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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®

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Committee Activity: Comment Stage

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

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

Second Revision No. 8227-NFPA 70-2018 [Detail]

[New definition in Article 100]

Reconditioned.

Electromechanical systems, equipment, apparatus or components that are restored to operating conditions. This process differs from normal servicing of equipment that remains within a facility, or replacement of listed equipment on a one-to-one basis. (CMP-9)

Informational Note: The term “reconditioned” is frequently referred to as “rebuilt,” “refurbished,” or “remanufactured.”

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 19:04:02 EDT 2018

Committee Statement

Committee Statement: This definition is taken from the NEMA document that undergirds Comment 987, but which, as written, is unacceptable because it contains requirements. This wording retains the essential elements from the NEMA definition without including requirements that may need to be developed in future Code editions. The wording also clearly distinguishes both routine maintenance and also one-for-one part replacements from reconditioning. For additional clarity the recommendation also incorporates an adaptation of the informational note that CMP 1 is adding to 110.21(B)(2) relative to other terminology that is often used interchangeably.

Acknowledging that multiple definitions for reconditioned equipment may be processed as second draft revisions CMP 9 recognizes that the definition it has chosen is necessary for the proper application of the requirements added to Articles 408 and 490.

Response Message: SR-8227-NFPA 70-2018

Second Revision No. 8157-NFPA 70-2018 [Section No. 312.5(C)]

(C) Cables.

Where cable is used, each cable shall be secured to the cabinet, cutout box, or meter socket enclosure.

Exception No. 1: Cables with entirely nonmetallic sheaths shall be permitted to enter the top of a surface-mounted enclosure through one or more nonflexible raceways not less than 450 mm (18 in.) and not more than 3.0 m (10 ft) in length, provided all of the following conditions are met:

(1) Each cable is fastened within 300 mm (12 in.), measured along the sheath, of the outer end of the raceway.

(2) The raceway extends directly above the enclosure and does not penetrate a structural ceiling.

(3) A fitting is provided on each end of the raceway to protect the cable(s) from abrasion and the fittings remain accessible after installation.

(4) The raceway is sealed or plugged at the outer end using approved means so as to prevent access to the enclosure through the raceway.

(5) The cable sheath is continuous through the raceway and extends into the enclosure beyond the fitting not less than 6 mm (¼ in.).

(6) The raceway is fastened at its outer end and at other points in accordance with the applicable article.

(7) Where installed as conduit or tubing, the cable fill does not exceed the amount that would be permitted for complete conduit or tubing systems by Table 1 of Chapter 9 of this Code and all applicable notes thereto. Note 2 to the tables in Chapter 9 does not apply to this condition.

Informational Note: See Table 1 in Chapter 9, including Note 9, for allowable cable fill in circular raceways. See 310.15(C)(a 1) for required ampacity reductions for multiple cables installed in a common raceway.

Exception No. 2: Single conductors and multi-conductor cables shall be permitted to enter enclosures in accordance with 392.46(A) or (B).

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 11:20:30 EDT 2018

Committee Statement

Committee Statement: This section is revised based on the rewrite of Article 310 during the first draft stage. Section 310.15(C)(1) would be the correct reference for the informational note.

Response Message: SR-8157-NFPA 70-2018

Public Comment No. 938-NFPA 70-2018 [Section No. 312.5(C)]

Second Revision No. 8158-NFPA 70-2018 [Section No. 312.6(A)]

(A) Width of Wiring Gutters.

Conductors shall not be deflected within a cabinet or cutout box unless a gutter having a width in accordance with Table 312.6(A) is provided. Conductors in parallel in accordance with 310.10(G) shall be judged on the basis of the number of conductors in parallel.

Table 312.6(A) Minimum Wire-Bending Space at Terminals and Minimum Width of Wiring Gutters

Wire Size (AWG or kcmil)		Wires per Terminal									
		1		2		3		4		5	
All Other Conductors	Compact Stranded AA-8000 Aluminum Alloy Conductors (see Note 2)	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
14–10	12–8	Not specified		—	—	—	—	—	—	—	—
8–6	6–4	38.1	1½	—	—	—	—	—	—	—	—
4–3	2–1	50.8	2	—	—	—	—	—	—	—	—
2	1/0	63.5	2½	—	—	—	—	—	—	—	—
1	2/0	76.2	3	—	—	—	—	—	—	—	—
1/0–2/0	3/0–4/0	88.9	3½	127	5	178	7	—	—	—	—
3/0–4/0	250–300	102	4	152	6	203	8	—	—	—	—
250	350	114	4½	152	6	203	8	254	10	—	—
300–350	400–500	127	5	203	8	254	10	305	12	—	—
400–500	600–750	152	6	203	8	254	10	305	12	356	14
600–700	800–1000	203	8	254	10	305	12	356	14	406	16
750–900	—	203	8	305	12	356	14	406	16	457	18
1000–1250	—	254	10	—	—	—	—	—	—	—	—
1500–2000	—	305	12	—	—	—	—	—	—	—	—

Notes:

1. Bending space at terminals shall be measured in a straight line from the end of the lug or wire connector (in the direction that the wire leaves the terminal) to the wall, barrier, or obstruction.

2. This column shall be permitted to be used to determine the minimum wire-bending space for compact stranded aluminum conductors in sizes up to 1000 kcmil and manufactured using AA-8000 series electrical grade aluminum alloy conductor material in accordance with 310.~~106~~ 3 (B). The minimum width of the wire gutter space shall be determined using the all other conductors value in this table.

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 11:23:37 EDT 2018

Committee Statement

Committee Statement: This section is revised based on the rewrite of Article 310 during the PI stage. Section 310.3(B) would be the correct reference in Informational Note No. 2.

Response Message: SR-8158-NFPA 70-2018

Public Comment No. 939-NFPA 70-2018 [Section No. 312.6(A)]

Second Revision No. 8160-NFPA 70-2018 [Section No. 312.6(B)(2)]

(2) Conductors Entering or Leaving Opposite Wall.

Table 312.6(B) shall apply where the conductor does enter or leave the enclosure through the wall opposite its terminal.

Exception No. 1: Where the distance between the wall and its terminal is in accordance with Table 312.6(A), a conductor shall be permitted to enter or leave an enclosure through the wall opposite its terminal, provided the conductor enters or leaves the enclosure where the gutter joins an adjacent gutter that has a width that conforms to Table 312.6(B) for the conductor.

Exception No. 2: A conductor not larger than 350 kcmil shall be permitted to enter or leave an enclosure containing only a meter socket(s) through the wall opposite its terminal, provided the distance between the terminal and the opposite wall is not less than that specified in Table 312.6(A) and the terminal is a lay-in type or removable lug with integral mounting tang, where the terminal is either of the following:

(1) Directed toward the opening in the enclosure and within a 45-degree angle of directly facing the enclosure wall

(2) Directly facing the enclosure wall and offset not greater than 50 percent of the bending space specified in Table 312.6(A)

Informational Note: *Offset* is the distance measured along the enclosure wall from the axis of the centerline of the terminal to a line passing through the center of the opening in the enclosure.

Table 312.6(B) Minimum Wire-Bending Space at Terminals

Wire Size (AWG or kcmil)		Wires per Terminal							
		1		2		3		4 or More	
All Other Conductors	Compact Stranded AA-8000 Aluminum Alloy Conductors (See Note 3.)	mm	in.	mm	in.	mm	in.	mm	in.
14–10	12–8	Not specified		—	—	—	-		— —
8	6	38.1	1½	—	—	—	-		— —
6	4	50.8	2	—	—	—	-		— —
4	2	76.2	3	—	—	—	-		— —
3	1	76.2	3	—	—	—	-		— —
2	1/0	88.9	3½	—	—	—	-		— —
1	2/0	114	4½	—	—	—	-		— —
1/0	3/0	140	5½	140	5½	178	7	—	—
2/0	4/0	152	6	152	6	190	7½	—	—
3/0	250	165[a]	6½[a]	165[a]	6½[a]	203	8	—	—
4/0	300	178[b]	7[b]	190[c]	7½[c]	216[a]	8½[a]	—	—
250	350	216[d]	8½[d]	216[d]	8½[d]	229[b]	9[b]	254	10
300	400	254[e]	10[e]	254[d]	10[d]	279[b]	11[b]	305	12
350	500	305[e]	12[e]	305[e]	12[e]	330[e]	13[e]	356[d]	14[d]
400	600	330[e]	13[e]	330[e]	13[e]	356[e]	14[e]	381[e]	15[e]
500	700–750	356[e]	14[e]	356[e]	14[e]	381[e]	15[e]	406[e]	16[e]
600	800–900	381[e]	15[e]	406[e]	16[e]	457[e]	18[e]	483[e]	19[e]
700	1000	406[e]	16[e]	457[e]	18[e]	508[e]	20[e]	559[e]	22[e]
750	—	432[e]	17[e]	483[e]	19[e]	559[e]	22[e]	610[e]	24[e]
800	—	457	18	508	20	559	22	610	24
900	—	483	19	559	22	610	24	610	24
1000	—	508	20	—	—	—	-		— -
1250	—	559	22	—	—	—	-		— -
1500	—	610	24	—	—	—	-		— -
1750	—	610	24	—	—	—	-		— -

Wire Size (AWG or kcmil)		Wires per Terminal							
		1		2		3		4 or More	
All Other Conductors	Compact Stranded AA-8000 Aluminum Alloy Conductors (See Note 3.)	mm	in.	mm	in.	mm	in.	mm	in.
2000	—	610	24	—	—	—	-	—	-

Notes: 1. Bending space at terminals shall be measured in a straight line from the end of the lug or wire connector in a direction perpendicular to the enclosure wall.

2. For removable and lay-in wire terminals intended for only one wire, bending space shall be permitted to be reduced by the following number of millimeters (inches):

[a] 12.7 mm (½ in.)

[b] 25.4 mm (1 in.)

[c] 38.1 mm (1½ in.)

[d] 50.8 mm (2 in.)

[e] 76.2 mm (3 in.)

3. This column shall be permitted to determine the required wire-bending space for compact stranded aluminum conductors in sizes up to 1000 kcmil and manufactured using AA-8000 series electrical grade aluminum alloy conductor material in accordance with 310.~~106~~ 3 (B).

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 11:25:51 EDT 2018

Committee Statement

Committee Statement: This section is revised based on the rewrite of Article 310 during the first draft stage. Section 310.3(B) would be the correct reference Informational Note No. 3.

Response Message: SR-8160-NFPA 70-2018

Public Comment No. 944-NFPA 70-2018 [Section No. 312.6(B)(2)]

Second Revision No. 8161-NFPA 70-2018 [Section No. 312.8(B)]

(B) Power Monitoring or Energy Management Equipment.

The wiring space of enclosures for switches or overcurrent devices shall be permitted to contain power monitoring or energy management equipment

~~where all of the following conditions are met:~~
in accordance with 312.8(B)(1) through (B)(3).

(1) Identification

The power monitoring or energy management equipment

~~is~~
shall be identified as a field installable accessory as part of the listed equipment or is a listed kit evaluated for field installation in switch or overcurrent device enclosures.

(2) Area

The total area of all conductors, splices, taps, and equipment at any cross section of the wiring space

~~does~~
shal not exceed 75 percent of the cross-sectional area of that space.

(3) Conductors

Conductors used exclusively for control or instrumentation circuits shall comply with either 312.8(B)(3)(a) or (B)(3)(b).

(a) Conductors shall comply with 725.49.

(b) Conductors smaller than 18 AWG, but not smaller than 22 AWG for a single conductor and 26 AWG for a multi-conductor cable, shall be permitted to be used where the conductors and cable assemblies meet all of the following conditions:

(1) Are enclosed within raceways or routed along one or more walls of the enclosure and secured at intervals that do not exceed 250 mm (10 in.).

(2) Are secured within 250 mm (10 in.) of terminations.

(3) Are secured to prevent contact with current carrying components within the enclosure.

(4) Are rated for the system voltage and not less than 600 volts.

(5) Have a minimum insulation temperature rating of 90°C.

(1)

Supplemental Information

File Name	Description	Approved
70_SR8161_312.8_B_.docx	FOR STAFF USE	

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 11:27:45 EDT 2018

Committee Statement

Committee Statement: Sensors associated with power monitoring and energy management equipment operate at very low current levels. These current levels and their corresponding temperatures are subject to limitations established in the end-product Standards, permitting smaller conductors to conduct the energy associated with these circuits.

Use of smaller conductors within the wiring space of power distribution equipment introduces another concern with the mechanical strength of the wire and its ability to withstand the wiring space environment (RE: CMP 9's Committee Statements for PI 3989 and PI 4109). This second draft revision will provide two options for conductors used for the control and instrumentation circuits of power monitoring and energy management equipment. The first option references Section 725.49. This reference covers the existing provision with respect to circuits of these types – without limitations in the wiring space. The second option establishes use of smaller AWG conductors, along with specific construction and installation requirements to address the suitability of these smaller conductors in the wiring space environment.

Response Message: SR-8161-NFPA 70-2018

Public Comment No. 1799-NFPA 70-2018 [Section No. 312.8(B)]

Public Comment No. 56-NFPA 70-2018 [Section No. 312.8(B)]

Second Revision No. 8163-NFPA 70-2018 [Section No. 314.27(C)]

(C) Boxes at Ceiling-Suspended (Paddle) Fan Outlets.

Outlet boxes or outlet box systems used as the sole support of a ceiling-suspended (paddle) fan shall be listed, shall be marked by their manufacturer as suitable for this purpose, and shall not support ceiling-suspended (paddle) fans that weigh more than 32 kg (70 lb). For outlet boxes or outlet box systems designed to support ceiling-suspended (paddle) fans that weigh more than 16 kg (35 lb), the required marking shall include the maximum weight to be supported.

Outlet boxes mounted in the ceilings of habitable rooms of dwelling occupancies in a location acceptable for the ~~future~~ installation of a ceiling-suspended (paddle) fan shall ~~be listed~~ comply with one of the following:

(1) Listed for the sole support of ceiling-suspended (paddle) fans.

(2) An outlet box complying with the applicable requirements of 314.27 and providing access to structural framing capable of supporting of a ceiling-suspended (paddle) fan bracket or equivalent.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 11:54:29 EDT 2018

Committee Statement

Committee Statement: The first revision was further refined to ensure the longstanding and safe practice of supporting a ceiling-suspended (paddle) fan by the structural framing, and independent of the outlet box, remains a viable option.

Response Message: SR-8163-NFPA 70-2018

Public Comment No. 1992-NFPA 70-2018 [Section No. 314.27(C)]

Second Revision No. 8236-NFPA 70-2018 [Section No. 314.29]

314.29 Boxes, Conduit Bodies, and Handhole Enclosures to Be Accessible.

Boxes, conduit bodies, and handhole enclosures shall be installed so that wiring contained in them can be rendered accessible in accordance with 314.29(A)~~,~~ and (B)~~, and (C)~~ .

(A) In Buildings and Other Structures.

Boxes and conduit bodies shall be installed so the contained wiring can be accessed without removing any part of the building or structure.

(B) Underground.

Underground boxes and handhole enclosures shall be installed so they are accessible without excavating sidewalks, paving, earth, or other substance that is to be used to establish the finished grade.

Exception: Listed boxes and handhole enclosures shall be permitted where covered by gravel, light aggregate, or noncohesive granulated soil if their location is effectively identified and accessible for excavation.

~~**(C)** Behind Luminaires.~~

~~Boxes and conduit bodies installed behind a wall or ceiling, other than suspended ceilings, that are not associated with a luminaire shall be installed so the contained wiring can be accessed without the removal of a luminaire or a portion thereof.~~

~~*Exception: Boxes or conduit bodies not associated with a luminaire shall be permitted to be located where access is achieved by the removal of a luminaire or portion thereof. The location of the box or conduit body shall be effectively identified and the luminaire shall be capable of removal without damage to the building structure or finish. The box or conduit body shall be accessible and located within 150 mm (6 in.) of the opening.*~~

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 19:46:13 EDT 2018

Committee Statement

Committee Statement: As noted in the Correlating Committee Note No. 249, First Revisions FR 8412 (410.118) and FR 7745 (314.29) resulted in a correlation issue between CMP's 9 and 18. CMP 18 has purview over the use of luminaires, and CMP 9 defers to the position of CMP 18 regarding the permitted uses of luminaires as points of access to concealed wiring. Rather than duplicate or possibly conflict with actions taken in Article 410, CMP 9 is deleting Subsection (C) from 314.29. The result of this action effectively retains requirements from the 2017 NEC®, while improving the structure using the subsections developed during the First Draft Revision. With this approach, Subsection (C) is no longer necessary and any provision associated with luminaires would be confined to requirements outlined in Article 410.

Response Message: SR-8236-NFPA 70-2018 The proposed restructuring in public comment 1018 is unnecessary as all of 314.29(C) has been deleted.

Public Comment No. 900-NFPA 70-2018 [Section No. 314.29]

Public Comment No. 1018-NFPA 70-2018 [Section No. 314.29(C)]

Public Comment No. 1271-NFPA 70-2018 [Section No. 314.29(C)]

Second Revision No. 8166-NFPA 70-2018 [Section No. 404.2(C)]

(C) Switches Controlling Lighting Loads.

The grounded circuit conductor for the controlled lighting circuit shall be installed at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit serving bathrooms, hallways, stairways, ~~or rooms suitable for human habitation or occupancy~~ and habitable rooms or occupiable spaces as defined in the applicable building code. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded circuit conductor shall only be required at one location. A grounded conductor shall not be required to be installed at lighting switch locations under any of the following conditions:

(1) Where conductors enter the box enclosing the switch through a raceway, provided that the raceway is large enough for all contained conductors, including a grounded conductor

(2) Where the box enclosing the switch is accessible for the installation of an additional or replacement cable without removing finish materials

(3) Where snap switches with integral enclosures comply with 300.15(E)

(4) Where lighting in the area is controlled by automatic means

(5) Where a switch controls a receptacle load

The grounded conductor shall be extended to any switch location as necessary and shall be connected to switching devices that require line-to-neutral voltage to operate the electronics of the switch in the standby mode and shall meet the requirements of 404.22.

Exception: The connection requirement shall become effective on January 1, 2020. It shall not apply to replacement or retrofit switches installed in locations prior to local adoption of 404.2(C) and where the grounded conductor cannot be extended without removing finish materials. The number of electronic control switches on a branch circuit shall not exceed five, and the number connected to any feeder on the load side of a system or main bonding jumper shall not exceed 25. For the purpose of this exception, a neutral busbar, in compliance with 200.2(B) and to which a main or system bonding jumper is connected shall not be limited as to the number of electronic lighting control switches connected.

Informational Note: - The provision for a (future) grounded conductor is to complete a circuit path for electronic lighting control devices.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 12:34:14 EDT 2018

Committee Statement

Committee Statement: The revision uses defined terms in building code documents. The definition of a habitable room originates in NFPA 5000 and addresses residential applications. It will likely be in the 2020 NEC in Article 100. The terminology “habitable space” is defined in the International Building Code and addresses comparable locations in commercial and related spaces. Together, the two terms squarely address the intended reach of this requirement.

Response Message: SR-8166-NFPA 70-2018

Public Comment No. 581-NFPA 70-2018 [Section No. 404.2(C)]

Second Revision No. 8168-NFPA 70-2018 [Section No. 404.9(B)]

(B) Grounding.

Snap switches, dimmers, and control switches shall be connected to an equipment grounding conductor and shall provide a means to connect metal faceplates to the equipment grounding conductor, whether or not a metal faceplate is installed. Metal faceplates shall be bonded to the equipment grounding conductor. Snap switches, dimmers, ~~and~~ control switches, and metal faceplates shall be ~~considered~~ connected to ~~be part of an effective ground-fault current path if~~ an equipment grounding conductor using either of the following ~~conditions is met~~ methods :

(1) The switch is mounted with metal screws to a metal box or metal cover that is connected to an equipment grounding conductor or to a nonmetallic box with integral means for connecting to an equipment grounding conductor.

(2) An equipment grounding conductor or equipment bonding jumper is connected to an equipment grounding termination of the snap switch.

Exception No. 1 to (B): Where no means exists within the enclosure for bonding to the equipment grounding conductor, or where the wiring method does not include or provide an equipment grounding conductor, a snap switch without a connection to an equipment grounding conductor shall be permitted for replacement purposes only. A snap switch wired under the provisions of this exception and located within 2.5 m (8 ft) vertically, or 1.5 m (5 ft) horizontally, of ground or exposed grounded metal objects shall be provided with a faceplate of nonconducting noncombustible material with nonmetallic attachment screws, unless the switch mounting strap or yoke is nonmetallic or the circuit is protected by a ground-fault circuit interrupter.

Exception No. 2 to (B): Listed kits or listed assemblies shall not be required to be bonded to an equipment grounding conductor if all of the following conditions are met:

(1) The device is provided with a nonmetallic faceplate, and the device is designed such that no metallic faceplate replaces the one provided.

(2) The device does not have mounting means to accept other configurations of faceplates.

(3) The device is equipped with a nonmetallic yoke.

(4) All parts of the device that are accessible after installation of the faceplate are manufactured of nonmetallic materials.

Exception No. 3 to (B): A snap switch with integral nonmetallic enclosure complying with 300.15(E) shall be permitted without a bonding connection to an equipment grounding conductor.

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 12:42:44 EDT 2018

Committee Statement

Committee Statement: The parent language has been editorially modified to focus on the prescriptive requirement to make relevant connections to the equipment grounding conductor, and the acceptable methods to accomplish this. The additional wording in the comment that was taken from Article 517 is based on a differing context of redundant grounding in that special occupancy; the current methods as described are sufficient for Chapter 4.

Response Message: SR-8168-NFPA 70-2018

Public Comment No. 582-NFPA 70-2018 [Section No. 404.9(B)]

Second Revision No. 8170-NFPA 70-2018 [Section No. 404.14]

404.14 Rating and Use of Switches.

Switches shall be listed and used within their ratings ~~and as indicated in 404.14~~ . Switches of the types covered in (A) through (E) shall be limited to the control of loads as specified accordingly. Switches used to control cord- and plug-connected loads shall be limited as covered in (F).

Informational Note No. 1: For switches on signs and outline lighting, see 600.6.

Informational Note No. 2: For switches controlling motors, see 430.83, 430.109, and 430.110.

(A) Alternating-Current General-Use Snap Switch.

~~A~~ This form of ~~general-use snap~~ switch ~~suitable~~ shall only ~~for use~~ be used on ac circuits and used for controlling the following:

(1) Resistive and inductive loads not exceeding the ampere rating of the switch at the voltage applied

(2) Tungsten-filament lamp loads not exceeding the ampere rating of the switch at 120 volts

(3) Electric discharge lamp loads not exceeding the marked ampere and voltage rating of the switch

(4) Motor loads not exceeding 80 percent of the ampere rating of the switch at its rated voltage

(5) Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied

(B) Alternating-Current or Direct-Current (AC-DC) General-Use Snap Switch.

~~A~~ This form of ~~general-use snap switch suitable for use~~ switch shall be permitted on either ac or dc circuits and used only for controlling the following:

(1) Resistive loads not exceeding the ampere rating of the switch at the voltage applied.

(2) Inductive loads not exceeding 50 percent of the ampere rating of the switch at the applied voltage. Switches rated in horsepower are suitable for controlling motor loads within their rating at the voltage applied.

(3) Tungsten-filament lamp loads not exceeding the ampere rating of the switch at the applied voltage if T-rated.

(4) Electonic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding the ampere rating of the switch at the voltage applied.

(C) CO/ALR Snap Switches.

Snap switches directly connected to aluminum conductors and rated 20 amperes or less ~~directly connected to aluminum conductors~~ shall be ~~listed and~~ marked CO/ALR.

(D) Alternating-Current General-Use Snap Switches Rated for 347 Volts.

~~Snap switches rated 347 volts ac~~ This form of switch shall be ~~listed and~~ used only for controlling the loads permitted by 404.14(D)(1), (D)(2), and (D)(3). These switches shall not be rated less than 15 amperes at a voltage of 347 volts ac, and they shall not be readily interchangeable in box mounting with switches covered in 404.14(A) and (B).

(1) Noninductive Loads.

Noninductive loads other than tungsten-filament lamps not exceeding the ampere and voltage ratings of the switch.

(2) Inductive Loads.

Inductive loads not exceeding the ampere and voltage ratings of the switch. Where particular load characteristics or limitations are specified as a condition of the listing, those restrictions shall be observed regardless of the ampere rating of the load.

The ampere rating of the switch shall not be less than 15 amperes at a voltage rating of 347 volts ac. Flush-type snap switches rated 347 volts ac shall not be readily interchangeable in box mounting with switches identified in 404.14(A) and (B).

(3) Lighting Loads.

~~404.14~~

Electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamp loads with their associated drivers, not exceeding 20 amperes and not exceeding the ampere rating of the switch at the voltage applied.

~~The ampere rating of the switch shall not be less than 15 amperes at a voltage rating of 347 volts ac. Flush-type snap switches rated 347 volts ac shall not be readily interchangeable in box mounting with switches identified in~~

(

~~A) and (B).~~

(E) Dimmer and Electronic Control Switches.

General-use dimmer switches shall be used only to control permanently installed incandescent luminaires unless listed for the control of other loads and installed accordingly. Other electronic control switches, such as timing switches and occupancy sensors, shall be used to control permanently connected loads. They shall be marked by their manufacturer with their current and voltage ratings and used for loads that do not exceed their ampere rating at the voltage applied.

(F) Cord- and Plug-Connected Loads.

Where a snap switch or control device is used to control cord- and plug-connected equipment on a general-purpose branch circuit, each snap switch or control device controlling receptacle outlets or cord connectors that are supplied by permanently connected cord pendants shall be rated at not less than the rating of the maximum permitted ampere rating or setting of the overcurrent device protecting the receptacles or cord connectors, as provided in 210.21(B).

Informational Note: See 210.50(A) and 400.10(A)(1) for equivalency to a receptacle outlet of a cord connector that is supplied by a permanently connected cord pendant.

Exception: Where a snap switch or control device is used to control not more than one receptacle on a branch circuit, the switch or control device shall be permitted to be rated at not less than the rating of the receptacle.

Supplemental Information

File Name	Description	Approved
70_SR8170_404.14.docx	FOR STAFF USE	

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 12:46:04 EDT 2018

Committee Statement

Committee Statement: Although the first revision text was in fact mandatory through the operation of the parent language, CMP 9 has taken the opportunity to reformat the section in ways that eliminate some unnecessary duplication and that improve clarity.

Response Message: SR-8170-NFPA 70-2018

Public Comment No. 922-NFPA 70-2018 [Section No. 404.14]

Second Revision No. 8171-NFPA 70-2018 [Section No. 408.6]

408.~~6~~ 6 Short-Circuit Current Rating.

Switchboards, switchgear, and panelboards shall ~~be rated for~~ have a short-circuit current rating not less than the available ~~short-circuit~~ fault current. ~~The available short-circuit~~ In other than one- and two-family dwelling units, the available fault current and the date the calculation was performed shall be ~~documented and made available to those authorized to inspect the installation.~~ field marked on the enclosure at the point of supply. The marking shall comply with 110.21(B)(3).

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 13:14:31 EDT 2018

Committee Statement

Committee Statement: These changes implement the Correlating Committee directive regarding standardized wording with respect to fault current. The wording is selected to ensure the correct terms are used for the rating of the equipment (“Short-Circuit Current Rating") and the standardized wording for the “available fault current”. The panel also agrees with the utility of a field marking in terms of being readily available to maintenance staff confronting the necessity of evaluating protective gear when necessary. The panel also notes, however that the marking needs some limitation for practicality, and has limited the reach of the requirement by excluding one- and two-family dwellings, in a manner similar to 110.24.

Response Message: SR-8171-NFPA 70-2018 The panel also concludes that public comment 282 adds some complexity and duplication of message without adding requirements. The legibility and durability requirements duplicate 110.21(B)(3) and the reference is sufficient.

Public Comment No. 282-NFPA 70-2018 [Section No. 408.6]

Public Comment No. 1414-NFPA 70-2018 [Section No. 408.6]

Public Comment No. 927-NFPA 70-2018 [Section No. 408.5]

Second Revision No. 8172-NFPA 70-2018 [New Section after 408.7]

408.8 Reconditioning of Equipment.

Reconditioning of equipment within the scope of this article shall be limited as described in (A) and (B). The reconditioning process shall use design qualified parts verified under applicable standards, and be performed in accordance with any instructions provided by the manufacturer. If equipment has been damaged by fire, products of combustion, or water, it shall be specifically evaluated by its manufacturer or a qualified testing laboratory prior to being returned to service.

(A) Panelboards.

Panelboards shall not be permitted to be reconditioned. This shall not prevent the replacement of a panelboard within an enclosure. In the event the replacement has not been listed for the specific enclosure, and the available fault current is greater than 10,000 amperes, the completed work shall be field labeled, and any previously applied listing marks on the cabinet that pertain to the panelboard shall be removed.

(B) Switchboards and Switchgear.

Switchboards and switchgear, or sections of switchboards or switchgear, shall be permitted to be reconditioned. Reconditioned switchgear shall be listed or field labeled as “reconditioned” and previously applied listing marks, if any, within the portions reconditioned shall be removed.

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 13:20:32 EDT 2018

Committee Statement

Committee Statement: This new section squarely addresses reconditioning, including a severe limitation in the parent language with respect to attempts to recondition smoke, fire, or flood damaged equipment. The opening text also includes provisions on part selection and reconditioning procedures from the NEMA reconditioning paper. The requirements in the parent language are intended to apply to the agency performing the listing or field labeling. These provisions are actual requirements that appear under the NEMA “Definition” subhead; they must be located here and not in the actual definition.

Panelboards are defined as encompassing the bus structure but not the enclosure, typically a cabinet. This is fundamentally different from switchboards and switchgear. Therefore, CMP 9 is crafting different protocols based on these differences. Panelboard listings are available for bus structures that can be field mounted in enclosures, as is appropriate. The buswork itself is unlikely to be fit for reconditioning, but replacement is generally an option with field inspection and without additional listing. The exception to this is when the available fault current exceeds 10,000 amperes. In such cases, the enclosure must be evaluated in conjunction with the panel bus.

Switchboards and switchgear can be reconditioned, and typically that work is done in place due to the inherent construction difficulties and expense in removing and reinstalling it. In such cases the best approach to assuring safety before restoring to service will involve a field evaluation. In addition, the wording allows for section by section decisions relative to how to proceed. In some cases an accident may damage a section but not warrant condemning an entire line-up.

The term "reconditioned equipment" will appear in numerous locations and is being covered in other second revisions.

Response Message: SR-8172-NFPA 70-2018 The portion of the Comment 987 addressing the reconditioning of medium voltage gear has merit but is out of scope in Article 408. This new section is carefully coordinated with the new 408.8, and fully incorporates the reconditioning concept in Article 490 to address this issue.

Public Comment No. 987-NFPA 70-2018 [New Section after 408.7]

Second Revision No. 8180-NFPA 70-2018 [Section No. 408.18(C)]

(C) Connections.

Each section of equipment that requires rear or side access to make field connections shall be so marked by the manufacturer on the front. Section openings requiring rear or side access shall comply with 110.26. Load terminals for field wiring shall comply with 408.18(C)(1) ~~or~~ , (C)(2), or (C)(3) as applicable.

(1) Equipment Grounding ~~and Grounded Circuit~~ Conductors.

Load terminals for field wiring shall be so located that it is not necessary to reach across uninsulated ungrounded bus in order to make connections.

(2) Grounded Circuit Conductors

Where multiple branch or feeder grounded circuit conductor load terminals for field wiring are grouped together in one location they shall be so located that it is not necessary to reach across uninsulated ungrounded bus, whether or not energized, in order to make connections .

Where only one branch or feeder set of load terminals for field wiring are grouped with its associated ungrounded load terminals they shall be so located that it is not necessary to reach across energized uninsulated bus including other branch or feeder bus in order to make connections. Bus on the line side of service, branch, or feeder disconnects is considered energized with respect to its associated load side circuits.

(3) Ungrounded Conductors.

Load terminals for ungrounded conductors shall be so located that it is not necessary to reach across energized uninsulated bus in order to make connections. Bus on the line side of service, branch, or feeder disconnects is considered energized with respect to its associated load side circuits.

Supplemental Information

File Name	Description	Approved
70_SR8180_408.18_C_.docx	FOR STAFF USE	

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 14:24:57 EDT 2018

Committee Statement

Committee Statement: Where multiple branch or feeder grounded circuit conductor load terminals for field wiring are grouped together in one location multiple branch or feeder disconnects would need to be opened before accessing the grounded circuit conductor load terminals of an individual circuit. Because of the need to open numerous disconnects these grounded circuit conductor load terminals it would be helpful to locate them so that it is not necessary to reach across uninsulated ungrounded bus in order to make connections.

If only one branch or feeder grounded and ungrounded load terminals are grouped in the same area then only the one disconnect would need to be opened to access the grounded circuit conductor load terminals of that individual circuit. Since opening that individual disconnect would de-energize the normally energized ungrounded load conductors the grounded and ungrounded load conductors can be treated the same. Also, in many cases it is not realistic for grounded conductor terminals to be in front of phase terminals and their associated bus on large feeders where there are a large number of cables per phase and the phase terminals must be mounted on bus attached to the overcurrent protective device terminals. There also may be circuit breaker restrictions due to arc vent requirements and size restrictions.

CMP 9 has added phrasing to the first paragraph of (B) to fully clarify that these requirements do not depend on an expectation that the work will only be done de-energized. The consequence of a

dropped tool on energized bus is so extreme that even if full PPE is deployed, the collateral damage easily meets the threshold for CMP 9 to prevent those consequences. However, a grouped bus arrangement limited to the circuit being worked on is an acceptable compromise, as covered in the second paragraph, because such a circuit would necessarily never be worked while energized.

Response Message: SR-8180-NFPA 70-2018

Public Comment No. 57-NFPA 70-2018 [Section No. 408.18(C)]

Second Revision No. 8185-NFPA 70-2018 [Section No. 408.36 [Excluding any Sub-Sections]]

In addition to the requirement of 408.30, a panelboard shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.

Exception No. 1: Individual protection shall not be required for a panelboard ~~used as service equipment with multiple disconnecting means in accordance with 230.71 . In panelboards~~ protected by ~~three or more main circuit breakers or sets of fuses, the circuit breakers or sets of fuses shall not supply a second bus structure within the same panelboard assembly. Exception No. 2: Individual protection shall not be required for a panelboard protected on its supply side by~~ two main circuit breakers or two sets of fuses in other than service equipment, having a combined rating not greater than that of the panelboard. A panelboard constructed or wired under this exception shall not contain more than 42 overcurrent devices. For the purposes of determining the maximum of 42 overcurrent devices, a 2-pole or a 3-pole circuit breaker shall be considered as two or three overcurrent devices, respectively.

Exception No. ~~3~~ 2 : For existing panelboards, individual protection shall not be required for a panelboard used as service equipment for an individual residential occupancy.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 16:11:07 EDT 2018

Committee Statement

Committee Statement: This second revision is necessary due to the first draft revisions in 230.71 by FR 8463. See Correlating Committee Note 268 that additionally directs CMP-9 to correlate this section with 230.71 as revised. This requires the complete deletion of exception No.1 and the modification of exception No.2 to clarify that it does not apply to service equipment.

Response Message: SR-8185-NFPA 70-2018

Public Comment No. 929-NFPA 70-2018 [Section No. 408.36]

Public Comment No. 1114-NFPA 70-2018 [Section No. 408.36]

Second Revision No. 8186-NFPA 70-2018 [Section No. 408.40]

408.40 Grounding of Panelboards.

Panelboard cabinets and panelboard frames, if of metal, shall be in physical contact with each other and shall be connected to an equipment grounding conductor. Where the panelboard is used with nonmetallic raceway or cable or where separate equipment grounding conductors are provided, a terminal bar for the equipment grounding conductors shall be secured inside the cabinet. The terminal bar shall be bonded to the cabinet and panelboard frame, if of metal; otherwise it shall be connected to the equipment grounding conductor that is run with the conductors feeding the panelboard.

Exception: Where an isolated equipment grounding conductor for a branch circuit or a feeder is provided as permitted by 250.146(D), the insulated equipment grounding conductor that is run with the circuit conductors shall be permitted to pass through the panelboard without being connected to the panelboard's equipment grounding terminal bar.

Equipment grounding conductors shall not be connected to a terminal bar provided for grounded conductors or neutral conductors unless the bar is identified for the purpose and is located where interconnection between equipment grounding conductors and grounded circuit conductors is permitted or required by Article 250.

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 16:18:23 EDT 2018

Committee Statement

Committee Statement: CMP 9 is now including language in the existing exception that specifies applicability to both branch circuits and feeders, which will provide the desired clarification.

Response Message: SR-8186-NFPA 70-2018

Public Comment No. 1004-NFPA 70-2018 [Section No. 408.40]

Second Revision No. 8240-NFPA 70-2018 [New Section after 408.41]

408.43 Panelboard Orientation.

Panelboards shall not be installed in the face-up position.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 20:20:44 EDT 2018

Committee Statement

Committee Statement: A new section is added to prohibit panelboards from being installed in a face-up position as this mounting orientation increases the likelihood that contaminants accumulate on the breakers and panelboard bussing, creating a hazard, and additionally creates a challenge with applying work space requirements. Note that this new limitation does not prohibit the mounting of a panelboard in a horizontal face-down position. This action was part of a first revision from CMP 10 (240.33), and is now relocated to Article 408, as CMP 9 concludes that this material is within the scope of that Article.

Response Message: SR-8240-NFPA 70-2018

Second Revision No. 8188-NFPA 70-2018 [Section No. 408.56]

408.56 Minimum Spacings.

The distance between uninsulated metal parts, busbars, and other uninsulated live parts shall not be less than specified in Table 408.56.

Where close proximity does not cause excessive heating, parts of the same polarity at switches, enclosed fuses, and so forth shall be permitted to be placed as close together as convenience in handling will allow.

Exception: The distance shall be permitted to be less than that specified in Table 408.56 at circuit breakers and switches and in listed components installed in switchboards, switchgear, and panelboards.

Table 408.56 Minimum Spacings Between Bare Metal Parts

AC or DC Voltage	Opposite Polarity Where Mounted on the Same Surface		Opposite Polarity Where Held Free in Air		Live Parts to Ground*	
	mm	in.	mm	in.	mm	in.
Not over 125 volts, nominal	19.1	¾	12.7	½	12.7	½
Not over 250 volts, nominal	31.8	1¼	19.1	¾	12.7	½
Not over 1000 volts, nominal	50.8	2	25.4	1	25.4	1

*For spacing between live parts and doors of cabinets, ~~see~~ dimensions in 312.11(A) ~~(1), (2), and (3)~~ apply.

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 16:22:07 EDT 2018

Committee Statement

Committee Statement: CMP 9 has reworded the note so it uses unambiguous, mandatory language.
Response Message: SR-8188-NFPA 70-2018

Public Comment No. 930-NFPA 70-2018 [Section No. 408.56]

Second Revision No. 8191-NFPA 70-2018 [Section No. 450.2 [Excluding any Sub-Sections]]

~~For the purpose of this article, the following definition shall apply~~ [450.2]

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

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 16:47:43 EDT 2018

Committee Statement

Committee Statement: The parent text has been modified to comply with the direction of the Correlating Committee.

Response Message: SR-8191-NFPA 70-2018

Public Comment No. 2141-NFPA 70-2018 [Section No. 450.2]

Public Comment No. 1005-NFPA 70-2018 [Section No. 450.2]

Second Revision No. 8197-NFPA 70-2018 [Section No. 450.9]

450.9 Ventilation.

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

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

Informational Note No. 2: Additional losses ~~may~~ occur in some transformers where nonsinusoidal currents are present, resulting in increased heat in the transformer above its rating. See IEEE C57.110-2008, *Recommended Practice for Establishing Liquid-Filled and Dry-Type Power and Distribution Transformer Capability When Supplying Nonsinusoidal Load Currents*, where transformers are utilized with nonlinear loads.

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

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 17:12:48 EDT 2018

Committee Statement

Committee Statement: The word "may" has been deleted to eliminate concern of permissive use.

Response Message: SR-8197-NFPA 70-2018

Public Comment No. 1015-NFPA 70-2018 [Section No. 450.9]

Second Revision No. 8201-NFPA 70-2018 [Section No. 450.21(B)]

(B) Over 112½ kVA.

Individual dry-type transformers of more than 112½ kVA rating shall be installed in a transformer room of fire-resistant construction ~~. Unless specified otherwise in this article, the term *fire resistant* means a construction~~ having a minimum fire rating of ~~1 hour~~ 1 hour .

Exception No. 1: Transformers with Class 155 or higher insulation systems and separated from combustible material by a fire-resistant, heat-insulating barrier or by not less than 1.83 m (6 ft) horizontally and 3.7 m (12 ft) vertically.

Exception No. 2: Transformers with Class 155 or higher insulation systems and completely enclosed except for ventilating openings.

Informational Note: See ASTM E119-~~16a~~ 18a , *Standard Test Methods for Fire Tests of Building Construction and Materials*.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 17:33:11 EDT 2018

Committee Statement

Committee Statement: The ASTM E-119 reference standard was updated to the current edition.

A phrase has also been reworded to create mandatory language to comply with the NEC Style Manual.

Response Message: SR-8201-NFPA 70-2018

Public Comment No. 1080-NFPA 70-2018 [Section No. 450.21(B)]

Public Comment No. 517-NFPA 70-2018 [Section No. 450.21]

Second Revision No. 8203-NFPA 70-2018 [Sections 450.23(A), 450.23(B)]

Sections 450.23(A), 450.23(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:

(2) The transformer is rated 35,000 volts or less.

(3) No combustible materials are stored.

(4) A liquid confinement area is provided.

(5) The installation complies with all the restrictions provided for in the listing of the liquid.

Informational Note: Such restrictions

~~may~~

a.

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.

(6) ~~An~~ Where an automatic fire extinguishing system and a liquid confinement area is present , provided the transformer is rated 35,000 volts or less

(7) ~~Section~~ Where the installation complies with 450.26

(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, where installed in accordance with (1) or (2).

(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: Installations adjacent to combustible material, fire escapes, or door and window openings may require additional safeguards such as those listed in 450.27.

Informational Note No. 2: Such restrictions ~~may~~ 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.

(2) In accordance with 450.27.

Informational Note No. 1: As used in this section, *Type I and Type II buildings* refers to Type I and Type II building construction as defined in NFPA 220-2018, *Standard on Types of Building Construction*. *Combustible materials* refers to those materials not classified as noncombustible or limited-combustible as defined in NFPA 220-2018, *Standard on Types of Building Construction*.

Informational Note No. 2: See definition of *Listed* in Article 100.

Supplemental Information

File Name	Description	Approved
70_SR8203_450.23_A_-_B_.docx	FOR STAFF USE	

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 17:42:08 EDT 2018

Committee Statement

Committee Statement: The word “may” has been replaced with "can" in the 450.23(A)(1)(d) and 450.23(B)(1) Informational Notes.

Editorial revisions are made in 450.23(A)2 and 3 to provide clear and enforceable language.

Response Message: SR-8203-NFPA 70-2018

Public Comment No. 2001-NFPA 70-2018 [Section No. 450.23(A)]

Public Comment No. 1079-NFPA 70-2018 [Section No. 450.23(A)]

Second Revision No. 8205-NFPA 70-2018 [Section No. 450.42]

450.42 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. 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. For the purposes of this section, studs and wallboard construction shall not be permitted.

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

Informational Note No. 1: For additional information, see ASTM E119-~~16a~~ 18a , *Methods for Fire Tests of Building Construction and Materials*.

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

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 17:53:41 EDT 2018

Committee Statement

Committee Statement: The reference standard ASTM E119 has been updated to the current edition.
Response Message: SR-8205-NFPA 70-2018

Public Comment No. 518-NFPA 70-2018 [Section No. 450.42]

Second Revision No. 8207-NFPA 70-2018 [Section No. 490.2]

490.2 Definition.

The definition in this section shall apply only within this article.

High Voltage.

~~For the purposes of this article,~~ A potential difference of more than 1000 volts, nominal.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 17:56:05 EDT 2018

Committee Statement

Committee Statement: The title has been updated to correlate with the global effort to provide guidance on definitions throughout the NEC. Necessary editorial changes are made to the definition of "High Voltage" to correlate with the update.

Response Message: SR-8207-NFPA 70-2018

Public Comment No. 1068-NFPA 70-2018 [Section No. 490.2]

Public Comment No. 2136-NFPA 70-2018 [Section No. 490.2]

Second Revision No. 8212-NFPA 70-2018 [Section No. 490.21(A)(4)]

(4) Rating.

Circuit breakers shall have the following ratings:

(1) The continuous current rating of a circuit breaker shall not be less than the maximum continuous current through the circuit breaker.

(2) The interrupting rating of a circuit breaker shall not be less than the ~~maximum~~ available fault current the circuit breaker will be required to interrupt, including contributions from all connected sources of energy.

(3) The closing rating of a circuit breaker shall not be less than the maximum asymmetrical fault current into which the circuit breaker can be closed.

(4) The momentary rating of a circuit breaker shall not be less than the maximum asymmetrical fault current at the point of installation.

(5) The rated maximum voltage of a circuit breaker shall not be less than the maximum circuit voltage.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 18:18:01 EDT 2018

Committee Statement

Committee Statement: The term “maximum” has been replaced in list item (2) with “available “ to correlate with the added definition in Article 100. The term "maximum" is retained as it applies to asymmetrical fault current in multiple locations because the phrase "available asymmetrical fault current" is not defined in the NEC.

Response Message: SR-8212-NFPA 70-2018

Public Comment No. 1065-NFPA 70-2018 [Section No. 490.21(A)(4)]

Second Revision No. 8215-NFPA 70-2018 [Section No. 490.21(B)(2)]

(2) Interrupting Rating.

The interrupting rating of power fuses shall not be less than the ~~maximum~~ available fault current the fuse is required to interrupt, including contributions from all connected sources of energy.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 18:32:58 EDT 2018

Committee Statement

Committee Statement: The term “maximum” has been replaced with “available “ to correlate with the added definition in Article 100.

Response Message: SR-8215-NFPA 70-2018

Public Comment No. 1064-NFPA 70-2018 [Section No. 490.21(B)(2)]

Second Revision No. 8216-NFPA 70-2018 [Section No. 490.21(C)(3)]

(3) Interrupting Rating.

The interrupting rating of distribution cutouts shall not be less than the ~~maximum~~ available fault current the cutout is required to interrupt, including contributions from all connected sources of energy.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 18:34:31 EDT 2018

Committee Statement

Committee Statement: The term “maximum” has been replaced with “available “ to correlate with the added definition in Article 100.

Response Message: SR-8216-NFPA 70-2018

Public Comment No. 1063-NFPA 70-2018 [Section No. 490.21(C)(3)]

Second Revision No. 8217-NFPA 70-2018 [Section No. 490.21(D)(2)]

(2) Interrupting Rating.

The interrupting rating of oil-filled cutouts shall not be less than the ~~maximum~~ available fault current the oil-filled cutout is required to interrupt, including contributions from all connected sources of energy.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 18:35:36 EDT 2018

Committee Statement

Committee Statement: The term “maximum” has been replaced with “available “ to correlate with the added definition in Article 100.

Response Message: SR-8217-NFPA 70-2018

Public Comment No. 1059-NFPA 70-2018 [Section No. 490.21(D)(2)]

Second Revision No. 8219-NFPA 70-2018 [Section No. 490.21(E) [Excluding any Sub-Sections]]

Load-interrupter switches shall be permitted if suitable fuses or circuit breakers are used in conjunction with these devices to interrupt available fault currents. Where these devices are used in combination, they shall be coordinated electrically so that they will safely withstand the effects of closing, carrying, or interrupting all possible currents up to the assigned maximum short-circuit rating.

Where more than one switch is installed with interconnected load terminals to provide for alternate connection to different supply conductors, each switch shall be provided with a conspicuous sign identifying this hazard.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 18:41:28 EDT 2018

Committee Statement

Committee Statement: The term “available “ has been added to correlate with the added definition in Article 100.

Response Message: SR-8219-NFPA 70-2018

Public Comment No. 1054-NFPA 70-2018 [Section No. 490.21(E) [Excluding any Sub-Sections]]

Second Revision No. 8220-NFPA 70-2018 [Section No. 490.25]

490.25 Backfeed.

Installations where the possibility of backfeed exists shall comply with 490.25(A) and (B), which follow.

(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.

Submitter Information Verification

Committee: NEC-P09
Submittal Date: Thu Nov 01 18:43:43 EDT 2018

Committee Statement

Committee Statement: Titles have been created for first level subdivisions (A) and (B) as required by the NEC Style Manual.
Response Message: SR-8220-NFPA 70-2018

Public Comment No. 1226-NFPA 70-2018 [Section No. 490.25]

Second Revision No. 8222-NFPA 70-2018 [New Section after 490.48]

490.49 Reconditioned Switchgear.

Switchgear, or sections of switchgear, within the scope of this article shall be permitted to be reconditioned. The reconditioning process shall use design qualified parts verified under applicable standards, and be performed in accordance with any instructions provided by the manufacturer. Reconditioned switchgear shall be listed or field labeled as “reconditioned” and previously applied listing marks, if any, within the portions reconditioned shall be removed . If equipment has been damaged by fire, products of combustion, or water, it shall be specifically evaluated by its manufacturer or a qualified testing laboratory prior to being returned to service.

Submitter Information Verification

Committee: NEC-P09

Submittal Date: Thu Nov 01 18:48:37 EDT 2018

Committee Statement

Committee Statement: Switchgear can be reconditioned, and typically that work is done in place due to the inherent construction difficulties and expense in removing an reinstalling it, and in such cases the best approach to assuring safety before restoring to service will involve a field evaluation. CMP 9 has reviewed the current status of listing coverage for medium voltage work and concludes that field labeling is a viable approach at this time for medium voltage equipment such as this that is not being completely reinstalled. In addition, the wording allows for section by section decisions relative to how to proceed. In some cases an accident may damage a section but not warrant condemning an entire line-up. The text also includes provisions on part selection and reconditioning procedures from the NEMA reconditioning paper. These provisions are actual requirements that appear under its “Definition” subhead; they must be located here and not in the actual definition.

Response Message: SR-8222-NFPA 70-2018