:31:13 EST 2024

Committee Statement

Committee Statement: The addition of this requirement adds clarity and consistency with other parts of this code. It also adds to the requirement of having a record by making it available to those that need it.

Response Message: FR-8218-NFPA 70-2024

Public Input No. 1575-NFPA 70-2023 [Section No. 708.6(D)]

Public Input No. 2296-NFPA 70-2023 [Section No. 708.6(D)]

First Revision No. 8219-NFPA 70-2024 [Section No. 708.7]

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:

(3) The system and associated software are identified as being evaluated for cybersecurity.

(4) 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

Informational Note No. 3: Cybersecurity may require constant attention to security vulnerabilities that could arise due to software defects, system configuration changes, or user interactions.

Informational Note No. 4: See NEMA *CY 10000 Cybersecurity Implementation Guidance for Connected Electrical Infrastructure* , for recommendations on how to meet this requirement.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 20:35:45 EST 2024

Committee Statement

Committee Statement: The revised informational note adequately communicates the risks of cybersecurity issues. The removal of system changes and 5 year interval allows the user to conduct adequately timed assessments according to their needs.

The NEMA document provides the user with guidance on how to meet these requirements and others. Regarding PI 4461, it is not permitted to reference other standards and requirements of other standards like NFPA 70B in the requirements of the NEC (see section 4.2 of the NEC Style Manual).

Response Message: FR-8219-NFPA 70-2024

Public Input No. 4136-NFPA 70-2023 [Section No. 708.7]

Public Input No. 3434-NFPA 70-2023 [Section No. 708.7]

Public Input No. 4461-NFPA 70-2023 [Section No. 708.7]

First Revision No. 8213-NFPA 70-2024 [Section No. 708.10(C)(1)]

(1) Protection Against Physical Damage.

The wiring of the COPS system shall be protected against physical damage. Only the following wiring methods shall be permitted:

(1) Rigid metal conduit, intermediate metal conduit, Type MI, or non-interlocked Type ~~MI~~ MC cable.

(2) Where encased in not less than 50 mm (2 in.) of concrete, any of the following wiring methods shall be permitted:

(3) Schedule 40 or Schedule 80 rigid polyvinyl chloride conduit (PVC)

(4) Reinforced thermosetting resin conduit (RTRC)

(5) Electrical metallic tubing (EMT)

(6) Flexible nonmetallic or jacketed metallic raceways

(7) Jacketed metallic cable assemblies listed for installation in concrete

(8) Where provisions must be made for flexibility at equipment connection, one or more of the following shall also be permitted:

(9) Flexible metal fittings

(10) Flexible metal conduit with listed fittings

(11) Liquidtight flexible metal conduit with listed fittings

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 20:09:12 EST 2024

Committee Statement

Committee Statement: The requirements for crush resistance of non-interlocked MC cable show to have values equal to or greater than MI cable for obtaining a minimum level of physical protection.

Response Message: FR-8213-NFPA 70-2024

Public Input No. 3794-NFPA 70-2023 [Section No. 708.10(C)(1)]

First Revision No. 8080-NFPA 70-2024 [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: 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: 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. 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)

(4) The cable or raceway is encased in concrete with a minimum thickness of ~~50 mm~~ 127 mm (~~2 in~~ 5 in .) measured from each point on the surface of the cable or raceway.

Exception No. 1: Cables and raceways installed underground shall not be considered to be inside the building.

Exception No. 2: Alternative thicknesses of concrete shall be permitted to be selected by a licensed professional engineer qualified in such design. The selection shall be documented and stamped by the professional engineer.

Informational Note: See Fire Protection Research Foundation Report FPRF-2018-16 *Fire Resistance of Concrete for Electrical Conductors* for information about concrete fire resistance.

Supplemental Information

File Name	Description	Approved
NEC_CMP13_FR-8080_708.10_C_2_.docx		

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 10:59:56 EST 2024

Committee Statement

Committee Statement: Installations aboveground are likely to be directly exposed in the event of a fire, and analysis by the NFPA Fire Research Protection Foundation reported (Report number: FPRF-2018-16) that encasement in 2" of nearly every type of concrete would result in temperatures that are higher than normal building wire insulations could survive for the 2 hours that would be equivalent to the other permitted methods. To achieve sufficient protection in this type of installation, the report stated "… it is suggested that electrical feeders are to be encased in 5 inches of concrete when this is the method of fire protection. This is because at 5 inches all types of concrete, when properly casted, have a fire resistance rating of 2 or more hours. By making the requirement 5 inches you remove the need to specify the type of concrete to use." While 2" could provide physical protection, it would not provide thermal protection for most types of concrete. An exception was added to clarify that conductors under ground would not be considered inside the building. A second exception was added to recognize that a qualified engineer could use available data to design concrete protection that would provide equivalent thermal protection. An informational note was added to direct the code user to the Fire Protection Research Foundation report regarding fire resistance of concrete for electrical conductors.

Response Message: FR-8080-NFPA 70-2024

Public Input No. 3716-NFPA 70-2023 [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: 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: 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. 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 concrete with a minimum thickness of ~~50~~ 127 mm (~~2~~ 5 in.) measured from each point on the surface of ~~concrete.~~the cable or raceway.

   Exception No. 1: Cables and raceways installed underground shall not be considered to be inside the building.

   Exception No. 2: Alternative thicknesses of concrete shall be permitted to be selected by a licensed professional engineer qualified in such design. The selection shall be documented and stamped by the professional engineer.

   Informational Note: See Fire Protection Research Foundation Report FPRF-2018-16, *Fire Resistance of Concrete for Electrical Conductors*, for information about concrete fire resistance.

First Revision No. 8214-NFPA 70-2024 [Section No. 708.20(D)]

make changes and move to 708.8

(D) Surge Protection~~-Devices~~ .

~~Surge protection devices~~ A listed SPD shall be ~~provided at all facility distribution voltage levels~~ installed in or on all critical operations power systems switchgear, switchboards, and panelboards .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 20:15:58 EST 2024

Committee Statement

Committee Statement: The changes were made to add clarity, enforceability and correlation by moving from 708.20(D) and reformatting to 708.8 for correlation in 700.8 in emergency systems. This revision was moved to Part I to add surge protection at all levels of COPS distribution equipment. Section 708.8, Commissioning, was moved to new section 708.9 for formatting purposes.

Response Message: FR-8214-NFPA 70-2024

Public Input No. 3433-NFPA 70-2023 [Section No. 708.20(D)]

First Revision No. 7719-NFPA 70-2024 [Section No. 708.20(H)]

(H) Fuel Cell System.

Installation of a fuel cell system shall meet the requirements of Article 692, Parts II through VI ~~of Article~~ ~~692~~ .

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Tue Jan 16 14:32:28 EST 2024

Committee Statement

Committee Statement: The editorial change was made in compliance with section 4.1.4 of the NEC Style Manual.
Response Message: FR-7719-NFPA 70-2024

Public Input No. 2943-NFPA 70-2023 [Section No. 708.20(H)]

First Revision No. 7721-NFPA 70-2024 [Section No. 708.22(A)]

(A) Capacity and Rating.

A COPS shall have capacity and rating for all loads to be operated simultaneously for continuous operation with variable load for an unlimited number of hours, except for required maintenance of the power source. A portable, temporary, or redundant alternate power source shall be available for use whenever the COPS power source is out of service for servicing or maintenance ~~or repair~~ .

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 14:58:21 EST 2024

Committee Statement

Committee Statement: The change is made to add clarity and increased correlation with other parts of this code for servicing and maintenance.

Response Message: FR-7721-NFPA 70-2024

Public Input No. 1332-NFPA 70-2023 [Section No. 708.22(A)]

First Revision No. 8215-NFPA 70-2024 [Section No. 708.24]

see attached for legislatively correct changes

708.24 Transfer Equipment.

(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 Parts I and II of Article 705.

(B) Bypass Isolation Transfer Switches.

Means shall be permitted to bypass and isolate the transfer equipment. If bypass isolation transfer switches are used, inadvertent parallel operation shall be avoided.

(C) Automatic Transfer Switches.

If used with sources that are not inherently synchronized, automatic transfer switches shall comply with the following:

(1) Automatic transfer switches shall be listed for emergency use.

(2) Automatic transfer switches shall be electrically operated and mechanically held.

(D) Redundant Transfer Equipment.

If COPS loads are supplied by a single feeder, the COPS shall include redundant transfer equipment or a bypass isolation transfer switch to facilitate maintenance as required in 708.6(C) without jeopardizing continuity of power. If the redundant transfer equipment or bypass isolation transfer switch is manual (or nonautomatic), then it shall be actively supervised by a qualified person when the primary (automatic) transfer equipment is disabled for maintenance or repair.

(E) Use.

Transfer equipment shall supply only COPS loads.

(F) Documentation.

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.

Supplemental Information

File Name	Description	Approved
70_CMP_13_708.24_FR_8215.docx		
70_CMP_13_708.24_FR_8215.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13
Submittal Date: Fri Jan 19 20:19:40 EST 2024

Committee Statement

Committee Statement: The proposed modifications were added and reformatted to provide clarity and useability. Sub-section (B) was deleted and relevant parts were moved into new part (C) to permit use of bypass isolation switch. The term repair was deleted and changed to servicing and maintenance to correlate with section 110.17. The editorial change was made in compliance with section 4.1.4 of the NEC Style Manual.

Response Message: FR-8215-NFPA 70-2024

Public Input No. 3436-NFPA 70-2023 [Section No. 708.24(D)]

Public Input No. 2944-NFPA 70-2023 [Section No. 708.24(A)]

Public Input No. 3290-NFPA 70-2023 [Section No. 708.24]

Public Input No. 1333-NFPA 70-2023 [Section No. 708.24(D)]

70 CMP 13 708.24 FR 8215

708.24 Transfer Equipment.

(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, Parts I and II ~~of Article 705~~.

~~**(B) Bypass Isolation Transfer Switches.**~~

~~Means shall be permitted to bypass and isolate the transfer equipment. If bypass isolation transfer switches are used, inadvertent parallel operation shall be avoided.~~

(~~C~~B) Automatic Transfer Switches.

If used with sources that are not inherently synchronized, automatic transfer switches shall comply with the following:

(1) Automatic transfer switches shall be listed for emergency use.
(2) Automatic transfer switches shall be electrically operated and mechanically held.

(~~D~~C) Redundant Transfer Equipment.

If COPS loads are supplied by a single feeder, the COPS shall include redundant transfer equipment or a bypass isolation transfer switch to facilitate maintenance as required in 708.6(C) without jeopardizing continuity of power. If the redundant transfer equipment or bypass isolation ~~transfer~~ switch is manual (or nonautomatic), then it shall be actively supervised by a qualified person when the primary (automatic) transfer equipment is disabled for servicing and maintenance ~~or repair~~. When redundant transfer equipment is used, a means shall be provided to disconnect the transfer switch from all supply side sources. Inadvertent parallel operation shall be prevented.

(~~E~~D) Use.

Transfer equipment shall supply only COPS loads.

(~~F~~E) Documentation.

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.

First Revision No. 8216-NFPA 70-2024 [Section No. 708.54(B)]

(B) Replacements.

Where critical operations power system(s) OCPDs or normal system OCPDs that supply critical operations power system load(s) are replaced, they shall be reevaluated to ensure selective coordination of the critical operations power system(s) is maintained with all supply-side and load-side OCPDs.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 20:25:00 EST 2024

Committee Statement

Committee Statement: The change was made to help enhance the safety and reliability of a critical operations power system by adding clarity to what overcurrent protective devices shall be reevaluated when replacements are made.

Response Message: FR-8216-NFPA 70-2024

Public Input No. 4054-NFPA 70-2023 [Section No. 708.54(B)]

First Revision No. 8217-NFPA 70-2024 [Section No. 708.54(C)]

(C) Modifications.

If modifications, additions, or deletions to the critical operations power system(s) or the normal system supplying the critical operations power system load(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~~(C)~~ for an example of how critical operations power system OCPDs selectively coordinate with all supply-side OCPDs.

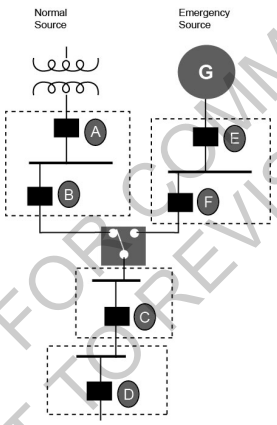
OCPD D selectively coordinates with OCPDs C, F, E, B, and A.

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(C) Critical Operations Power System Selective Coordination.



Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 20:26:10 EST 2024

Committee Statement

Committee Statement: The change was made to help enhance the safety and reliability of a critical operations power system by adding clarity to what overcurrent protective devices shall be reevaluated when replacements are made.

Also, the revision reaffirms the language in TIA. 23-11. This change removes the reference to Part C in the Informational Note and Figure in 708.54

Response Message: FR-8217-NFPA 70-2024

Public Input No. 4059-NFPA 70-2023 [Section No. 708.54(C)]

First Revision No. 8095-NFPA 70-2024 [Article 750]

see attached for legislatively correct changes

Article 750 Energy Management Systems

750.1 Scope.

This article applies to the installation and operation of energy management systems.

Informational Note: Performance provisions in other codes establish prescriptive requirements that may further restrict the requirements contained in this article.

750.6 Listing.

Energy management systems shall be one of the following:

(1) Listed as a complete energy management system

(2) Listed as a kit for field installation in switch or overcurrent device enclosures

(3) Listed individual components assembled as a system

750.20 Alternate Power Sources.

An energy management system shall not override any control necessary to ensure continuity of an alternate power source for the following:

(1) Fire pumps

(2) Health care facilities

(3) Emergency systems

(4) Legally required standby systems

(5) Critical operations power systems

750.30 Load Management.

Energy management systems shall be permitted to monitor and control electrical loads and sources in accordance with 750.30(A) through (C).

(A) Load Shedding Controls.

An energy management system shall not override the load shedding controls put in place to ensure the minimum electrical capacity for the following:

(1) Fire pumps

(2) Emergency systems

(3) Legally required standby systems

(4) Critical operations power systems

(B) Disconnection of Power.

An energy management system shall not cause disconnection of power to the following:

(1) Elevators, escalators, moving walks, or stairway lift chairs

(2) Positive mechanical ventilation for hazardous (classified) locations

(3) Ventilation used to exhaust hazardous gas or reclassify an area

(4) Circuits supplying emergency lighting

(5) Essential electrical systems in health care facilities

(C) Capacity of Branch Circuit, Feeder, or Service.

An energy management system shall not cause a branch circuit, feeder, or service to be overloaded. If an EMS is used to limit the current on a conductor, 750.30(C)(1) through (C)(4) shall apply:

(1) Current Setpoint.

A single value equal to the maximum ampere setpoint of the EMS shall be permitted for one or more of the following:

(1) For calculating the connected load per 220.70

(2) For the maximum source current permitted by EMS control

(2) System Malfunction.

The EMS shall use monitoring and controls to automatically cease current flow upon malfunction of the EMS.

(3) Settings.

Adjustable settings shall be permitted if access to the settings is accomplished by at least one of the following:

(1) Located behind removable and sealable covers over the adjustment means

(2) Located behind a cover or door that requires the use of a tool to open

(3) Located behind locked doors accessible only to qualified personnel

(4) Password protected with password accessible only to qualified personnel

(5) Software that has password protected access to the adjusting means accessible to qualified personnel only

(4) Marking.

The equipment that supplies the branch circuit, feeder, or service shall be field marked with the following information:

(1) Maximum current setting

(2) Date of calculation and setting

(3) Identification of loads and sources associated with the current limiting feature

(4) The following or equivalent wording: "The setting for the EMS current limiting feature shall not be bypassed"

The markings shall meet the requirements in 110.21(B) and shall be located such that they are clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

750.50 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.

Supplemental Information

File Name	Description	Approved
70_CMP_13_750_FR_8095.docx		
70_CMP_13_750_FR_8095.docx	For prod use	

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Fri Jan 19 11:54:41 EST 2024

Committee Statement

Committee Statement: In the 2023 NEC Cycle the requirements for EMS were consolidated from across the code into Article 750. Since this action was taken in the second draft stage, the article structure, technical changes, and revisions to clarify the requirements which apply to systems which provide overload control could not be completed.

This first revision revises the article into two parts where the general requirements that apply to all systems are located in Part I and the additional requirements which apply to EMS with overload control located in Part II.

The informational note in Section 750.1 was revised to clarify that requirements in other codes may be

additions instead of restrictions.

The listing requirements are moved to 750.2 in accordance with the NEC Style Manual. The list has been removed and replaced with simplified requirements that energy management equipment used in general systems (covered in Part I) must be listed and where used for overload control (covered in new Part II) the control equipment must have an additional PCS listing with marking. These revisions align with actions in the product safety standards addressing these systems and will ensure the device is suitable for the application.

The informational note is added to provide users with guidance to the relevant product standards, which may be referenced for further details on these products and systems.

Section 750.20 Alternate Power Sources is retained without modification.

Section 750.30 (A) and 750.30(B) are retained without modification.

Section 750.30(C) retained the first sentence with the remainder being moved and clarified in the new Part II. Part II addresses EMS which include overload control functions.

Section 750.50 on directories is moved into Part II section 750.80(C) with revisions applicable to EMS which include overload control. The phrase “through the use of a remote means” is removed to include the requirement for any installation where the EMS is not within sight of the overcurrent devices. The directory requirement for Part I EMS systems was removed since it is unnecessary for systems which do not provide overload control.

Part II is titled EMS for Overload Control to provide specific requirements for these systems.

New section 750.60(A) adds the general requirement that EMS used for overload control include monitoring and automatic control to prevent overloading of conductors and equipment within or connected to the system.

Section 750.60(B) is based on the existing requirement in 750.30(C)(2) System Malfunction. The revision addresses systems that can prevent overloading without a complete cessation of current flow. An informational note was added which provides common causes and examples of system malfunction.

Section 750.70 Current Setpoint is based on existing Section 750.30(C)(1) but was revised for clarity. The term “maximum” was removed since the system design will be

based on a defined setpoint which must comply with the restricted setting access requirements. The existing 750.30(C)(1)(1) was moved into an informational note to eliminate redundancy in requirements.

Section 750.70(B) Adjustable Settings is based on existing Section 750.30(C)(3). The requirements are reorganized and consolidated for clarity. Access to hardware settings is also included to address systems with this capability. An exception was added to permit the existing restricted access requirements in 240.6(C) and 240.6(D) for circuit breakers.

Section 750.80 Marking is based on existing Section 750.30(C)(4) but is revised to align with other revisions to the article and provide additional clarity. The identification of qualified personnel determining the settings and the date set was added to address complex systems requiring this level of detail. This requirement does not apply to one- and two-family dwellings since those applications are generally more limited. New marking language has been added to require this equipment be marked to notify users of the presence of the EMS with PCS, and to notify them that settings are restricted.

Section 750.80(B) adds documentation requirements to ensure the equipment information and settings associated with the EMS are readily available.

750.80(C) was moved from previous 750.50.

Response Message: FR-8095-NFPA 70-2024

Public Input No. 4291-NFPA 70-2023 [Article 750]

Public Input No. 2000-NFPA 70-2023 [Section No. 750.30(C)(4)]

Public Input No. 1939-NFPA 70-2023 [Section No. 750.30(C)(3)]

Public Input No. 2857-NFPA 70-2023 [Section No. 750.6]

Public Input No. 2856-NFPA 70-2023 [New Section after 750.1]

Public Input No. 1829-NFPA 70-2023 [Section No. 750.30(C) [Excluding any Sub-Sections]]

Public Input No. 4293-NFPA 70-2023 [Section No. 750.30(C)(3)]

Public Input No. 1811-NFPA 70-2023 [Section No. 750.6]

Public Input No. 4277-NFPA 70-2023 [Section No. 750.30(C)(2)]

Public Input No. 4372-NFPA 70-2023 [Section No. 750.6]

Public Input No. 4335-NFPA 70-2023 [Section No. 750.30]

Public Input No. 1936-NFPA 70-2023 [Section No. 750.30(C)(2)]

Public Input No. 4487-NFPA 70-2023 [Section No. 750.30(C)(2)]

70 CMP 13 750 FR 8095

Article 750 Energy Management Systems

Part I. General

750.1 Scope.

This article applies to the installation and operation of energy management systems.

Informational Note: Performance provisions in other codes may establish prescriptive requirements ~~that may further restrict~~in addition to the requirements contained in this article.

750.2~~6~~ Listing Requirements.

Energy management equipment~~systems~~ shall be listed. Equipment providing overload control as covered in Part II of this article shall be listed and labeled as a power control system (PCS).~~one of the following:~~

~~(1) Listed as a complete energy management system~~

~~(2) Listed as a kit for field installation in switch or overcurrent device enclosures~~

~~(3) Listed individual components assembled as a system~~

Informational Note: Evaluations of energy management equipment with PCS are different than evaluations of general energy management equipment. See UL 916, Energy Management Equipment, for information on listed energy management equipment, and UL 3141, Power Control Systems, for information on listed PCS equipment.

750.20 Alternate Power Sources.

An energy management system shall not override any control necessary to ensure continuity of an alternate power source for the following:

(1) Fire pumps
(2) Health care facilities
(3) Emergency systems
(4) Legally required standby systems
(5) Critical operations power systems

750.30 Load Management.

Energy management systems shall be permitted to monitor and control electrical loads and sources in accordance with 750.30(A) through (C).

(A) Load Shedding Controls.

An energy management system shall not override the load shedding controls put in place to ensure the minimum electrical capacity for the following:

(1) Fire pumps
(2) Emergency systems
(3) Legally required standby systems
(4) Critical operations power systems

(B) Disconnection of Power.

An energy management system shall not cause disconnection of power to the following:

(1) Elevators, escalators, moving walks, or stairway lift chairs
(2) Positive mechanical ventilation for hazardous (classified) locations
(3) Ventilation used to exhaust hazardous gas or reclassify an area
(4) Circuits supplying emergency lighting
(5) Essential electrical systems in health care facilities

(C) Capacity of Branch Circuit, Feeder, or Service.

An energy management system shall not cause a branch circuit, feeder, or service to be overloaded. ~~If an EMS is used to limit the current on a conductor, 750.30(C)(1) through (C)(4) shall apply:~~

Part II. EMS for Overload Control

750.50 General

Part II contains additional requirements for EMS which provide controls required to prevent the overloading of conductors and equipment through the use of a PCS.

750.60 Conductors and Equipment

(A) Monitoring and Controls.

The EMS with PCS shall include monitoring and automatic control devices to prevent overload of conductors and power distribution equipment associated with the EMS with PCS.

(B) Malfunction.

The EMS with PCS shall transition to a state that prevents overload in response to a failure or malfunction affecting the ability to monitor and control currents within the PCS.

Informational Note: Examples of failure or malfunction are operating conditions where the control system is not able to achieve or maintain the desired setpoint value. Equipment failure, delayed response, or the loss of control or feedback elements are common causes of system malfunction.

~~(1)~~750.70 Settings.

(A) Current Setpoint.

The EMS with PCS shall be capable of being set to a current setpoint in amperes for each controlled conductor, controlled source, or controlled load.

Informational Note: Current setpoints may be used for calculating the connected load(s) and or source(s). See 220.70 for application of an EMS with PCS setpoint used in load calculations.

(B) Adjustable Settings.

Adjustable settings for overload control functions shall be permitted if access to the settings is limited by at least one of the following:

1. Located behind locked doors accessible only to qualified personnel
2. Software that has password protected access to the adjusting means accessible to qualified personnel only
3. Hardware such as dip switches located behind locked doors or areas requiring a tool for access

Exception: Adjustable trip circuit breakers with restricted access, as allowed in 240.6(C) or 240.6(D), shall be permitted.

~~A single value equal to the maximum ampere setpoint of the EMS shall be permitted for one or more of the following:~~

~~(1) For calculating the connected load per 220.70~~
~~(2) For the maximum source current permitted by EMS control~~

~~**(2) System Malfunction.**~~

~~The EMS shall use monitoring and controls to automatically cease current flow upon malfunction of the EMS.~~

~~**(3) Settings.**~~

~~Adjustable settings shall be permitted if access to the settings is accomplished by at least one of the following:~~

~~(1) Located behind removable and sealable covers over the adjustment means~~
~~(2) Located behind a cover or door that requires the use of a tool to open~~
~~(3) Located behind locked doors accessible only to qualified personnel~~
~~(4) Password protected with password accessible only to qualified personnel~~
~~(5) Software that has password protected access to the adjusting means accessible to qualified personnel only~~

~~(4)~~750.80 Marking and Documentation.

(A) Marking.

The equipment that supplies the branch circuit, feeder, or service shall be ~~field~~ marked with the following information:

(1) Current setpoint(s)~~Maximum current setting~~

(2) In other than one- and two-family dwellings, the ~~D~~date of calculation ~~and setting~~ and identification of qualified personnel determining the settings

(3) Identification of loads and sources ~~associated with the current limiting feature~~managed by the EMS with PCS

(4) The following or equivalent wording: "Circuits within this equipment are controlled by a power control system. The current setpoints~~setting for the EMS current limiting feature~~ shall only be changed by a qualified person~~not be bypassed~~"

The markings shall meet the requirements in 110.21(B) and shall be located such that they are clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

(B) Documentation.

A list of the monitoring and control equipment and associated settings which perform the overload control functions shall be documented and readily available.

Informational Note: Listed EMS with PCS may include specific hardware and software components that are detailed in the documentation included with the listing.

~~750.50~~(C) Directory.

Where ~~an energy management system~~the EMS with PCS control equipment is not located within sight of the overcurrent device(s) for the controlled circuit(s) ~~is employed to control electrical power through the use of a remote means~~, a directory identifying the controlled device(s) and associated circuit(s) shall be posted on the enclosure of the control device(s)~~controller~~, disconnect, or branch-circuit overcurrent device.

First Revision No. 7641-NFPA 70-2024 [Part I.]

Part I. Availability and Reliability for Critical Operations Power Systems.

Critical operations power systems may support facilities with a variety of objectives that are vital to public safety. Often these objectives are of such critical importance that system downtime is costly in terms of economic losses, loss of security, or loss of mission. For those reasons, the availability of the critical operations power system, the percentage of time that the system is in service, is important to those facilities. Given a specified level of availability, the reliability and maintainability requirements are then derived based on that availability requirement.

Availability. Availability is defined as the percentage of time that a system is available to perform its function(s). Availability is measured in a variety of ways, including the following:

$$\text{Availability} = \frac{MTBF}{MTTF + MTTR} \quad \text{[F.1]}$$

where:

MTBF = mean time between failures

~~*MTTF* = mean time to failure~~

MTTR = mean time to repair

See Table F.1 for an example of how to establish required availability for critical operation power systems:

Table F.1 Availability for Critical Operation Power Systems

Availability	Hours of Downtime
0.9	876
0.99	87.6
0.999	8.76
0.9999	0.876
0.99999	0.0876
0.999999	0.00876
0.9999999	0.000876

Note: Based on a year of 8760 hours.

Availability of a system in actual operations is determined by the following:

(1) The frequency of occurrence of failures. Failures may prevent the system from performing its function or may cause a degraded effect on system operation. Frequency of failures is directly related to the system's level of reliability.

(2) The time required to restore operations following a system failure or the time required to perform maintenance to prevent a failure. These times are determined in part by the system's level of maintainability.

(3) The logistics provided to support maintenance of the system. The number and availability of spares, maintenance personnel, and other logistics resources (refueling, etc.) combined with the system's level of maintainability determine the total downtime following a system failure.

Reliability. Reliability is concerned with the probability and frequency of failures (or lack of failures). A commonly used measure of reliability for repairable systems is *MTBF*. The equivalent measure for nonrepairable items is *MTTF*. Reliability is more accurately expressed as a probability over a given duration of time, cycles, or other parameter. For example, the reliability of a power plant might be stated as 95 percent probability of no failure over a 1000-hour operating period while generating a certain level of power. Reliability is usually defined in two ways (the electrical power industry has historically not used these definitions):

(1) The duration or probability of failure-free performance under stated conditions

(2) The probability that an item can perform its intended function for a specified interval under stated conditions [For nonredundant items, this is equivalent to the preceding definition (1).

For redundant items, this is equivalent to the definition of mission reliability.]

Maintainability. Maintainability is a measure of how quickly and economically failures can be prevented through preventive maintenance, or system operation can be restored following failure through corrective maintenance. A commonly used measure of maintainability in terms of corrective maintenance is the mean time to repair (*MTTR*). Maintainability is not the same thing as maintenance. It is a design parameter, while maintenance consists of actions to correct or prevent a failure event.

Improving Availability. The appropriate methods to use for improving availability depend on whether the facility is being designed or is already in use. For both cases, a reliability/availability analysis should be performed to determine the availability of the old system or proposed new system in order to ascertain the hours of downtime (see the preceding table). The AHJ or government agency should dictate how much downtime is acceptable.

Existing facilities: For a facility that is being operated, two basic methods are available for improving availability when the current level of availability is unacceptable: (1) Selectively adding redundant units (e.g., generators, chillers, fuel supply) to eliminate sources of single-point failure, and (2) optimizing maintenance using a reliability-centered maintenance (RCM) approach to minimize downtime. (Refer to NFPA 70B-2019, *Recommended Practice for Electrical Equipment Maintenance*.) A combination of the previous two methods can also be implemented. A third very expensive method is to redesign subsystems or to replace components and subsystems with higher reliability items. *(Refer to NFPA 70B.)*

New facilities: The opportunity for high availability and reliability is greatest when designing a new facility. By applying an effective reliability strategy, designing for maintainability, and ensuring that manufacturing and commissioning do not negatively affect the inherent levels of reliability and maintainability, a highly available facility will result. The approach should be as follows:

(1) *Develop and determine a reliability strategy* (establish goals, develop a system model, design for reliability, conduct reliability development testing, conduct reliability acceptance testing, design system delivery, maintain design reliability, maintain design reliability in operation).

(2) *Develop a reliability program.* This is the application of the reliability strategy to a specific system, process, or function. Each step in the preceding strategy requires the selection and use of specific methods and tools. For example, various tools can be used to develop requirements or evaluate potential failures. To derive requirements, analytical models can be used, for example, quality function development (a technique for deriving more detailed, lower-level requirements from one level to another, beginning with mission requirements, i.e., customer needs). This model was developed as part of the total quality management movement. Parametric models can also be used to derive design values of reliability from operational values and vice versa. Analytical methods include but are not limited to things such as thermal analysis, durability analysis, and predictions. Finally, one should evaluate possible failures. A failure modes and effects criticality analysis (FMECA) and fault tree analysis (FTA) are two methods for evaluating possible failures. The mission facility engineer should determine which method to use or whether to use both.

(3) *Identify reliability requirements.* The entire effort for designing for reliability begins with identifying the mission critical facility's reliability requirements. These requirements are stated in a variety of ways, depending on the customer and the specific system. For a mission-critical facility, it would be the mission success probability.

Informational Note: For information regarding power system reliability, see IEEE 3006.5-2014, *Recommended Practice for the Use of Probability Methods for Conducting a Reliability Analysis of Industrial and Commercial Power Systems*.

Submitter Information Verification

Committee: NEC-P13

Submittal Date: Tue Jan 16 08:38:47 EST 2024

Committee Statement

Committee Statement: The revision corrects an error in the equation and MTTF is removed since it is no longer used in the equation.

Response Message: FR-7641-NFPA 70-2024

Public Input No. 370-NFPA 70-2023 [Part I.]