



National Fire Protection Association

1 Batterymarch Park, Quincy, MA 02169-7471
Phone: 617-770-3000 • Fax: 617-770-0700 • www.nfpa.org

WORKING DRAFT OF NEC CODE-MAKING **PANEL 9 MEETING OUTPUT**

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

Document: National Electrical Code®

Revision Cycle: A2025

Meeting Date: October 2024

Panel Activity: Comment Stage

This is a working draft, prepared by NFPA staff, to record the output generated at the Code-Making Panel 9 Second Draft Meeting. It includes draft copies of the Second 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 Second Draft Ballot.



Second Revision No. 8190-NFPA 70-2024 [Global Comment]

[See attached Word document for OCPD revisions in Article 268.]

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_SR8190_Overcurrent.docx		

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Mon Oct 21 16:48:01 EDT 2024

Committee Statement

Committee Statement: All instances of the term “overcurrent”, “overcurrent protective devices” and “overcurrent protection” were reviewed and changes were made to align proposed and currently defined terms. This action is related to the proposed revisions in PC-1649.

Response Message: SR-8190-NFPA 70-2024

268.70(F) Overcurrent Protective Devices as Disconnecting Means.

Where the circuit breaker or alternative for it, as specified in 268.91 for service ~~overcurrent devices~~ OCPDs, meets the requirements specified in 268.70(A) through 238.70(F), it shall constitute the service disconnecting means.

268.90(A) Ungrounded Conductor.

Such protection shall be provided by an ~~overcurrent device~~ OCPD in series with each ungrounded service conductor that has a rating or setting not higher than the ampacity of the conductor. For the purpose of this requirement, where single-pole ~~overcurrent devices~~ OCPDs are used on a multipole circuit, these devices shall be considered as one protective device.

268.90(B) Not in Grounded Conductor.

No ~~overcurrent device~~ OCPD shall be inserted in a grounded service conductor except a circuit breaker that simultaneously opens all conductors of the circuit.

268.91(B) Location.

A short-circuit protective device shall be provided and shall protect all ungrounded conductors that it supplies. The service ~~overcurrent device~~ OCPD shall be an integral part of the service disconnecting means or shall be located immediately adjacent thereto. Where fuses are used as the service ~~overcurrent device~~ OCPD, the disconnecting means shall be located ahead of the supply side of the fuses.

268.92 Locked Service Overcurrent Protective Devices.

Where the service ~~overcurrent devices~~ OCPDs are locked or sealed or are not readily accessible to the occupant, branch-circuit or feeder ~~overcurrent devices~~ OCPDs shall be installed on the load side, shall be mounted in a readily accessible location, and shall be of lower ampere rating than the service ~~overcurrent device~~ OCPD.

268.93 Protection of Specific Circuits.

Where necessary to prevent tampering, an automatic ~~overcurrent device~~ OCPD that protects service conductors supplying only a specific load shall be permitted to be locked or sealed. The lock or seal shall be located so as to be accessible.



Second Revision No. 8262-NFPA 70-2024 [Global Comment]

[See attached Word document for revisions of OCPDs in Article 450.]

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_CMP9_SR8262_OCPD.docx	Global SR-8262 OCPD on 450	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 14:33:46 EDT 2024

Committee Statement

Committee Statement: In article 450 all instances of the terms “overcurrent”, “overcurrent protective devices” and “overcurrent protection” were reviewed and revised to align with proposed and currently defined terms. This action is related to the proposed revisions in PC-1649.

Response Message: SR-8262-NFPA 70-2024

450.5 Overcurrent Protection.

Overcurrent protection of transformers shall comply with 450.5(A), 450.5(B), or 450.5(C). As used in this section, the word *transformer* shall mean a transformer or polyphase bank of two or more single-phase transformers operating as a unit.

Informational Note No. 1: See 240.4, 240.21, 245.26, and 245.27 for overcurrent protection of conductors.

Informational Note No. 2: Nonlinear loads can increase heat in a transformer without operating its ~~overcurrent-protective device~~OCPD. See IEEE 3002.8-2018, *Recommended Practice for Conducting Harmonic Studies and Analysis of Industrial and Commercial Power Systems*, for additional information.

450.5(A) Transformers Over 1000 Volts, Nominal.

Overcurrent protection shall be provided in accordance with Table 450.5(A).

Table 450.5(A) Maximum Rating or Setting of Overcurrent Protection for Transformers Over 1000 Volts (as a Percentage of Transformer-Rated Current)

[Table Not Shown]

¹Where the required fuse rating or circuit breaker setting does not correspond to a standard rating or setting, a higher rating or setting that does not exceed one of the following shall be permitted:

(1) The next higher standard rating or setting for fuses and circuit breakers in accordance with 240.6 for 1000 volts and below

(2) The next higher commercially available rating or setting for fuses and circuit breakers above 1000 volts

²Where secondary overcurrent protection is required, the secondary ~~overcurrent-device~~OCPD shall be permitted to consist of not more than six circuit breakers or six sets of fuses grouped in one location. Where multiple ~~overcurrent-devices~~OCPDs are utilized, the total of all the device ratings shall not exceed the allowed value of a single ~~overcurrent-device~~OCPD. If both circuit breakers and fuses are used as the ~~overcurrent-device~~OCPD, the total of the ~~device-OCPD~~ ratings shall not exceed that allowed for fuses.

³A supervised location is a location where conditions of maintenance and supervision ensure that only qualified persons monitor and service the transformer installation.

⁴Electronically actuated fuses that can be set to open at a specific current shall be set in accordance with settings for circuit breakers.

⁵A transformer equipped with a coordinated thermal overload protection by the manufacturer shall be permitted to have separate secondary protection omitted.

450.5(B) Transformers 1000 Volts, Nominal, or Less.

Overcurrent protection shall be provided in accordance with Table 450.5(B) unless the transformer is installed as a motor control circuit transformer in accordance with 430.72(C)(1) through 430.72(C)(5).

Table 450.5(B) Maximum Rating or Setting of Overcurrent Protection for Transformers 1000 Volts and Less (as a Percentage of Transformer-Rated Current)

[Table not Shown]

¹Where 125 percent of this current does not correspond to a standard rating of a fuse or nonadjustable circuit breaker, in accordance with 240.6, a higher rating that does not exceed the next higher standard rating shall be permitted.

²Where secondary overcurrent protection is required, the secondary ~~overcurrent-device~~OCPD shall be permitted to consist of not more than six circuit breakers or six sets of fuses grouped in one location. Where multiple ~~overcurrent-devices~~OCPDs are utilized, the total of all the device ratings shall not exceed the allowed value of a single ~~overcurrent-device~~OCPD.

³A transformer equipped with coordinated thermal overload protection by the manufacturer and arranged to interrupt the primary current shall be permitted to have a primary overcurrent-protection OCPD rated or set at a current value that is not more than six times the rated current of the transformer for transformers having not more

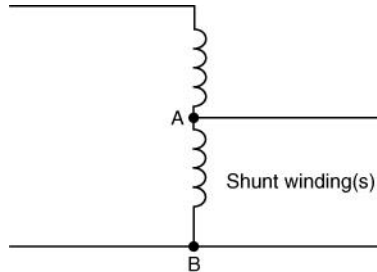
than 6 percent impedance and not more than four times the rated current of the transformer for transformers having more than 6 percent but not more than 10 percent impedance.

450.6 Autotransformers 1000 Volts, Nominal, or Less.

(A) Overcurrent Protection.

Each autotransformer 1000 volts, nominal, or less shall be protected by an individual ~~overcurrent device~~OCPD installed in series with each ungrounded input conductor. Such an ~~overcurrent device~~OCPD shall be rated or set at not more than 125 percent of the rated full-load input current of the autotransformer. Where this calculation does not correspond to a standard rating of a fuse or nonadjustable circuit breaker and the rated input current is 9 amperes or more, the next higher standard rating described in 240.6 shall be permitted. An ~~overcurrent device~~OCPD shall not be installed in series with the shunt winding (the winding common to both the input and the output circuits) of the autotransformer between Point A and Point B as shown in Figure 450.6(A).

Figure 450.6(A) Autotransformer.



Exception: Where the rated input current of the autotransformer is less than 9 amperes, an ~~overcurrent device~~OCPD rated or set at not more than 167 percent of the input current shall be permitted.

450.7(A)(1) Connections.

The transformer shall be directly connected to the ungrounded phase conductors and shall not be switched or provided with ~~overcurrent protection~~an OCPD that is independent of the main switch and common-trip ~~overcurrent protection~~OCPD for the 3-phase, 4-wire system.

450.7(A)(2) Overcurrent Protection.

An overcurrent sensing device shall be provided that will cause the main switch or common-trip ~~overcurrent protection~~OCPD referred to in 450.7(A)(1) to open if the load on the autotransformer reaches or exceeds 125 percent of its continuous current per-phase or neutral rating. Delayed tripping for temporary overcurrents sensed at the autotransformer ~~overcurrent device~~OCPD shall be permitted for the purpose of allowing proper operation of branch or feeder ~~protective devices~~OCPDs on the 4-wire system.

450.7(A)(3) Transformer Fault Sensing.

A fault-sensing system that causes the opening of a main switch or common-trip ~~overcurrent device~~OCPD for the 3-phase, 4-wire system shall be provided to guard against single-phasing or internal faults.

Informational Note: This can be accomplished by the use of two subtractive-connected donut-type current transformers installed to sense and signal when an unbalance occurs in the line current to the autotransformer of 50 percent or more of rated current.

450.7(B)(2) Overcurrent Protection.

Overcurrent protection shall comply with 450.7(B)(2)(a) and 450.7(B)(2)(b).

- (a) *Operation and Interrupting Rating.* An ~~overcurrent protective device~~OCPD having an interrupting rating in compliance with 110.9 and that will open simultaneously all ungrounded conductors when it operates shall be applied in the grounding autotransformer branch circuit.
- (b) *Ampere Rating.* The ~~overcurrent protection~~OCPD shall be rated or set at a current not exceeding 125 percent of the autotransformer continuous per-phase current rating or 42 percent of the continuous-current rating of any series-connected devices in the autotransformer neutral connection. Delayed tripping for temporary overcurrents to permit the proper operation of ground-responsive tripping devices on the main system shall be permitted but shall not exceed values that would be more than the short-time current rating of the grounding autotransformer or any series connected devices in the neutral connection thereto.

Exception: For high-impedance grounded systems covered in 250.36, where the maximum ground-fault current is designed to be not more than 10 amperes, and where the grounding autotransformer and the grounding impedance are rated for continuous duty, an ~~overcurrent device~~OCPD rated not more than 20 amperes that will simultaneously open all ungrounded conductors shall be permitted to be installed on the line side of the grounding autotransformer.

450.8(B) Overcurrent Protection for Secondary Connections.

Where secondary ties are used, an ~~overcurrent device~~OCPD rated or set at not more than 250 percent of the rated secondary current of the transformers shall be provided in the secondary connections of each transformer supplying the tie system. In addition, an automatic circuit breaker actuated by a reverse-current relay set to open the circuit at not more than the rated secondary current of the transformer shall be provided in the secondary connection of each transformer.

450.9 Parallel Operation.

Transformers shall be permitted to be operated in parallel and switched as a unit if the overcurrent protection for each transformer meets the requirements of 450.5(A) for primary and secondary ~~protective devices~~OCPDs over 1000 volts, or 450.5(B) for primary and secondary ~~protective devices~~OCPDs 1000 volts or less.

450.23(A) Indoor Installations.

Indoor installations shall be permitted in accordance with one of the following:

- (1) In Type I or Type II buildings, in areas where all of the following requirements are met:

- a. The transformer is rated 35,000 volts or less.
- b. No combustible materials are stored.
- c. A liquid confinement area is provided.
- d. The installation complies with all the restrictions provided for in the listing of the liquid.

Informational Note: Such restrictions can include, but are not limited to, maximum pressure of the tank, use of a pressure relief valve, appropriate fuse types, and proper sizing of ~~overcurrent protection~~the OCPD.

- (2) If an automatic fire extinguishing system and a liquid confinement area is present, provided the transformer is rated 35,000 volts or less
- (3) If the installation complies with 450.26

450.23(B) Outdoor Installations.

Less-flammable liquid-filled transformers shall be permitted to be installed outdoors, attached to, adjacent to, or on the roof of buildings, if installed in accordance with either of the following:

- (1) For Type I and Type II buildings, the installation shall comply with all the restrictions provided for in the listing of the liquid.

Informational Note No. 1: See NFPA 220-2024, *Standard on Types of Building Construction*, for definitions of Type I and Type II building construction.

Informational Note No. 2: Such restrictions can include, but are not limited to, maximum pressure of the tank, use of a pressure relief valve, appropriate fuse types, and proper sizing of ~~overcurrent protection~~the OCPD.

- (2) In accordance with 450.27.

Informational Note No. 3: See 450.27 for examples of additional safeguards that can be required for installations adjacent to combustible material, fire escapes, or door and window openings.



Second Revision No. 8177-NFPA 70-2024 [Detail]

[This revision add a new Part title to Article 267. This revision is to come before 267.1 Scope.]

Part I. General

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:09:26 EDT 2024

Committee Statement

Committee Statement: Article 237 has a Part II, but no title for Part I. A title was added to Part I to make the Article complete.

Response Message: SR-8177-NFPA 70-2024

Public Comment No. 1402-NFPA 70-2024 [New Section after 267.1]



Second Revision No. 8246-NFPA 70-2024 [Detail]

[See attached Word document for revisions to 315.17(B).]

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Ballotable_Detail_SR-8246_on_315.17_B_.docx	Ballotable Detail SR-8246 on 315.17(B)	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 12:47:29 EDT 2024

Committee Statement

Committee Statement: This change provides additional clarity and direction for a manufacturer to supply a field applied tag to be installed at a suitable location.

Response Message: SR-8246-NFPA 70-2024

Public Comment No. 1759-NFPA 70-2024 [Section No. 315.17(B)]

Ballotable Detail SR-8246 on 315.17(B)

(B) Method of Marking for Type MV Cable Joints, Terminations, and Connectors.

One or both of the methods in 315.17(B)(1) or 315.17(B)(2) shall be used for the marking of cable joints, terminations, or connectors.

(1) Surface Marking.

Type MV cable joints, terminations, or connectors shall be durably marked on the surface.

(2) Tag Marking.

Type MV cable joints, terminations, or connectors shall be ~~marked by means of a durably provided with a durably printed tag or label, by the manufacturer to be attached~~ field applied to the joints, terminations, connectors, joint or termination, or to the cable where the accessory is installed.



Second Revision No. 8249-NFPA 70-2024 [Detail]

[See attached Word document for revisions to 315.17(C).]

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Ballotable_Detail_SR-8249_on_315.17_C_.docx	Ballotable Detail SR-8249 on 315.17(C)	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 13:09:51 EDT 2024

Committee Statement

Committee Statement: This revision clarifies the type of marking methods to be used when using optional additional markings.

Response Message: SR-8249-NFPA 70-2024

Public Comment No. 1762-NFPA 70-2024 [Section No. 315.17(C)]

(C) Optional Additional Markings.

Type MV cable joints and cable terminations shall be permitted to be marked to indicate special characteristics, such as limited smoke and sunlight resistance, using one of the methods

in 315.17(B)(1) or 315.17(B)(2).



Second Revision No. 8291-NFPA 70-2024 [Detail]

[Revise title to add "substations" to the Part III title, as shown.] Located right before 495.30

Part III. Equipment — Switchgear, Substations, and Industrial Control Assemblies

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 18:11:23 EDT 2024

Committee Statement

Committee Statement: Substations was added to the title since substations are under the scope of Part III.

Response Message: SR-8291-NFPA 70-2024



Second Revision No. 8483-NFPA 70-2024 [Detail]

[Add the below defined terms to Article 100.]

Equipment, Portable (portable equipment). (as applied to equipment over 1000 volts ac or 1500 volts dc)

Equipment intended to be disconnected, moved to a different location, and reconnected in that location. (CMP-9)

Equipment, Mobile (mobile equipment). (as applied to equipment over 1000 volts ac or 1500 volts dc)

Equipment, at least a portion of which is intended to move or be moved from place to place during operation. (CMP-9)

Platform, Portable (portable platform). (as applied to equipment over 1000 volts ac or 1500 volts dc)

A means of providing access to equipment which is capable of being relocated if required, and which provides access for the task(s) to be performed on that equipment. (CMP-9)

Informational Note: See NFPA 70E, *Standard for Electrical Safety in the Workplace*, and OSHA 1926.955, *Portable Ladders and Platforms*, for safety information.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Fri Oct 25 01:39:26 EDT 2024

Committee Statement

Committee Statement: This revision adds definitions for Portable Equipment and Portable Platform which align with their usage in the context of equipment over 1000V. Previously, there were only definition in the Code which did not address the specific usage of equipment over 1000 VAC or 1500 VDC, such as Articles 450 and 495. This revision is related to PC-63.

Response Message: SR-8483-NFPA 70-2024



305.27 Number and Size of Conductors and Cables in Raceway.

~~The number and size of conductors and cables in any raceway shall not be more than will permit dissipation of the heat and ready installation or withdrawal of the conductors or cables without damage to the conductors or cables, or to their insulation.~~

(A) Raceway Fill .

The number and size of conductors and cables in any raceway shall not be more than will permit dissipation of the heat and ready installation or withdrawal of the conductors or cables without damage to the conductors or cables, or to their insulation.

~~305.1 (G) (B)~~ Metric Designators and Trade Sizes. [Move 305.1(C) to appear as 305.27(B)]

Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be in accordance with Table ~~305.1(C)~~ 305.27(B) ~~305.1(G)~~ .

Table ~~305.1(C)~~ 305.27(B) Metric Designators and Trade Sizes

Metric Designator	Trade Size
12	3/8
16	1/2
21	3/4
27	1
35	1 1/4
41	1 1/2
53	2
63	2 1/2
78	3
91	3 1/2
103	4
129	5
155	6

Note: The metric designators and trade sizes shall be for identification purposes only and are not actual dimensions.

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_SR8601_305.1_C_.docx		
70_Detail_SR8601_305.1_C_CMP-9.docx	For prod use	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 28 11:28:48 EDT 2024

Committee Statement

Committee Statement: The Scope of 305.1 is not the proper location for this mandatory requirement. Relocating this requirement and the table to 305.27(B) brings this section into compliance with the NEC Style Manual 2.1.4.4

Response Message: SR-8601-NFPA 70-2024

[Public Comment No. 1396-NFPA 70-2024 \[Section No. 305.27\]](#)

[Public Comment No. 1394-NFPA 70-2024 \[Section No. 305.1\(C\)\]](#)

305.27 Number and Size of Conductors and Cables in Raceway.

(A) Raceway Fill.

The number and size of conductors and cables in any raceway shall not be more than will permit dissipation of the heat and ready installation or withdrawal of the conductors or cables without damage to the conductors or cables, or to their insulation.

[Move 305.1(C) to appear as 305.27(B).]

305.1(C)(B) Metric Designators and Trade Sizes.

Metric designators and trade sizes for conduit, tubing, and associated fittings and accessories shall be in accordance with Table 305.27(B)~~305.1(C)~~.

Table ~~305.1(C)~~305.27(B) Metric Designators and Trade Sizes

Metric Designator	Trade Size
12	3/8
16	1/2
21	3/4
27	1
35	1 1/4
41	1 1/2
53	2
63	2 1/2
78	3
91	3 1/2
103	4
129	5
155	6

Note: The metric designators and trade sizes shall be for identification purposes only and are not actual dimensions.



Second Revision No. 8131-NFPA 70-2024 [Section No. 245.2]

245.2 Listing Requirements.

(A) Overcurrent Protective Devices Rated Not Over 15,000 Volts.

Overcurrent protection for systems rated not over 1000- 15000 volts ac , ~~1500 volts~~ or dc, nominal, shall be listed. The listing requirements shall be effective January 1, 2029.

Exception: Overcurrent protection that is integral to a listed assembly shall not be required to be individually listed.

(B) Overcurrent Protective Devices Rated Over 15,000 Volts

Overcurrent protection for systems rated over 15000 volts ac or dc, nominal,

and

but not over

15

52 ,000 volts ac or dc, nominal, shall be listed.

The

This listing requirements shall be effective January 1,

2029

2032 .

Exception: Overcurrent protection that is integral to a listed assembly shall not be required to be individually listed.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 12:25:03 EDT 2024

Committee Statement

Committee Statement: Listing requirements for OCPD's were added to assist AHJ's and other interested parties in approving equipment in accordance with 110.2 & 110.3. Future effective dates were added to allow compliance.

Response Message: SR-8131-NFPA 70-2024

Public Comment No. 1324-NFPA 70-2024 [Section No. 245.2]

Public Comment No. 1333-NFPA 70-2024 [Section No. 245.2]



Second Revision No. 8134-NFPA 70-2024 [Section No. 245.3]

245.3 Reconditioned Equipment.

(A) Permitted to be Installed.

The installation of the following reconditioned equipment shall be permitted- ~~to be installed~~ :

- (1) Medium- and high-voltage circuit breakers
- (2) Electromechanical protective relays and current transformers

(B) Not Permitted to be Installed.

~~Reconditioned medium~~ The installation of the following reconditioned equipment shall not be permitted:

- (1) Medium - and high-voltage fuseholders- ~~and medium~~
- (2) Medium - and high-voltage nonrenewable fuses- ~~shall not be installed.~~

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 12:43:56 EDT 2024

Committee Statement

Committee Statement: The text was editorially revised to correlate with the recommendation from the CC.

Response Message: SR-8134-NFPA 70-2024

Public Comment No. 117-NFPA 70-2024 [Section No. 245.3]



Second Revision No. 8135-NFPA 70-2024 [Section No. 245.21(C)(1)]

(1) Installation.

Cutouts shall be located so that they ~~may be readily and safely~~ are accessible to be operated and re-fused, and so that the exhaust of the fuses does not endanger persons. Distribution cutouts shall not be used indoors, underground, or in metal enclosures.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 12:48:48 EDT 2024

Committee Statement

Committee Statement: Since it is unenforceable language, this revision deletes "may be readily and safely" and adopts "are accessible to be." This change maintains the current requirement but with enforceable language that aligns with the NEC style manual.

Response Message: SR-8135-NFPA 70-2024

[Public Comment No. 72-NFPA 70-2024 \[Section No. 245.21\(C\)\(1\)\]](#)

[Public Comment No. 118-NFPA 70-2024 \[Section No. 245.21\(C\)\]](#)



Second Revision No. 8136-NFPA 70-2024 [Section No. 245.21(C)(2)]

(2) Operation.

Where fused cutouts are not ~~suitable~~ rated to interrupt circuits manually while carrying load, the installation shall comply with 245.21(C)(2)(a) through 245.21(C)(2)(c).

(a) An approved means shall be installed to interrupt the load.

Exception: A permanently installed additional means to interrupt the load is not required where documented switching procedures are provided for qualified personnel to remove the load before operating the fused cutouts. The use of load-removal tools shall be permitted.

(b) A conspicuous sign shall be placed at the fused cutouts identifying that they shall not be operated under load.

(c) Access to any permanently installed operating means of the fused cutouts by unqualified persons shall be prohibited by lock or location.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 12:51:17 EDT 2024

Committee Statement

Committee Statement: The term "suitable" was replaced with "rated" to make the requirement enforceable.

Response Message: SR-8136-NFPA 70-2024

[Public Comment No. 70-NFPA 70-2024 \[Section No. 245.21\(C\)\(2\)\]](#)

[Public Comment No. 310-NFPA 70-2024 \[Section No. 245.21\(C\)\(2\)\]](#)



Second Revision No. 8137-NFPA 70-2024 [Section No. 245.21(C)(7)]

(7) Structure Mounted Outdoors.

The height of cutouts mounted outdoors on structures shall provide ~~safe~~ clearance between lowest energized parts ~~(open or closed position)~~ and standing surfaces, in accordance with 110.34(E). Clearance shall be maintained with the cutouts in both the open and closed position.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 12:53:08 EDT 2024

Committee Statement

Committee Statement: The term "safe" was removed, as it is unenforceable and vague (3.2.1 of the NEC Style Manual), the requirement was revised to not use the parenthetical phrase. "(open or closed position)", as parenthetical expressions should be avoided (3.5.1.1 of the NEC Style Manual). The changes proposed are not intended to change the intent of the requirement.

Response Message: SR-8137-NFPA 70-2024

Public Comment No. 71-NFPA 70-2024 [Section No. 245.21(C)(7)]



Second Revision No. 8140-NFPA 70-2024 [Section No. 245.27(B)]

(B) Feeder Taps.

Conductors tapped to a feeder shall be permitted to be protected by the feeder ~~overcurrent device where that overcurrent device also~~ OCPD where that OCPD also protects the tap conductor.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 13:06:33 EDT 2024

Committee Statement

Committee Statement: The term "overcurrent device" has been revised to "OCPD" to align with the definition for "over current protective device". This is related to the proposed revisions of PC-1649.

Response Message: SR-8140-NFPA 70-2024

[Public Comment No. 1649-NFPA 70-2024 \[Global Input\]](#)



Second Revision No. 8169-NFPA 70-2024 [Section No. 265.18]

265.18 Rating.

Branch circuits recognized by this article shall be rated in accordance with the maximum permitted ampere rating or setting of the ~~overcurrent device~~ OCPD . Where conductors of higher ampacity are used for any reason, the ampere rating or setting of the specified ~~overcurrent device shall~~ OCPD shall determine the circuit rating.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 14:31:45 EDT 2024

Committee Statement

Committee Statement: Updated "overcurrent device" to OCPD to align with the recommendations of PC-1649.

Response Message: SR-8169-NFPA 70-2024



Second Revision No. 8164-NFPA 70-2024 [Section No. 265.19]

265.19 Conductors — Minimum Ampacity and Size.

The ampacity of conductors shall be in accordance with 310.14 and 315.60, as applicable. Branch-circuit conductors shall be sized in accordance with 265.19(A) or 265.19(B).

(A) General.

The ampacity of branch-circuit conductors shall not be less than 125 percent of the designed potential load of utilization equipment that will be operated simultaneously.

(B) Supervised Installations.

~~Branch~~ For supervised installations, branch -circuit conductor sizing shall be permitted to be determined by qualified persons under engineering supervision. Supervised installations shall be considered to be those portions of a facility where ~~installation, maintenance, monitoring, and servicing the system are performed by qualified~~ all of the following are met:

(1) The design of the installation is provided under engineering supervision.

(2) Qualified persons with documented training and experience in ~~systems of over 1000 volts~~ volt ac or 1500 ~~volts de~~ volt dc systems install the system and provide ongoing maintenance, monitoring, and servicing of the system .

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
SR-8164_on_265.19.docx	SR-8164 on 265.19	
NEC_CMP-9_SR-8164_265.19.docx	For prod use	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 14:11:36 EDT 2024

Committee Statement

Committee Statement: This revision is in accordance with 3.5.5 of the NEC Style Manual, so that the requirements use parallel construction for consistency.

Response Message: SR-8164-NFPA 70-2024

Public Comment No. 77-NFPA 70-2024 [Section No. 265.19]

SR-8164 on 265.19(B)

(B) Supervised Installations.

~~Branch-~~For supervised installations, branch-circuit conductor sizing shall be permitted to be determined by qualified persons under engineering supervision. Supervised installations shall be ~~considered to be those portions of a facility where installation, maintenance, monitoring, and servicing the system are performed by qualified persons with documented training and experience in systems of over 1000 volts ac or 1500 volts dc.~~ all the following conditions are met:

- (1) The design of the installation is provided under engineering supervision.
- (2) Qualified persons with documented training and experience in over 1000-volt ac or 1500-volt dc systems install the system and provide ongoing maintenance, monitoring, and servicing of the system.

Commented [SH1]: PC No. 77

Panel Action: Accept

Statement: 265.19(B) was revised in accordance with 3.5.5 of the NEC Style Manual, so that the requirements use parallel construction for consistency.



Second Revision No. 8167-NFPA 70-2024 [Section No. 265.20]

265.20 Overcurrent Protection.

Branch-circuit conductors and equipment shall be protected by ~~overcurrent protective devices~~ OCPDs that have a rating or setting that complies with 265.20(A) through 265.20(C).

(A) ~~Continuous and Noncontinuous~~ Simultaneous Loads.

~~Where a branch circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device~~ The rating or setting of the OCPD shall not be less than ~~the noncontinuous load plus 125 percent of the continuous load~~.

~~Exception: Where the assembly, including the overcurrent devices protecting the branch circuit(s), is listed for operation at 100 percent of its rating, the ampere rating of the overcurrent device shall be permitted to be not less than the sum of the continuous load plus the noncontinuous load~~

100 percent of the sum of all loads on the branch circuit that will be operated simultaneously.

(B) Conductor Protection.

Conductors shall be protected in accordance with the ampacities specified in ~~310~~ 265 , ~~14 or 315.60~~ , ~~as applicable~~ 19.

(C) Equipment.

The rating or setting of the overcurrent protective device shall not exceed that specified in the applicable articles referenced in Table 240.3 for equipment.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-9_SR-8167_265.20.docx		

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 14:25:34 EDT 2024

Committee Statement

Committee Statement: Requirements for overcurrent protection are revised to address the fact that MV equipment is rated for operation at 100% of its rating (as opposed to LV equipment, where the default is 80%). The load criteria for selecting the minimum overcurrent device rating or setting were also changed from “Continuous and Non-Continuous” criteria to “Simultaneous Loads” criteria to reflect MV practices. This revision also changes “overcurrent device” to OCPD to align with the recommendation of PC-1649.

Response Message: SR-8167-NFPA 70-2024

Public Comment No. 76-NFPA 70-2024 [Section No. 265.20]

265.20 Overcurrent Protection.

Branch-circuit conductors and equipment shall be protected by ~~overcurrent protective devices~~OCPDs that have a rating or setting that complies with 265.20(A) through 265.20(C).

(A) ~~Continuous and Noncontinuous Simultaneous~~ Loads.

~~The rating or setting of the OCPD shall not be less than 100 percent of the sum of all loads on the branch circuit that will be operated simultaneously. Where a branch circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device shall not be less than the noncontinuous load plus 125 percent of the continuous load.~~

~~Exception: Where the assembly, including the overcurrent devices protecting the branch circuit(s), is listed for operation at 100 percent of its rating, the ampere rating of the overcurrent device shall be permitted to be not less than the sum of the continuous load plus the noncontinuous load.~~

(B) Conductor Protection.

Conductors shall be protected in accordance with the ampacities specified in ~~310.14 or 315.60, as applicable~~265.19.

(C) Equipment.

The rating or setting of the overcurrent protective device shall not exceed that specified in the applicable articles referenced in Table 240.3 for equipment.



Second Revision No. 8174-NFPA 70-2024 [Section No. 266.4(C)]

(C) Supervised Installations.

~~Feeder-~~ For supervised installations, ~~feeder~~ conductor sizing shall be permitted to be determined by qualified persons under engineering supervision ~~- in accordance with 310.14(B) or 315.60(B) -~~ Supervised installations ~~are~~ shall be considered to be those portions of a facility where ~~installation, maintenance, monitoring, and servicing the system is performed by qualified~~ all of the following are met:

(1) The design of the installation is provided under engineering supervision.

(2) Qualified persons with documented training and experience in ~~systems of~~ over 1000 volt ac or 1500 volt dc ~~systems install the system and provide the ongoing maintenance, monitoring, and servicing of the system .~~

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-9_SR-8174_266.4_C_.docx		

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 14:39:04 EDT 2024

Committee Statement

Committee Statement: This language is revised in accordance with 3.5.5 of the NEC Style Manual, so that the requirements use parallel construction for consistency.

Response Message: SR-8174-NFPA 70-2024

Public Comment No. 79-NFPA 70-2024 [Section No. 266.4(C)]

(C) Supervised Installations.

~~Feeder~~ For supervised installations, feeder conductor sizing shall be permitted to be determined by qualified persons under engineering supervision ~~in accordance with 310.14(B) or 315.60(B).~~ Supervised installations ~~are shall be~~ considered to be those portions of a facility where ~~installation, maintenance, monitoring, and servicing the system is performed by qualified persons with documented training and experience in systems of over 1000 volt ac or 1500 volt dc~~ all of the following are met:-

(1) The design of the installation is provided under engineering supervision.

(2) Qualified persons with documented training and experience in systems of over 1000 volt ac or 1500 volt dc ~~systems install the system and provide the ongoing maintenance, monitoring, and servicing of the system.~~



Second Revision No. 8172-NFPA 70-2024 [Section No. 266.5]

266.5 Overcurrent Protection.

Feeders shall be ~~protected against~~ provided with overcurrent ~~in~~ protection in accordance with 245.26 and 245.27. The rating or setting of the ~~overcurrent device shall~~ OCPD shall not be less than 100 percent of the sum of all loads that will be operated simultaneously.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 14:34:37 EDT 2024

Committee Statement

Committee Statement: All instances of the term “overcurrent”, “overcurrent protective devices” and “overcurrent protection” were reviewed and changes were made to align proposed and currently defined terms. This aligns with proposed actions on PC-1649.

Response Message: SR-8172-NFPA 70-2024



Second Revision No. 8179-NFPA 70-2024 [Section No. 267.31(I)]

(I) Disconnection of Grounded Conductor in a Grounded System.

Where the building or structure disconnecting means does not disconnect the grounded conductor from the grounded conductors in the building or structure wiring, other means shall be provided for this purpose at the location of the disconnecting means. A terminal or bus to which all grounded conductors can be attached by means of pressure connectors shall be permitted for this purpose.

In a multisection switchgear, disconnects for the grounded conductor shall be permitted to be in any section of the ~~switchboard or switchgear~~ if ~~the switchboard~~ the switchgear section or ~~switchgear section~~ is marked to indicate a grounded conductor disconnect is contained within the equipment.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:24:26 EDT 2024

Committee Statement

Committee Statement: Since switchboards are only used in installations below 1000 volts, the inclusion of switchboards in this section is not applicable and have been deleted.

Response Message: SR-8179-NFPA 70-2024

Public Comment No. 80-NFPA 70-2024 [Section No. 267.31(I)]



Second Revision No. 8180-NFPA 70-2024 [Section No. 267.39(C)]

(C) Supervised Installations.

For supervised installations, the rating of the disconnect shall be permitted to be determined by qualified persons under engineering supervision. The rating shall not be less than the size of the feeder or branch circuit supplying the disconnect. Supervised installations ~~are~~ shall be considered to be those portions of a facility where all of the following conditions as met:

- (1) The design of the installation is provided under engineering supervision.
- (2) Qualified persons with documented training and experience in over 1000 volt ~~systems~~ make the installation and ~~ac or over 1500 volt dc systems install the system and~~ provide the ongoing maintenance, monitoring, and servicing of the system.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:25:48 EDT 2024

Committee Statement

Committee Statement: Similar requirements appear in 265.19, 266.4, 268.23, 268.31, and 268.42, but those requirements indicate in list item (2) that the qualified person shall have "training" in addition to "experience". "Training" is added here for consistency, as well as the voltage demarcation of 1000 Vac, 1500 Vdc.

Response Message: SR-8180-NFPA 70-2024

Public Comment No. 1326-NFPA 70-2024 [Section No. 267.39(C)]



Second Revision No. 8182-NFPA 70-2024 [Section No. 268.23(C)]

(C) Supervised Installations.

For supervised installations, service conductor sizing shall be permitted to be determined by qualified persons under engineering supervision. Supervised installations ~~are~~ shall be considered to be those portions of a facility where all of the following conditions are met:

- (1) The design of the installation is provided under engineering supervision.
- (2) Qualified persons with documented training and experience in over 1000 volt ac, 1500 volt dc systems install the system and provide the ongoing maintenance, monitoring, and servicing of the system.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:33:51 EDT 2024

Committee Statement

Committee Statement: Similar requirements appear in 267.39, 266.4, 267.39, 268.31, and 268.42, but those requirements indicate in list item (2) that the maintenance, monitoring, and servicing shall be "ongoing". "Ongoing" is added here for consistency, as well as the voltage demarcation of 1000 Vac, 1500 Vdc.

Response Message: SR-8182-NFPA 70-2024

Public Comment No. 1327-NFPA 70-2024 [Section No. 268.23(C)]



Second Revision No. 8183-NFPA 70-2024 [Section No. 268.31(C)]

(C) Supervised Installations.

For supervised installations, service conductor sizing shall be permitted to be determined by qualified persons under engineering supervision- ~~in accordance with 310.14(B) or 315.60(B)~~ - Supervised installations ~~are~~ shall be considered to be those portions of a facility where all of the following conditions are met:

- (1) The design of the installation is provided under engineering supervision.
- (2) Qualified persons with documented training and experience in over 1000 volt ac, 1500 volt dc systems install the system and provide the ongoing maintenance, monitoring, and servicing of the system.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:37:56 EDT 2024

Committee Statement

Committee Statement: Similar requirements appear in 265.19, 266.4, 267.39, 268.23, and 268.42, but those requirements indicate in list item (2) that the maintenance, monitoring, and servicing shall be "ongoing". "Ongoing" is added here for consistency, as well as the voltage demarcation of 1000 Vac, 1500 Vdc. The reference to 310.14(B) and 315.60(B) is unnecessary, as permission is already granted in those sections for "alternative designs".

Response Message: SR-8183-NFPA 70-2024

Public Comment No. 1329-NFPA 70-2024 [Section No. 268.31(C)]



Second Revision No. 8184-NFPA 70-2024 [Section No. 268.33]

268.33 Spliced Conductors.

Service conductors shall be permitted to be spliced or tapped in accordance with 110.14 ~~40~~ , 268.46, ~~and~~ 305.15(D), 305.23, and 305.25.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:40:30 EDT 2024

Committee Statement

Committee Statement: With expanded requirements in Articles 110 and 305, references to the "low voltage" requirements were replaced with the equivalent requirements written for installations over 1000 Vac, 1500 Vdc.

Response Message: SR-8184-NFPA 70-2024

[Public Comment No. 81-NFPA 70-2024 \[Section No. 268.33\]](#)



Second Revision No. 8185-NFPA 70-2024 [Section No. 268.42(C)]

(C) Supervised Installations.

For supervised installations, service entrance conductor sizing shall be permitted to be determined by qualified persons under engineering supervision ~~in accordance with 310.14(B) or 315.60(B)~~. ~~Supervised installations are~~. Supervised installations shall be considered to be those portions of a facility where all of the following conditions are met:

- (1) The design of the installation is provided under engineering supervision.
- (2) Qualified persons with documented training and experience in over 1000 volt ac, 1500 volt dc systems install the system and provide the ongoing maintenance, monitoring, and servicing of the system.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:41:40 EDT 2024

Committee Statement

Committee Statement: Similar requirements appear in 265.19, 266.4, 267.39, 268.23, and 268.31, but those requirements indicate in list item (2) that the maintenance, monitoring, and servicing shall be "ongoing". "Ongoing" is added here for consistency, as well as the voltage demarcation of 1000 Vac, 1500 Vdc. The reference to 310.14(B) and 315.60(B) is unnecessary, as permission is already granted in those sections for "alternative designs"

Response Message: SR-8185-NFPA 70-2024

Public Comment No. 1330-NFPA 70-2024 [Section No. 268.42(C)]



Second Revision No. 8188-NFPA 70-2024 [Section No. 268.46]

268.46 Spliced and Tapped Conductors.

Service-entrance conductors shall be permitted to be spliced or tapped in accordance with 110.~~44~~ 40 , 305.15(D), ~~300~~ 305 .~~43~~ 23 , and ~~300~~ 305 .~~45~~ 25 . Pressure connectors, and devices for splices and taps shall be listed.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:44:54 EDT 2024

Committee Statement

Committee Statement: With expanded requirements in Articles 110 and 305, references to the "low voltage" requirements were replaced with the equivalent requirements written for installations over 1000 Vac, 1500 Vdc.

Response Message: SR-8188-NFPA 70-2024

[Public Comment No. 82-NFPA 70-2024 \[Section No. 268.46\]](#)



Second Revision No. 8189-NFPA 70-2024 [Section No. 268.50(B)]

(B) All Other Service-Entrance Conductors.

Open wiring on insulators and Type MC cable shall not be installed within 3.0 m (10 ft) of grade level or where exposed to physical damage.

Exception: Type MC cable shall be permitted within 3.0 m (10 ft) of grade level where not exposed to physical damage or where protected in accordance with ~~300~~ 305 .5 15 (D C).

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 16:46:09 EDT 2024

Committee Statement

Committee Statement: With expanded requirements in Article 305, references to the "low voltage" requirements were replaced with the equivalent requirements written for installations over 1000 Vac, 1500 Vdc.

Response Message: SR-8189-NFPA 70-2024

Public Comment No. 83-NFPA 70-2024 [Section No. 268.50(B)]



Second Revision No. 8195-NFPA 70-2024 [Section No. 305.12(A)]

(A) Voltage.

Wiring methods, as specified in Table 305.12(A), shall be permitted as identified in the table.

Table 305.12(A) Wiring Methods Permitted for Use in Systems Rated Over 1000 Volts ac, 1500 Volts dc, Nominal

<u>Wiring Methods Permitted for Use Above 1000 Volts ac, 1500 Volts dc</u>	<u>Voltage Levels</u>	<u>-</u>
Pull and junction boxes, conduit bodies, and handhole enclosures	Over 1000 <u>ac or dc</u>	-
Metal-clad cable (Type MC) <u>when also identified as Type MV</u>	1000–35,000 <u>ac</u>	-
Type MV cable, MV cable joints, MV cable terminations	2001–35,000 ac	-
	-	2001–2500 dc
Type P cable	1000–2000 <u>ac or dc</u>	-
Intermediate metal conduit (IMC)	Over 1000 <u>ac or dc</u>	-
Nonmetallic underground conduit with conductors (NUCC)	Over 1000 <u>ac or dc</u>	-
High-density polyethylene conduit (HDPE)	Over 1000 <u>ac or dc</u>	-
Rigid metal conduit (RMC)	Over 1000 <u>ac or dc</u>	-
Rigid polyvinyl chloride conduit (PVC)	Over 1000 <u>ac or dc</u>	-
Reinforced thermosetting resin conduit (RTRC)	Over 1000 <u>ac or dc</u>	-
Electrical metallic tubing (EMT)	Over 1000 <u>ac or dc</u>	-
Auxiliary gutters	Over 1000 <u>ac or dc</u>	-
Busway	Over 1000 <u>ac or dc</u>	-
	1000–35,000 ac	-
Cablebus	2001–2500 dc	-
Cable trays	1000–35,000 <u>ac or dc</u>	-
Messenger-supported wiring	1000–35,000 <u>ac</u>	-
Outdoor overhead conductors	Over 1000 <u>ac or dc</u>	-
Insulated bus pipe (IBP)	1000–35,000 ac	-
<u>Liquidtight flexible metal conduit (LFMC)</u>	<u>Over 1000 ac or dc</u>	-
<u>Flexible metal conduit (FMC)</u>	<u>Over 1000 ac or dc</u>	-

Exposed runs of Type MV cables, bare conductors, and bare busbars shall be permitted in locations accessible only to qualified persons. Busbars shall be permitted to be either copper or aluminum.

Exception: Airfield lighting cable used in series circuits that are powered by regulators and installed in restricted airport lighting vaults shall be permitted as exposed cable installations.

Informational Note: An example of a common application is FAA L-824 cables installed as exposed runs within a restricted vault area.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_SR8195_305.12_A_.docx		
70_SR8195_305.12_A_CMP-9.docx	For prod use	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 17:37:17 EDT 2024

Committee Statement

Committee Statement: Table 305.12(A) has been updated to reflect the addition of liquidtight flexible metal conduit and flexible metal conduit which are common wiring methods used within this voltage range. The entry for “Type MC cable” was also updated to clarify that “Type MC cable” rated for higher voltages is also identified as “Type MV cable”. And lastly the table is being revised to clarify where there is an upper voltage limit and what that limit is based on whether it is an ac or dc system. Liquidtight flexible nonmetallic conduit was not added to the table as not all LFNC is suitable for use with MV-90 or MV105 conductors. This revision does not remove the allowance in Article 600, where LFNC is permitted.

Response Message: SR-8195-NFPA 70-2024

[Public Comment No. 1729-NFPA 70-2024 \[Section No. 305.12\(A\)\]](#)

[Public Comment No. 1720-NFPA 70-2024 \[Section No. 305.12\(A\)\]](#)



Second Revision No. 8209-NFPA 70-2024 [Section No. 305.16]

305.16 Protection Against Corrosion and Deterioration.

Raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures- ~~(other than surrounding fences and walls)~~, elbows, couplings, fittings, supports, and support hardware shall be of materials suitable for the environment in which they are to be installed. For the purposes of this section, fences and walls surrounding electrical equipment shall not be considered enclosures.

(A) Ferrous Metal Equipment.

Ferrous metal raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures- ~~(other than surrounding fences and walls)~~, elbows, couplings, nipples, fittings, supports, and support hardware shall be suitably protected against corrosion inside and outside ~~(except threads at joints)~~ by a coating of approved corrosion-resistant material. Where corrosion protection is necessary and the conduit is threaded anywhere other than at the factory where the product is listed, the threads shall be coated with an approved electrically conductive, corrosion-resistant compound.

Exception: Stainless steel shall not be required to have protective coatings.

(1) Protected from Corrosion Solely by Enamel.

Where protected from corrosion solely by enamel, ferrous metal raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures- ~~(other than surrounding fences and walls)~~, elbows, couplings, nipples, fittings, supports, and support hardware shall not be used outdoors or in wet locations as described in 305.14(D).

(2) Organic Coatings on Boxes or Cabinets.

Where boxes, cabinets, or enclosures ~~(other than surrounding fences and walls)~~ have enclosures have an approved system of organic coatings and are marked "Raintight," "Rainproof," or "Outdoor Type," they shall be permitted outdoors.

(3) In Concrete or in Direct Contact with the Earth.

Ferrous metal raceways, cable armor, boxes, cable sheathing, cabinets, enclosures- ~~(other than surrounding fences and walls)~~, elbows, couplings, nipples, fittings, supports, and support hardware shall be permitted to be installed in concrete, in direct contact with the earth, or in areas subject to severe corrosive influences where made of material approved for the condition or where provided with corrosion protection approved for the condition.

(B) Aluminum Metal Equipment.

Aluminum raceways, cable trays, cablebus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, enclosures- ~~(other than surrounding fences and walls)~~, elbows, couplings, nipples, fittings, supports, and support hardware embedded or encased in concrete or in direct contact with the earth shall be provided with supplementary corrosion protection.

(C) Nonmetallic Equipment.

Nonmetallic raceways, cable trays, cablebus, auxiliary gutters, boxes, cables with a nonmetallic outer jacket and internal metal armor or jacket, cable sheathing, cabinets, enclosures- ~~(other than surrounding fences and walls)~~, elbows, couplings, nipples, fittings, supports, and support hardware shall be made of material approved for the condition and shall comply with 305.14(C)(1) and 305.14(C)(2) as applicable to the specific installation.

(1) Exposed to Sunlight.

Where exposed to sunlight, the materials shall be listed as sunlight resistant or shall be identified as sunlight resistant.

(2) Chemical Exposure.

Where subject to exposure to chemical solvents, vapors, splashing, or immersion, materials or coatings shall either be inherently resistant to chemicals based on their listing or be identified for the specific chemical reagent.

(D) Indoor Wet Locations.

In portions of dairy processing facilities, laundries, canneries, and other indoor wet locations, and in locations where walls are frequently washed or where there are surfaces of absorbent materials, such as damp paper or wood, the entire wiring system, where installed exposed, including all boxes, cabinets, enclosures- ~~(other than surrounding fences and walls)~~, fittings, raceways, and cable used therewith, shall be mounted so that there is at least a 6 mm (¼ in.) airspace between it and the wall or supporting surface.

Exception: Nonmetallic raceways, boxes, and fittings shall be permitted to be installed without the airspace on a concrete, masonry, tile, or similar surface.

Informational Note: In general, areas where acids and alkali chemicals are handled and stored might present such corrosive conditions, particularly when wet or damp. Severe corrosive conditions might also be present in portions of meatpacking plants, tanneries, glue houses, and some stables; in installations immediately adjacent to a seashore and swimming pool areas; in areas where chemical deicers are used; and in storage cellars or rooms for hides, casings, fertilizer, salt, and bulk chemicals.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 18:03:02 EDT 2024

Committee Statement

Committee Statement: This section was revised to meet the requirements of the NEC Style Manual in 3.5.1.1 regarding the use of parenthetical language. The additional language in the section clarifies that protection against corrosion and deterioration does not apply to the fence or wall surrounding the installation.

Response Message: SR-8209-NFPA 70-2024

[Public Comment No. 384-NFPA 70-2024 \[Section No. 305.16\]](#)

[Public Comment No. 115-NFPA 70-2024 \[Section No. 305.16\]](#)



Second Revision No. 8210-NFPA 70-2024 [Section No. 305.28(B)]

(B) Welding.

Metal raceways shall not be supported, terminated, or connected by welding to the raceway ~~unless specifically designed to be or otherwise specifically permitted to be in this code .~~

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 18:07:41 EDT 2024

Committee Statement

Committee Statement: Welding has the possibility of damaging the interior of the raceway, which could damage the conductors. In addition, welding of raceways is not generally recognized by certifying bodies and could result in changes to the characteristics of the raceway that have not been evaluated.

Response Message: SR-8210-NFPA 70-2024

[Public Comment No. 386-NFPA 70-2024 \[Section No. 305.28\(B\)\]](#)



Second Revision No. 8217-NFPA 70-2024 [Section No. 315.3]

315.3 Reconditioned Equipment.

Reconditioned

(A) Permitted to be Installed. (Reserved)

(B) Not Permitted to be Installed.

The installation of the following reconditioned equipment shall not be permitted:

(1) Type MV cables and conductors

shall not be installed.

(2) Cable joints

(3) Cable terminations

(4) Connectors

(5) Fittings associated with 315.3(B)(1) through 315.3(B)(4).

Informational Note: Rejuvenation is not reconditioning. Rejuvenation is a process that involves injecting a specially formulated fluid into an aged medium voltage power cable, with the cable remaining in place, to extend the useful lifespan and improve performance.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-9_SR-8217_315.3.docx		

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 18:39:47 EDT 2024

Committee Statement

Committee Statement: The restructuring of 315.3 aligns with the recommendations from the Correlating Committee to include reconditioning requirements for MV cable joints and MV cable terminations, connectors and associated fittings. CMP 9 also has added an informational note following 315.3 to provide clarity to the process of cable rejuvenation.

Response Message: SR-8217-NFPA 70-2024

[Public Comment No. 74-NFPA 70-2024 \[Section No. 315.3\]](#)

[Public Comment No. 311-NFPA 70-2024 \[Section No. 315.3\]](#)



Second Revision No. 8257-NFPA 70-2024 [Section No. 315.10(C) [Excluding any Sub-Sections]]

Thickness of insulation for shielded solid dielectric insulated conductors rated 2001 volts to 35,000 volts shall ~~comply with~~ not be less than the requirements of Table 315.10(C) and 315.10(C)(1) through 315.10(C)(3).

Table 315.10(C) Thickness of Insulation for Shielded Solid Dielectric Insulated Conductors Rated 2001 Volts to 35,000 Volts

2001–5000 Volts										5001–8000 Volts									
Conductor		100		133				173				100		133		173			
Size		Percent		Percent		Percent		Percent		Percent		Percent		Percent		Percent			
(AWG		Insulation		Insulation		Insulation		Insulation		Insulation		Insulation		Insulation		Insulation			
Level		Level		Level		Level		Level		Level		Level		Level		Level			
or kcmil)		mm		mils		mm		mils		mm		mils		mm		mils			
8		2.29	90	-	2.92	115	3.56	140	—	—	-	—	—	-	—	—	-		
6–4		2.29	90	-	2.92	115	3.56	140	2.92	115	-	3.56	140	-	4.45	175	-		
2		2.29	90	-	2.92	115	3.56	140	2.92	115	-	3.56	140	-	4.45	175	-		
1		2.29	90	-	2.92	115	3.56	140	2.92	115	-	3.56	140	-	4.45	175	-		
1/0–2000		2.29	90	-	2.92	115	3.56	140	2.92	115	-	3.56	140	-	4.45	175	-		

25,001–28,000 Volts										28,001–35,000 Volts									
Conductor		100		133		173		100		133									
Size		Percent		Percent		Percent		Percent		Percent		Percent		Percent		Percent			
(AWG		Insulation		Insulation		Insulation		Insulation		Insulation		Insulation		Insulation		Insulation			
Level		Level		Level		Level		Level		Level		Level		Level		Level			
or kcmil)		mm		mils		mm		mils		mm		mils		mm		mils			
1		-	7.11	280	-	8.76	345	-	11.30	445	-	—	—	-	—	—	-		
1/0–2000		-	7.11	280	-	8.76	345	-	11.30	445	-	8.76	345	-	10.67	420	-	14	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 14:10:51 EDT 2024

Committee Statement

Committee Statement: This revision clarifies that a cable with a higher level of insulation thickness can be used to meet lower-level requirements.

Response SR-8257-NFPA 70-2024
Message:

[Public Comment No. 187-NFPA 70-2024 \[Section No. 315.10\(C\)\(3\)\]](#)



Second Revision No. 8245-NFPA 70-2024 [Section No. 315.17]

[See attached Word document for 315.17 revisions.]

315.17 Marking for Type MV Cable Joints and Terminations.

(A) Required Information for Type MV Cable Joints, Terminations, and Connectors.

All Type MV cable joints, cable terminations, and connectors shall be marked to indicate the following information, using one or more of the methods described in 315.17(B)(1) or 315.17(B)(2), and shall be permitted to be optionally marked as described in 315.17(C):

- (1) The maximum rated voltage.
- (2) The proper type letter or letters for the type of wire or cable as specified elsewhere in this Code that the cable joint or cable terminations is listed for use with.
- (3) The manufacturer's name, trademark, or other distinctive marking by which the organizations responsible for the product can be readily identified.
- (4) The conductor AWG size or circular mil area size, or range of sizes, that the cable joint or cable terminations is listed for use with.
- (5) The cable outer diameter size, or size range, that the cable joint or cable termination is listed for use with.
- (6) Connectors shall be marked with the following information; the marking shall also be on the unit container (the smallest container in which the connector is packaged):
 - (7) The manufacturer's name, trademark, or other distinctive marking by which the organization responsible for the product can be readily identified
 - (8) The manufacturer's catalog number
 - (9) The conductor AWG size or circular mil use range, and die number if applicable
 - (10) The type of conductor material(s) the connector is for use with

(B) Method of Marking for Type MV Cable Joints, Terminations, and Connectors.

One or both of the methods in 315.17(B)(1) or 315.17(B)(2) shall be used for the marking of cable joints, terminations, or connectors.

(1) Surface Marking.

Type MV cable joints, terminations, or connectors shall be durably marked on the surface.

(2) Tag Marking.

Type MV cable joints, terminations, or connectors shall be marked by means of a durably printed tag or label attached to joint or termination.

(C) Optional Markings.

Type MV cable joints and cable terminations shall be permitted to be marked to indicate special characteristics, such as limited smoke and sunlight resistance.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
SR-8245_on_315.17.docx	SR-8245 on 315.17	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 12:25:18 EDT 2024

Committee Statement

Committee Statement: The revision made to 315.17(A) aligns the requirements with the NEC style manual. In 315.17(A)(1), “or nominal” was added since IEEE 48 and IEEE 404 does not define maximum rated voltages for accessories, but simply the voltage class or nominal operating voltage. Since the optional marking language was deleted from 315.17(A), the title to 315.17(C) has been updated to clearly indicate that 315.17(C) addresses optional markings that can be made, in addition to what is required. The additional proposed revisions have not been adopted since they would not provide added clarity or enhance the existing requirements.

Response Message: SR-8245-NFPA 70-2024

[Public Comment No. 1757-NFPA 70-2024 \[Section No. 315.17\(A\)\]](#)



Second Revision No. 8259-NFPA 70-2024 [New Section after 450.1]

450.2 Listing Requirements. (Reserved)

450.3 Reconditioned Equipment.

(A) Permitted to be Installed. (Reserved)

(B) Not Permitted to be Installed. (Reserved)

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Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 14:24:58 EDT 2024

Committee Statement

Committee Statement: This section has been added to meet the NEC Style Manual. The sections are marked "reserved" as there are no requirements being added for these sections at this time.

Response Message: SR-8259-NFPA 70-2024



Second Revision No. 8231-NFPA 70-2024 [Section No. 450.6]

450.6 Autotransformers 1000 Volts, Nominal, or Less.

(A) Overcurrent Protection.

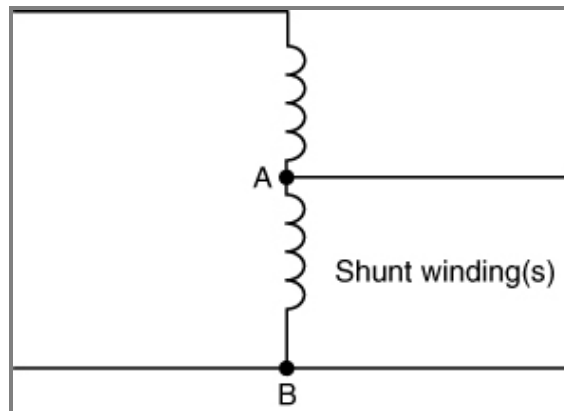
Each autotransformer 1000 volts, nominal, or less shall be protected ~~by an~~ in accordance with all of the following.

- (1) An individual overcurrent device shall be installed in series with each ungrounded input conductor. ~~Such an~~
- (2) The overcurrent device shall be rated or set at not more than 125 percent of the rated full-load input current of the autotransformer.
- (3) ~~Where this calculation~~ the calculation in 450.6(A)(2) does not correspond to a standard rating of a fuse or nonadjustable circuit breaker and the rated input current is 9 amperes or more, the next higher standard rating described in 240.6 shall be permitted.

(B) Shunt Winding.

An overcurrent device shall not be installed in series with the shunt winding- (which is the winding ~~common to both the input and the output circuits~~) of the autotransformer between Point A and Point B as shown in Figure 450.6(A B).

Figure 450 Figure 450 .6(A B) -Autotransformer Autotransformer .



Exception: Where the rated input current of the autotransformer is less than 9 amperes, an overcurrent device rated or set at not more than 167 percent of the input current shall be permitted.

(B C) Transformer Field-Connected as an Autotransformer.

A transformer field-connected as an autotransformer shall be identified for use at elevated voltage.

Informational Note: See 210.9 and 215.11 for information on permitted uses of autotransformers.

Supplemental Information

File Name
NEC_CMP-9_SR-8231_450.6.docx

Description

Approved

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 19:38:46 EDT 2024

Committee Statement

Committee Statement: The requirements were modified to meet the list requirements of the NEC Style Manual section 3.5.1.1. The parenthetical clause was revised to improve clarity.

Response Message: SR-8231-NFPA 70-2024

[Public Comment No. 313-NFPA 70-2024 \[Section No. 450.4\]](#)



Second Revision No. 8232-NFPA 70-2024 [Section No. 450.11]

450.11 Ventilation.

(A) General.

Ventilation shall dispose of the transformer full-load heat losses without creating a temperature rise that is in excess of the transformer rating.

(B) Ventilation Openings.

Transformers with ventilating openings shall be installed so that the ventilating openings are not blocked by walls or other obstructions.

(C) Marking.

The required clearances shall be clearly marked on the transformer. Transformer top surfaces that are horizontal and readily accessible shall be marked to prohibit storage.

Informational Note No. 1: See IEEE C57.12.00-~~2015~~ 2021 , *General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers*, and IEEE C57.12.01-2020, *General Requirements for Dry-Type Distribution and Power Transformers*, for additional information.

Informational Note No. 2: See IEEE C57.110-2018, *Recommended Practice for Establishing Liquid-Filled and Dry-Type Power and Distribution Transformer Capability When Supplying Nonsinusoidal Load Currents*, for more information where transformers are used with nonlinear loads that have nonsinusoidal currents that can result in additional losses and transformer heating.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 19:45:10 EDT 2024

Committee Statement

Committee Statement: The informational note was modified to reference the most recent version of IEEE C57.12.00.

Response Message: SR-8232-NFPA 70-2024

Public Comment No. 314-NFPA 70-2024 [Section No. 450.11]



Second Revision No. 8236-NFPA 70-2024 [Section No. 450.12(A)]

(A) Dry-Type Transformer Enclosures.

Terminal bars shall comply with all of the following:

- (1) Where separate equipment grounding conductors and supply-side bonding jumpers are installed, a terminal bar for all grounding and bonding conductor connections shall be secured inside the transformer enclosure.
- (2) The terminal bar shall be bonded to the enclosure in accordance with 250.12- ~~and shall not be installed on or over any vented portion of the enclosure~~.
- (3) The terminal bars shall be installed where it does not obstruct any ventilation openings.
- (4) Multiple terminal bars shall be permitted if they are interconnected with a bonding jumper of cross-sectional area not less than the largest conductor connected to either interconnected terminal bar.

Exception: Where a dry-type transformer is equipped with wire-type connections (leads), the grounding and bonding connections shall be permitted to be connected together using any of the methods in 250.8 and shall be bonded to the enclosure if of metal.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-9_SR-450.12_A_.docx		

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Mon Oct 21 20:10:17 EDT 2024

Committee Statement

Committee Statement: The original text did not prohibit the use of multiple terminal bars, but it also did not address their use. The text has been revised to allow multiple bars if they are interconnected with a jumper of appropriate cross-sectional area to allow additional grounding and bonding conductor connections. 450.12(A) has also been edited to appear in list form to align with the NEC style manual.

Response Message: SR-8236-NFPA 70-2024

Public Comment No. 97-NFPA 70-2024 [Section No. 450.12(A)]



Second Revision No. 8258-NFPA 70-2024 [Section No. 450.16]

450.16 Disconnecting Means.

Transformers, other than Class 2 or Class 3 transformers, shall have a disconnecting means located either ~~in~~ within sight of the transformer in accordance with 110.39 or in a remote location. Where located in a remote location, the disconnecting means shall be lockable open in accordance with 110.25, and its location shall be field marked on the transformer.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 14:21:17 EDT 2024

Committee Statement

Committee Statement: Wording has been revised to provide a reference to 110.39 to direct the reader to the requirements concerning "within sight". This aligns with the recommendation of PC-327.

Response Message: SR-8258-NFPA 70-2024



Second Revision No. 8266-NFPA 70-2024 [Section No. 495.2]

495.2 Listing Requirements.

(A) Equipment Rated Not Over 15,000 Volts.

Switchgear and industrial control assemblies operating ~~up to~~ not over 15,000 volts ac or dc, nominal, shall be listed. The listing requirement for this equipment shall be effective January 1, 2029.

(B) Equipment Rated Over 15,000 Volts.

Switchgear and industrial control assemblies operating over 15,000 volts ac or dc, nominal, but not over 52,000 volts ac or dc, nominal, shall be listed. This listing requirement shall be effective January 1, 2032.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-9_SR-8266_495.2.docx		

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Tue Oct 22 16:29:01 EDT 2024

Committee Statement

Committee Statement: Added a listing requirement for equipment over 15 kV and not over 52 kV to require the equipment to meet the equipment standard requirements. A future effective date was included for the new listing requirement to allow a reasonable amount of time for manufacturers to meet the requirement. Added section headings to improve readability and meet the NEC Style Manual requirements. The term “up to” was changed to “not over” to provide consistent wording in similar sections.

Response Message: SR-8266-NFPA 70-2024

[Public Comment No. 1021-NFPA 70-2024 \[Section No. 495.2\]](#)

[Public Comment No. 1338-NFPA 70-2024 \[Section No. 495.2\]](#)

[Public Comment No. 315-NFPA 70-2024 \[Section No. 495.2\]](#)

[Public Comment No. 1339-NFPA 70-2024 \[Section No. 495.2\]](#)



Second Revision No. 8337-NFPA 70-2024 [Section No. 495.3]

495.3 Reconditioned Equipment.

(A) Permitted to be Installed.

~~Reconditioned-~~ The installation of reconditioned switchgear, or sections of switchgear, shall be permitted- ~~to be installed~~ .

If equipment has been damaged by fire, products of combustion corrosive influences , or water, it shall be specifically evaluated by its manufacturer or a qualified testing laboratory prior to being returned to service.

(B) Not Permitted to be Installed.

~~Except as modified within this article, reconditioned equipment-~~ The installation of reconditioned equipment other than switchgear, or sections of switchgear, shall not be ~~installed~~ permitted .

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Wed Oct 23 17:13:22 EDT 2024

Committee Statement

Committee Statement: The language has been changed for consistency in accordance with recommendation from the Correlating Committee. The language “corrosive influences” was added to be consistent with the similar requirements in 404.3 and 408.3.

Response Message: SR-8337-NFPA 70-2024

[Public Comment No. 103-NFPA 70-2024 \[Section No. 495.3\]](#)

[Public Comment No. 316-NFPA 70-2024 \[Section No. 495.3\]](#)

[Public Comment No. 555-NFPA 70-2024 \[Section No. 495.3\]](#)

[Public Comment No. 1463-NFPA 70-2024 \[Section No. 495.3\]](#)



Second Revision No. 8272-NFPA 70-2024 [Section No. 495.25]

495.25 Backfeed.

Installations where the possibility of backfeed exists shall comply with 495.25(A) and 495.25(B).

(A) Sign.

A permanent sign in accordance with 110.21(B) shall be installed on the disconnecting means enclosure or immediately adjacent to open disconnecting means with the following words or equivalent:

DANGER — CONTACTS ON EITHER SIDE OF THIS DEVICE MAY BE ENERGIZED BY BACKFEED.

(B) Diagram.

A permanent and legible single-line diagram of the local switching arrangement, clearly identifying each point of connection to the high-voltage section, shall be provided within sight of each point of connection in accordance with 110.39.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 16:55:22 EDT 2024

Committee Statement

Committee Statement: Wording was revised to provide a reference to 110.39 to direct the reader to the requirements concerning “within sight”. This revision address the concerns raised by PC-327.

Response Message: SR-8272-NFPA 70-2024



Second Revision No. 8273-NFPA 70-2024 [Section No. 495.26]

495.26 Grounding Switches.

Where grounding switches are installed, they shall comply with 495.26(A) and 495.26(B).

(A) Interlocking.

Grounding switches shall be interlocked with the disconnecting means for all sources of power to the location where the ~~ground~~-grounding switch is applied, so that the disconnecting means must be open prior to moving the grounding switch to the grounded position and the disconnecting means cannot be closed while the grounding switch is in the grounded position.

Exception: Interlocking shall not be required for installations under single management where documented safe switching procedures are established and maintained.

(B) Sign.

A sign in accordance with 110.21(B) shall be installed at the grounding switch location indicating that a grounding switch is present and the designation and locations of all disconnecting means which must be opened prior to moving the grounding switch to the grounded position. This sign shall be permitted to be field- or factory-installed.

Exception: A sign shall not be required when a grounding switch is interlocked with a disconnecting means in accordance with 495.26(A), and there is no other source of power to the grounding switch location.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 16:56:50 EDT 2024

Committee Statement

Committee Statement: The term “ground switch” is changed to “grounding switch” to have the correct reference to the equipment.

Response Message: SR-8273-NFPA 70-2024

[Public Comment No. 778-NFPA 70-2024 \[Section No. 495.26\(A\)\]](#)

[Public Comment No. 317-NFPA 70-2024 \[Section No. 495.26\]](#)



Second Revision No. 8338-NFPA 70-2024 [Section No. 495.30]

495.30 General.

~~Article 495, Part III, covers~~ The requirements of this part shall apply to substations, assemblies of switchgear and industrial control equipment, including, but not limited to, ~~switches~~ the following:

- (1) Switches and interrupting devices and their control, metering, protection, and regulating equipment controls
- (2) Metering equipment
- (3) Protection Equipment
- (4) Regulating equipment where they are an integral part of the assembly, ~~with associated~~
- (5) Associated interconnections and supporting structures-

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-9_SR-8338_495.30.docx		

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Wed Oct 23 17:18:44 EDT 2024

Committee Statement

Committee Statement: Modified the section to create a parallel structure for the first section in each part of the Article as required per the NEC Style Manual. The term "substations" was added to the charging language as "substations" are under the scope of Part III.

Response Message: SR-8338-NFPA 70-2024

Public Comment No. 772-NFPA 70-2024 [Section No. 495.30]



Second Revision No. 8274-NFPA 70-2024 [Section No. 495.36]

495.36 Switchgear Enclosure and Mounting Installation .

Switchgear shall consist of a ~~substantial~~ metal structure and a sheet metal enclosure. Where installed over a combustible floor, ~~suitable~~ non-combustible protection ~~thereto~~ shall be ~~provided~~ provided under any openings in the bottom of the switchgear .

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NEC_CMP-9_SR-8274_495.36.docx		

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 17:01:42 EDT 2024

Committee Statement

Committee Statement: The ambiguous terms “substantial” and “suitable” were replaced with enforceable requirements. The section title was revised for better coordination with the requirements in the section.

Response Message: SR-8274-NFPA 70-2024

Public Comment No. 318-NFPA 70-2024 [Section No. 495.36]



Second Revision No. 8276-NFPA 70-2024 [Section No. 495.40]

495.40 Visual Inspection Windows.

Windows intended for visual inspection of disconnecting switches or other devices shall be of ~~suitable transparent material~~ of transparent material which is impact and flame resistant .

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 17:06:26 EDT 2024

Committee Statement

Committee Statement: The ambiguous term “suitable” was replaced with enforceable requirements. The terms of “impact” and “flame resistant” better align with the terms used in product standards.

Response Message: SR-8276-NFPA 70-2024



Second Revision No. 8343-NFPA 70-2024 [Section No. 495.61]

[See attached Word document for 495. 61 revisions.]

495 . 61 _ General.

(A) Covered.

The requirements of this part shall apply to installations and use of high-voltage power distribution and utilization equipment that is portable, mobile, or both, and include but not be limited to the following:

- (1) Substations and switch houses mounted on skids
- (2) Trailers or cars
- (3) Mobile shovels
- (4) Draglines
- (5) Cranes
- (6) Hoists
- (7) Drills
- (8) Dredges
- (9) Compressors
- (10) Pumps
- (11) Conveyors
- (12) Underground excavators

(B) Grounding and Bonding.

Grounding and bonding shall comply with Article 250, Part X.

(C) Protection.

Approved enclosures or guarding, or both, shall be provided to protect portable and mobile equipment from physical damage.

(D) Disconnecting Means.

Disconnecting means shall be installed for mobile and portable high-voltage equipment according to the requirements of Article 230, Part VIII, and shall disconnect all ungrounded conductors.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
70_CMP9_SR8343_495.61.docx		
NEC_CMP-9_SR-8343_495.61.docx	For prod use	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Wed Oct 23 17:49:43 EDT 2024

Committee Statement

Committee Statement: General section 495.60 was added with content from 495.61(A) to meet the requirements of the NEC Style Manual. Items 495.61(B) and (C) were removed as they are covered in other articles. The reference to Article 230, Part VIII has been updated to the correct reference, Article 268, Part VI.

Response Message: SR-8343-NFPA 70-2024

[Public Comment No. 319-NFPA 70-2024 \[Section No. 495.61\]](#)

[Public Comment No. 780-NFPA 70-2024 \[New Part after IV.\]](#)

[Public Comment No. 782-NFPA 70-2024 \[Section No. 495.61\]](#)



Second Revision No. 8263-NFPA 70-2024 [Section No. 495.62]

495.62 Overcurrent Protection.

Motors driving single or multiple dc generators supplying a system operating on a cyclic load basis shall not require overload protection if the thermal rating of the ac drive motor cannot be exceeded under any operating condition. The branch-circuit ~~protective device(s)~~ OCPDs shall provide short-circuit and locked-rotor protection and shall be permitted to be external to the equipment.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 14:54:39 EDT 2024

Committee Statement

Committee Statement: All instances of the term “overcurrent”, “overcurrent protective devices” and “overcurrent protection” were reviewed and changes were made to align proposed and currently defined terms. This action is related to the proposed revisions in PC-1649.

Response Message: SR-8263-NFPA 70-2024



Second Revision No. 8280-NFPA 70-2024 [Section No. 495.66]

495.66 High-Voltage Portable Cable for Main Power Supply.

Flexible high-voltage cable supplying power to portable or mobile equipment shall comply with the grounding and bonding requirements in Article ~~250~~ 270 , Parts V, and VI, and ~~X~~, and the flexible cable requirements in Article 400, Parts III and IV.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 17:35:02 EDT 2024

Committee Statement

Committee Statement: References to Article 250 have been updated to reflect the introduction of new Article 270.

Response Message: SR-8280-NFPA 70-2024

[Public Comment No. 320-NFPA 70-2024 \[Section No. 495.66\]](#)

[Public Comment No. 785-NFPA 70-2024 \[Section No. 495.66\]](#)



Second Revision No. 8281-NFPA 70-2024 [Section No. 495.70]

495.70 General.

The provisions of Article 495, Part V, shall requirements of this part shall apply to boilers operating over 1000 volts ac, 1500 volts dc, nominal, in which heat is generated by the passage of current between electrodes through the liquid being heated.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 17:38:07 EDT 2024

Committee Statement

Committee Statement: Modified the section to create a parallel structure for the first section in each part of the Article as required per the NEC Style Manual. Voltage levels have been removed as this is a Part in Article 495 and there is no need to restate the voltage limitations in this Section.

Response Message: SR-8281-NFPA 70-2024

[Public Comment No. 784-NFPA 70-2024 \[Section No. 495.70\]](#)



Second Revision No. 8301-NFPA 70-2024 [New Section after 495.74]

Part VI. Equipment with Insulating Liquids

495.80 General.

This part shall cover installation requirements for equipment, other than transformers, that contain more than 10 gallons of insulating fluid in a single volume within the equipment.

Informational Note: See Part II of Article 450 for installation requirements for insulating fluid filled transformers and their associated internal equipment.

495.81 Equipment Containing Less-Flammable Liquid.

Equipment containing listed less-flammable liquids that have a fire point of not less than 300°C shall be permitted to be installed in accordance with 495.81(A) or 495.81(B).

(A) Indoor Installations.

Indoor installations shall be permitted in accordance with one of the following:

(1) In Type I or Type II buildings, in areas where all of the following requirements are met:

- a. The equipment is rated 35,000 volts or less.
- b. No combustible materials are stored.
- c. A liquid confinement area with enough capacity to contain the volume of oil contained in the equipment is provided.
- d. The installation complies with all the restrictions provided for in the listing of the liquid.

Informational Note No. 1: See NFPA 220-2021, *Standard on Types of Building Construction*, for definitions of Type I and Type II building construction.

Informational Note No. 2: Such restrictions in 495.81(1)(d) include, but are not limited to, maximum pressure of the tank, use of a pressure relief valve, appropriate fuse types, and proper sizing of overcurrent protection.

(2) Where an automatic fire extinguishing system in the immediate area of the equipment and a liquid confinement area with enough capacity to contain the largest volume of oil contained in a single tank within the equipment is present, provided the equipment is rated 35,000 volts or less.

(3) If the installation complies with 495.83.

(B) Outdoor Installations.

Less-flammable liquid-filled equipment shall be permitted to be installed outdoors, attached to, adjacent to, or on the roof of buildings, if installed in accordance with either of the following:

- (1) For Type I and Type II buildings, the installation of the equipment and construction of the building shall comply with all the restrictions provided for in the listing of the liquid.**

Informational Note No. 1: See NFPA 220-2021, *Standard on Types of Building Construction*, for definitions of Type I and Type II building construction.

Informational Note No. 2: Such restrictions include, but are not limited to, maximum pressure of the tank, use of a pressure relief valve, appropriate fuse types, and proper sizing of overcurrent protection.

- (2) The installation of the equipment and construction of the building shall be in accordance with 495.84.**

Informational Note No. 3: See 495.84 for examples of additional safeguards that can be required for installations adjacent to combustible material, fire escapes, or door and window openings.

495.82 Equipment Containing Nonflammable Fluid.

(A) Installed Indoors or Outdoors.

Equipment containing a dielectric fluid identified as nonflammable shall be permitted to be installed indoors or outdoors. Equipment installed indoors shall be installed in accordance with the following.

- (1) Equipment rated over 35,000 volts shall be installed in a vault meeting the requirements of Part VII of Article 495.**
- (2) Equipment shall be furnished with a pressure-relief vent and a liquid confinement area with enough capacity to contain the volume of oil within the equipment .**
- (3) Equipment shall be furnished with a means for absorbing any gases generated by arcing inside the tank, or be furnished with a pressure-relief vent connected to a chimney or flue that will carry such gases to an environmentally safe area.**

(B) Nonflammable Dielectric Fluid.

For the purposes of this section, a nonflammable dielectric fluid shall be one that does not have a flash point or fire point and is not flammable in air.

495.83 Equipment Containing Oil Installed Indoors.

(A) Applicability.

These requirements shall apply to equipment that use insulating liquids other than less-flammable, nonflammable, or askarel insulated liquids.

(B) Vault.

Oil-insulated equipment installed indoors shall be installed in a vault constructed as specified in Part VII of this article.

Exception: Equipment shall be permitted to be installed in a detached building that does not comply with Part VI of this article if neither the building nor its contents present a fire hazard to any other building or

property, and if the building is used only in supplying electric service and the interior is accessible only to qualified persons.

495.84 Equipment Containing Oil Installed Outdoors.

These requirements shall apply to equipment that use insulating liquids other than less-flammable, nonflammable, or askarel insulated liquids.

(A) Combustible Material.

Combustible material, combustible buildings, and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires and oil spills originating in equipment installed on roofs, attached to or adjacent to a building or combustible material.

(B) Safeguarding.

In cases where the equipment installation presents a fire hazard, one or more of the following safeguards shall be applied according to the degree of hazard involved:

- (1) Space separations
- (2) Fire-resistant barriers
- (3) Automatic fire suppression systems
- (4) Enclosures that confine the oil of a ruptured equipment tank

(C) Oil Enclosures.

(1) Confinement.

Oil enclosures shall be permitted to consist of fire-resistant dikes, curbed areas or basins, or trenches filled with coarse, crushed stone.

(2) Drains.

Oil enclosures shall be provided with trapped drains where the exposure and the quantity of oil involved are such that removal of oil is important.

Informational Note: See ANSI/IEEE C2-2023, National Electrical Safety Code, for additional information on oil-filled equipment installed on poles or structures or underground.

495.85 Modification of Equipment.

When modifications are made to equipment in an existing installation that change the type of the insulating liquid in the equipment, such equipment shall be marked to show the new type of insulating liquid installed, and the modified equipment installation shall comply with the requirements for that type of insulating liquid.

Part VII. Equipment Vaults

495.90 General.

This article shall cover requirements for vaults for equipment, other than transformers, that contain more than 10 gallons of insulating fluid in a single volume within the equipment.

Informational Note: See Part III of Article 450 for vault requirements for transformers and associated internal equipment with insulating fluid.

495.91 Location.

Vaults shall be located where they can be ventilated to the outside air without using flues or ducts wherever such an arrangement is practicable.

495.92 Walls, Roofs, and Floors.

The walls and roofs of vaults shall be constructed of materials that have approved structural strength for the conditions with a minimum fire resistance of 3 hours.

Exception: Where equipment is protected with automatic sprinkler, water spray, carbon dioxide, or halon, construction of 1-hour rating shall be permitted.

(A) Floors.

The floors of vaults in contact with the earth shall be of concrete that is not less than 100 mm (4 in.) thick, but, where the vault is constructed with a vacant space or other stories below it, the floor shall have approved structural strength for the load imposed thereon and a minimum fire resistance of 3 hours.

(B) Stud and Wallboard Construction.

Stud and wallboard construction shall not be permitted.

Informational Note No. 1: See ASTM E119-20, *Standard Test Methods for Fire Tests of Building Construction and Materials*, for additional information.

Informational Note No. 2: A typical 3-hour construction is 150 mm (6 in.) thick reinforced concrete.

495.93 Doorways.

Vault doorways shall be protected in accordance with 495.93(A), 495.93(B), and 495.93(C).

(A) Type of Door.

(1) Interior Doorways.

Each doorway leading into a vault from the building interior shall be provided with a tight-fitting door that has a minimum fire rating of 3 hours.

Exception: Where equipment is protected with automatic sprinkler, water spray, carbon dioxide, or halon, construction of 1-hour rating shall be permitted.

(2) Exterior Doorways.

The authority having jurisdiction shall be permitted to require such a door for an opening in a vault wall that is on the exterior of the building.

Informational Note: See NFPA 80-2019, *Standard for Fire Doors and Other Opening Protectives*, for additional information.

(B) Sills.

A door sill or curb that is of a height that will confine the oil from the largest equipment insulating liquid volume within the vault shall be provided, and in no case shall the height be less than 100 mm (4 in.).

(C) Accessibility.

(1) Locks.

Doors shall be equipped with locks, and doors shall be kept locked, with access being allowed only to qualified persons.

(2) Egress.

Personnel doors shall be capable of opening not less than 90 degrees in the direction of egress and be equipped with listed fire exit hardware.

495.94 Ventilation Openings.

When ventilation openings are required to prevent a vault temperature rise that is in excess of the equipment rating, openings for ventilation shall be provided in accordance with 495.94(A) through 495.94(F).

Informational Note No.1: Vaults with halon systems can have additional requirements concerning ventilation system operation and openings.

Informational Note No. 2: See NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*, for additional information on halon systems.

(A) Location.

Ventilation openings shall be located as far as possible from doors, windows, fire escapes, and combustible material.

(B) Arrangement.

(1) Ventilation.

A vault ventilated by natural circulation of air shall be permitted to have roughly half of the total area of openings required for ventilation in one or more openings near the floor and the remainder in one or more openings in the roof or in the sidewalls near the roof, or all of the area required for ventilation shall be permitted in one or more openings in or near the roof.

(2) Openings.

Openings near the floor in the containment area shall be installed above the height of the containment wall.

(C) Size.

The minimum size of a vault and any ventilation openings shall be determined based on recommendations from the equipment manufacturer.

(D) Covering.

Ventilation openings shall be covered with durable gratings, screens, or louvers to avoid unsafe conditions.

(E) Dampers.

All ventilation openings to the indoors shall be provided with automatic closing fire dampers that operate in response to a vault fire. Such dampers shall possess a standard fire rating of not less than 1 1 / 2 hours.

Informational Note: See ANSI/UL 555-2020, *Standard for Fire Dampers* , for additional information on fire dampers.

(F) Ducts.

Ventilating ducts shall be constructed of fire-resistant material.

495.95 Drainage.

(A) Drain Construction.

Vaults shall be provided with a drain or other means that will carry off any accumulation of oil or water in the vault unless local conditions make this impracticable.

(B) Floor.

The floor shall be pitched to the drain where provided.

495.96 Water Pipes and Accessories.

(A) Foreign Systems.

Any pipe or duct system foreign to the electrical installation shall not enter or pass through an equipment vault.

(B) Associated Systems.

Piping or other facilities provided for vault fire protection, or for equipment cooling, shall not be considered foreign to the electrical installation.

495.97 Storage in Vaults.

Combustible materials shall not be stored in equipment vaults.

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
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Submitter Information Verification

Committee: NEC-P09

Submittal Date: Tue Oct 22 19:20:30 EDT 2024

Committee Statement

Committee Statement: There was a reference in Article 495 to Article 450 for requirements for liquid filled equipment, but that reference was removed in the first draft as that reference was not effective since Article 450 was about transformers. The reference to Article 450 was removed and a new Article 495 Part VI and VII was added to include requirements for liquid filled equipment other than transformers. Exception 495.92 was located to the appropriate text, due to revisions related to aligning the text to the NEC Style Manual. The location of exception 495.92 clarifies that the exception does not apply to stud and wallboard construction. Exception 495.93 was located to the appropriate text, due to

revisions related to aligning the text to the NEC Style Manual. The location of exception 495.93 clarifies that the exception applies to the 3-hour rating for interior doorways only.

Response SR-8301-NFPA 70-2024
Message:

Public Comment No. 1756-NFPA 70-2024 [New Section after 495.74]



Second Revision No. 8271-NFPA 70-2024 [New Part after II.]

495.20 General.

The requirements of this part are specific provisions that shall apply to all equipment.

Submitter Information Verification

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Committee Statement

Committee Statement: General section was added to meet the requirements of the NEC Style Manual.

Response Message: SR-8271-NFPA 70-2024

Public Comment No. 771-NFPA 70-2024 [New Part after II.]