NEC® Code-Making Panel 12 First Draft Meeting Agenda

January 21 - 23, 2024

Charleston, SC

Item No.	Subject
24-01-01	Call to Order, Chair
24-01-02	Introductions (Attachment: Committee Roster)
24-01-03	Approval of Previous Meeting Minutes (Attachment)
24-01-04	Staff Updates, NFPA Staff
24-01-05	Overview of NFPA Process
24-01-06	Review of Public Inputs (Attachment: Public Input Report)
	a. Task Group Recommendations
24-01-07	Old Business
24-01-08	New Business
24-01-09	Adjourn

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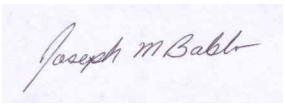
NEC® Code-Making Panel 12 Second Draft Chair Report

Signature: 

Date of Meeting:

1. List names of NEC® Code-Making Panel Members in Attendance:

Joe Bablo – Chair	Clinton Summers
Phil Clark	Jim Tarchinski
Karl Cunningham	Rob Turner
Joel Goergen	Doug Burkett
Jody Greenwood	Tim Croushore
Doug Henderson	Scott Emerson
Andrew Hernandez	Martin Flanagan
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Todd Konieczny	Joe Prisco
Todd Lottmann	Steve Rood
Jim Murnan	Rick Shawbell
Karl Reighard	Gilbert Soliz
Edward Rodriguez	Emad Tabatabaei

2. List names of Guests in Attendance:

Kevin Arnold	Megan Hayes
Quentin Cowans	Bryan Holland
Cory Hannahs	Sunny Kalola
Tom Harris	David Williams

3. List names of Guests who addressed the Panel, the subject of their presentation and the length of time they spoke:

   Not applicable – no guests addressed the panel.

4. Number of Public Inputs/Comments acted upon:

A total of 107 Public Comments were addressed, include PC 1480 which was re-assigned to CMP12.

5. Number of Second Revisions Created:

A total of 69 Second Revisions were created.

6. List any Task Groups appointed to work subsequent to the Second Draft Meeting, along with the names of Task Group Chair/members:

No Task Groups were appointed subsequent to the Second Draft Meeting.

7. List any Public Comment or Second Revision that may need to be referred to another Panel for information or correlation:

There are no Public Comments or Second Revisions that need to be referred.

8. List any Public Input/Comment that requires NEC® Correlating Committee attention:

- PC954 and PC1679 were both "Reject But See" and covered by Second Revision 7585 (Paragraph 630.8). This Second Revision should be correlated with any changes to 210.8 that make reference to welding laboratories. If CMP2 does not add welding laboratories to 210.8, then this Second Revision is needed.

- PC230 and PC231 both deal with changing numbered references. These are associated with PC205, PC208, and PC209. When those PCs are processed the reference changes in PC230 and PC231 should be checked to verify that they are still correct.

- CMP-12 has created SR 7736 revising the definition of Cable Management System. This second revision results in a generic definition that will apply

throughout the code. Based on this, the definition for Cable Management System should be reassigned to CMP1 and the "(CMP-12)" tag should be deleted from the end of the definition.

9. List any general requests for information or assistance from the NEC® Correlating Committee:

- There is general consensus that cybersecurity will become a more significant issue for future code cycles. CMP12 suggests that a task group be put together to determine how to apply cybersecurity requirements consistently throughout the code rather than attempting to drive that consistency through public input. See PC420 and PC432 for examples.

- Now that Article 100 does not have any parts, references to Article 100 for definitions do not comply with the NEC Style Manual. See PC973 for an example. In this example, the reference is in the informational note, but there are most likely instances of this in the main text as well. Is this reference to Article 100 acceptable? If so, CMP12 requests that this exception be added to the NEC Style Manual.

10. List any issues that should be brought to the attention of the NFPA Research Foundation:

None at this time.

11. List any additional information that would be helpful to the NEC® Correlating Committee, NFPA Staff, or process in general:

Nothing additional to add.

Public Input No. 3085, Assigned to Code-Making Panel 1, Refer to Code-Making Panels 2 - 18

Public Input No. 3085-NFPA 70-2023 [Global Input]

This Global Public Input is for all Technical Committees and review their informational notes and the requirements in the NEC Style Manual Section 2.1.10 for informational notes.

Statement of Problem and Substantiation for Public Input

This Global Public Input is for all Technical Committees and review their informational notes and the requirements in the NEC Style Manual Section 2.1.10 for informational notes.
2.1.10.3 Format. Informational notes shall be structured as shown in the example, using the word “See” followed by the reference standard, the title of the standard and section if used, and an explanation for the reference.
Example:
"See" "Referenced Standard", "Standard Title", "Section Number", "Explanation of the reference"
Informational Note: See NFPA 101, Life Safety Code, 7.8, for illumination of means of egress.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Public Input No. 3086, Assigned to Code-Making Panel 2, Refer to Code Making Panels 3 - 18

Public Input No. 3086-NFPA 70-2023 [Global Input]

**This Global Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document.
Articles may need to be revised to comply with the NEC Style Manual Section 2.2 for Numbering Conventions.**

Statement of Problem and Substantiation for Public Input

This Global Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document.
Articles may need to be revised to comply with the NEC Style Manual Section 2.2 for Numbering Conventions. The Changes in 2.2.1 are requirements that may need to be revised.
2.2.1 Parallel Numbering Required. Technical committees shall use the following section numbers for the same purposes within articles. This requirement shall not apply to Articles 90, 100, and 110. If the article does not contain listing or reconditioning
requirements, the subdivisions shall not be included in the article.
Required Parallel Numbering Format
XXX.1 Scope.
XXX.2 Listing Requirements.
XXX.3 Reconditioned Equipment.
XXX.3(A) Permitted to be Installed.
XXX.3(B) Not Permitted to be Installed.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Public Input No. 3099, Assigned to Code-Making Panel 15, Refer to Code-Making Panels 3, 4, 6, 10, 11, 12, 13, 14, 16, 17 and 18

Public Input No. 3099-NFPA 70-2023 [Global Input]

Add Informational Notes to Scopes identifying Article specific and/or important definitions in one of the following formats:

Format A – the style used in NFPA Link's Enhanced Content material:

Informational Note No. x: Definitions. Each of the following terms has a definition in Article 100 that is unique to its use in "Article xxx":

Term 1

Term 2

Term 3

...

If needed:

Informational Note No. y: Definitions. Each of the following terms has a definition in Article 100 that appears in several articles but is important in its use in "Article xxx":

Term a

Term b

Term c

...

Format B – the style used in several places within the NEC itself:

Informational Note: See Article 100 for definitions of Term 1, Term 2, and Term 3 . . .

Statement of Problem and Substantiation for Public Input

The change to locations of definitions in the 2023 Edition of the NEC was controversial for many people because it reduced usability. Even though other NFPA codes and standards use this structure and was stated as a justification to the change in the 'NEC Style Manual' (some NFPA codes and standards include definitions within articles *), many believe this relocation leads to confusion among users, especially for those articles that are specialty topics – i.e., the articles in Chapters 5 through 8. There are over 37 pages of definitions in Article 100 to search through.

Common language terms often have more specific meanings within an article. One only needs to look at the multiple definitions for 'Portable Equipment' to get a sense of this issue. While the term 'Directly Controlled Emergency Luminaire' used in Article 700 seems self-explanatory, the actual definition is quite important. Without the proximate reference within Article 700, that distinction is not clear.

Article 200 does the following:
200.1 Scope.
This article provides requirements for the following:
(1) Identification of terminals
(2) Grounded conductors in premises wiring systems
(3) Identification of grounded conductors
Informational Note: See Article 100 for definitions of Grounded Conductor, Equipment Grounding Conductor, and Grounding Electrode Conductor.

Article 380 also adds a definition reference in an Informational Note to the scope.

There are approximately 30 references to Article 100 definitions within specific sections of the Code.

Under the current structure, important specialty definitions are lost in the sheer size of the Article 100 list. The usability of the NEC has been damaged, and users of specialty articles in Chapters 5 through 8 need help with this structure.

To restore the usability of the NEC, what is needed is a way to clearly identify and point to specialty definitions in a standardized location within articles (like we used to have with the .2 sections), while leaving the definitions themselves in Article 100. NFPA Link and the NEC Handbook add this information as Enhanced Content. Additionally, this “definition identification” model has proven its usability in other codes such as NFPA 1, NFPA 99, and NFPA 101. The NEC deserves no less.
* Example: NFPA 101 – Section 6.1.2.1 ‘Assembly Occupancy’ is one of several definitions in an Article; and in this instance it is duplicated from 3.3.205.2]. In fact, there are multiple definitions throughout NFPA 101.

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Public Input No. 4050, Assigned to Code-Making Panel 10, Refer to Code-Making Panels 1 - 9 and 11 - 18

Public Input No. 4050-NFPA 70-2023 [Global Input]

Review the terms regarding overcurrent protection and determine if the correct term is being used.

(1) Branch-Circuit Overcurrent Protective Device

(2) Current-Limiting Overcurrent Protective Device

(3) Current-Limiting

(4) Current-Limiting Overcurrent

(5) Overcurrent Protection

(6) Overcurrent Protection Device

(7) Overcurrent Protective Device

(8) Supplementary Overcurrent Protective Device

(9) Supplementary Overcurrent Protection

Statement of Problem and Substantiation for Public Input

The defined terms regarding overcurrent protection need to be reviewed by all code making panels and determine if the correct term is being used. The code has too many terms regarding overcurent protection, some that are defined and some that are not defined. These terms are often used interchangeably in the wrong context.

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Public Input No. 4287, Assigned to Code-Making Panel 1, Refer to Code-Making Panels 2 - 18

Public Input No. 4287-NFPA 70-2023 [Global Input]

Clearly identify any requirements which are not applicable to DC circuits by incorporating the recommended terminology as applicable:

“Applicable to…[ac][single-phase][three-phase][wye][delta] circuits only”.

“Not applicable to dc circuits”

“[Volts] ac only”

Other terminology that clearly applies to a specific ac (or dc) application, such as through a defined term or unique equipment.

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of a Correlating Committee DC Task Group consisting of Danish Zia, Jason Fisher, Randy Dollar, Larry Wildermuth, Scott Higgins, Scott Harding, Mark Earley, Jason Hopkins, Christopher Vance, Chad Kennedy and Derrick Atkins. This Public Input, along with other Public Inputs, was developed with the goal of improving usability and accuracy on requirements associated with DC circuits.

DC residential and commercial installations are emerging in the electrical infrastructure and are expected to be a growing alternative to the traditional AC utility fed building. Examples include the US DOE Grid-interactive Efficient Buildings project (Note 1), the Purdue University RENEWW house (Note 2), and a DC Microgrid community in Vermont (Note 3). These installations may involve buildings that are distributed entirely with DC, or with an AC/DC hybrid distribution.

Although DC electrical distribution topics are covered by the NEC, the focus of most residential and commercial installations and the Code has historically been AC power. Many requirements are written using AC terminology or referencing only AC technology, but without distinction as to whether the requirement is also applicable to DC circuits or installations. Usage of terms such as “2-wire” and “3-wire”, or listing AC only voltages as informative references without appropriate mandatory language or further clarification may not provide sufficient clarity as to whether a requirement applies to DC circuits. This may leave the AHJ and other users of the Code confused. This public input recommends that such requirements be reviewed and clarified using the recommended terminology proposed.

Note 1 - https://www.energy.gov/sites/default/files/2020/09/f79/bto-geb-project-summary-093020.pdf
Note 2 - https://engineering.purdue.edu/ME/News/2022/purdue-house-runs-entirely-on-dc-power
Note 3 - https://www.efficiencyvermont.com/Media/Default/docs/white-papers/Energy_Resilience.pdf

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Public Input No. 2427-NFPA 70-2023 [Global Input]

See Attached File - Which Includes multiple related changes, all under the purview of CMP 12.

Additional Proposed Changes

File Name	Description	Approved
PI_For_CMP_12_Voltage_Demarcation_.docx	Global PI for CMP 12 (Consistent Voltage Demarcation)	

Statement of Problem and Substantiation for Public Input

This Public Input is submitted on behalf of a Correlating Committee Task Group consisting of Robert Osborne (Chair), Paul Barnhart, Lou Grahor, Donny Cook, Scott Higgins, Mike Querry, Roger McDaniel, Dave Burns, Rod Belisle, Kevin Rogers, Tony Ricciuti, Paul Knapp, Paul Sullivan, George Smith, Eric Simmon, Kevin Arnold, Larry Wildermuth, and Kyle Krueger.

Changes related to the voltage demarcation have been grouped to assist the CMP with review and resolution, with each change, and it's corresponding substantiation, noted in the table below: (table provided in attachment)

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Changes related to the voltage demarcation have been grouped to assist the CMP with review and resolution, with each change, and it's corresponding substantiation, noted in the table below:

Reference	Suggested Revision	Substantiation
625.4	**Voltages.** Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, 600, or 1000 volts or dc system input voltages of up to ~~1000~~ 1500 volts shall…	Requirements are revised to include the same voltage demarcation used in many places throughout the Code. This is also consistent with the product standards associated with EV charging.
646.20(B)	**Note: this IN seems unnecessary – delete rather than modify.** **Other Circuits.** Any areas of ITE that require servicing of parts that are greater … ~~Informational Note No. 2:~~ ~~It is assumed that ITE operates at voltages not exceeding 1000 volts.~~	The informational note is unnecessary and should be deleted.
660.4(C)	**Over 1000 Volts ac, 1500 Volts dc, Nominal**. Circuits and equipment operated at more than 1000 volts ac, 1500 volts dc, nominal, shall comply with Article 495~~490~~.	Requirements are revised to include the same voltage demarcation used in many places throughout the Code. In addition, reference to Article 490 is corrected to reflect "495".

Public Input No. 719-NFPA 70-2023 [Definition: Electric Vehicle (EV).]

Electric Vehicle (EV).

An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and electric motorcycles, primarily powered by an electric motor that draws current from a ~~rechargeable~~ storage battery ~~, fuel~~ recharged from the mains, mains-connected fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are electric vehicles having a second source of motive power. Regular hybrid electric vehicles (HEV) and fuel cell electric vehicles (FCEV) without a plug to the mains are not considered electric vehicles for this *Code* because they cannot be recharged from the mains. Regular HEVs are powered exclusively by an internal combustion engine, using the electric motor just to reuse the energy captured during regenerative braking. (CMP-12)

Informational Note: Off-road, self-propelled electric mobile machines, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, and boats are not considered electric vehicles.

Statement of Problem and Substantiation for Public Input

Clarified that non-plug-in HEVs and non-plug-in FCEVs are not considered EVs for the purpose of this Code because they cannot connect to the electrical utility grid.

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Public Input No. 2580-NFPA 70-2023 [Definition: Electric Vehicle Power Export Equipment (EVPE).]

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the electric vehicle, that is used to provide electrical power at voltages greater than or equal to 30 Vac or 60 Vdc to loads external to the electric vehicle, using the electric vehicle as the source of supply. (625) (CMP-12)

Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment or wireless power transfer equipment are sometimes contained in one piece of equipment, sometimes referred to as a bidirectional electric vehicle supply equipment (EVSE) or bidirectional wireless power transfer equipment (WPTE).

Statement of Problem and Substantiation for Public Input

This public input seeks to add clarity to the definition to ensure that it is clear that this definition pertains to only an electric vehicle and not any vehicle. the term "vehicle" alone applies to many different types of outside of an electric vehicle which is a defined term.

Submitter Information Verification

Submitter Full Name: Thomas Domitrovich
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City:
State:
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Submittal Date: Tue Aug 22 19:39:22 EDT 2023
Committee: NEC-P12

Public Input No. 2460-NFPA 70-2023 [Definition: Fastened-in-Place.]

Fastened-in-Place.

Mounting means of equipment in which the fastening means are specifically designed to permit removal without the use of a tool. (~~625) (~~ CMP-~~12~~ 1)

Statement of Problem and Substantiation for Public Input

The term ‘fastened in place’ is used 70 times in the Code. This definition is a very common word that should apply in general and not just to Article 625 requirements. This definition should also fall under the purview of CMP-1. The proposed revisions will enhance usability throughout the NEC.

Submitter Information Verification

Submitter Full Name: Mike Holt
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Submittal Date: Thu Aug 17 13:22:04 EDT 2023
Committee: NEC-P12

Public Input No. 4230-NFPA 70-2023 [Definition: Fastened-in-Place.]

Fastened-in-Place.

Mounting means of equipment in which the fastening means are specifically designed to permit removal without the use of a tool._ (~~625) (~~ CMP-12)

Statement of Problem and Substantiation for Public Input

Delete the reference to Article (625) from the definition. Code readers need a definition of “Fastened-in-Place” that can be used in more than just Article 625 applications. The term “Fastened-in-Place” is used throughout the code, not just in Article 625.
I am also submitting similar public inputs for the definitions of "Fixed", "Fixed-in-Place, and "Stationary".

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4228-NFPA 70-2023 [Definition: Stationary (as applied to equipment).]	
Public Input No. 4229-NFPA 70-2023 [Definition: Fixed (as applied to equipment).]	
Public Input No. 4231-NFPA 70-2023 [Definition: Fixed-in-Place.]	
Public Input No. 4228-NFPA 70-2023 [Definition: Stationary (as applied to equipment).]	
Public Input No. 4229-NFPA 70-2023 [Definition: Fixed (as applied to equipment).]	
Public Input No. 4231-NFPA 70-2023 [Definition: Fixed-in-Place.]	

Submitter Information Verification

Submitter Full Name: Jeffrey Simpson
Organization: ElectricalLicenseRenewal.com
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 02:13:09 EDT 2023
Committee: NEC-P12

Public Input No. 759-NFPA 70-2023 [Definition: Fastened-in-Place.]

Fastened-in-Place.

Mounting means of equipment in which the fastening means are specifically designed to permit removal without the use of ~~a tool~~ a tool specific to particular industries . (625) (CMP-12)

Statement of Problem and Substantiation for Public Input

Most wall-mounted EVSEs that are cord-and-plug connected are mounted directly to the wall via screws. Removing screws obviously requires the use of a tool, though regular household tools do the job. Under the previous wording, those EVSEs (standard practice) are not NEC compliant because they are considered fixed-in-place, and 625.44(c) requires all fixed-in-place EVSE to be permanently wired (i.e., hardwired). That was clearly not the intent of the NEC because they were intended to be considered fastened-in-place.

New wording makes it clear that those fall under the definition of fastened-in-place because they do not require specialized tools (only requiring tools standard among the general public) to be unmounted from the wall. Only the wall-mounted EVSEs (very few) that latched or slid onto a mounting frame which in turn screwed onto the wall met the former definition of fastened-in-place.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
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Zip:
Submittal Date: Tue May 02 00:41:36 EDT 2023
Committee: NEC-P12

Public Input No. 4231-NFPA 70-2023 [Definition: Fixed-in-Place.]

Fixed-in-Place.

Mounting means of equipment using fasteners that require a tool for removal._ (~~625) (~~ CMP-12)

Statement of Problem and Substantiation for Public Input

Delete the reference to Article (625) from the definition. Code readers need a definition of “Fixed-in-Place” that can be used in more than just Article 625 applications. The term “Fixed-in-Place” is used throughout the code, not just in Article 625.
I am also submitting similar public inputs for the definitions of "Fastened-in-Place, "Stationary", and "Fixed".

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4228-NFPA 70-2023 [Definition: Stationary (as applied to equipment).]	
Public Input No. 4229-NFPA 70-2023 [Definition: Fixed (as applied to equipment).]	
Public Input No. 4230-NFPA 70-2023 [Definition: Fastened-in-Place.]	
Public Input No. 4228-NFPA 70-2023 [Definition: Stationary (as applied to equipment).]	
Public Input No. 4229-NFPA 70-2023 [Definition: Fixed (as applied to equipment).]	
Public Input No. 4230-NFPA 70-2023 [Definition: Fastened-in-Place.]	

Submitter Information Verification

Submitter Full Name: Jeffrey Simpson
Organization: ElectricalLicenseRenewal.com
Street Address:
City:
State:
Zip:
Submittal Date: Thu Sep 07 02:18:23 EDT 2023
Committee: NEC-P12

Public Input No. 4047-NFPA 70-2023 [Definition: Information Technology Equipment (ITE).]

Information Technology Equipment (ITE).

Equipment and systems rated 1000 volts or less, normally found in offices or other business establishments and similar environments classified as ordinary locations, that are used for creation and manipulation of data, voice, video, and similar signals~~ that are not communications equipment and do not process communications circuits~~ . (CMP-12)

Informational Note: See UL 60950-1, *Information Technology Equipment — Safety — Part 1: General Requirements*, or UL 62368-1, *Audio/Video Information and Communication Technology Equipment Part 1: Safety Requirements*, for information on listing requirements for both information technology equipment and communications equipment.

Statement of Problem and Substantiation for Public Input

This PI clarifies that ITE to be ITE and removes the potential for inference by the reader that there are differing requirements based specific usage (e.g., communications/non-communications applications).

Submitter Information Verification

Submitter Full Name: Jeff Silveira
Organization: Bicsi
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City:
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Submittal Date: Wed Sep 06 14:55:36 EDT 2023
Committee: NEC-P12

Public Input No. 4292-NFPA 70-2023 [Definition: Information Technology Equipment (ITE).]

Information Technology Equipment (ITE).

Equipment and systems rated 1000 volts or less, normally found in offices or other business establishments and similar environments classified as ordinary locations, that are used for creation and manipulation of data, voice, video, and similar signals ~~that are not communications equipment and do not process communications circuits~~ . (CMP-12)

Informational Note: See UL 60950-1, *Information Technology Equipment — Safety — Part 1: General Requirements*, or UL 62368-1, *Audio/Video Information and Communication Technology Equipment Part 1: Safety Requirements*, for information on listing requirements for both information technology equipment and communications equipment.

Statement of Problem and Substantiation for Public Input

This PI clarifies that ITE to be ITE and remove the potential inference by the reader that there are differing requirements based specific usage (e.g., communications/non-communications applications).

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
Organization: CableSafe, Inc./OFS
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Zip:
Submittal Date: Thu Sep 07 09:34:02 EDT 2023
Committee: NEC-P12

Public Input No. 3886-NFPA 70-2023 [Definition: Information Technology Equipment Room.]

Information Technology Equipment Room.

A room within the information technology equipment area that contains the information technology equipment. [**75:**3.3.15] (CMP-12)

Ingress Illumination. A lighting system that automatically illuminates pathways to the areas around electrical service equipment greater than 200 amperes for a duration of not less than 90 minutes for the purpose of rescue.

Statement of Problem and Substantiation for Public Input

This definition will pair with a proposal submitted to the committee writing Article 700. When a power failure is the result of an accident at the service, a pathway for the rescue team is necessary to support the purpose of the NEC We should not assume that the pathway OUT of a building for occupants is the same pathway INTO a building that a rescue team needs to get to the electric service equipment.

Responses to this proposal in past revision cycles refer to building codes and NFPA 101. Sections 1008 (Means of Egress Illumination) and Section 1009 (Accessible Means of Egress) of the ICC's International Building Code do not contemplate the condition in which a power failure caused the outage to begin with and that there would be no illumination for worker rescue.

NFPA 101 refers to the IBC which effectively creates a do-nothing loop which should be remedied in an NEC section that sets general rules for electrical safety.

Electrical professionals should not rely upon the International Building Code to assure adequate illumination to rescue a fallen electrician.

Submitter Information Verification

Submitter Full Name: Michael Anthony
Organization: Standards Michigan LLC
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City:
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Zip:
Submittal Date: Wed Sep 06 09:09:42 EDT 2023
Committee: NEC-P12

Public Input No. 4262-NFPA 70-2023 [Definition: Load Management.]

Load Management.

The process within an energy management system that limits the total electrical load on an electrical supply system to a set value by adjusting or controlling the individual loads. (~~625~~ 750) (CMP-~~12~~ 13)

Informational Note: Load management is sometimes called *demand-side management* (DSM).

Statement of Problem and Substantiation for Public Input

Article 625.42(A) refers to the use of Load Management in accordance with Article 750.30(C). Requirements related to Load Management are outlined in 750.30, not 625.42. Therefore, it is more appropriate for the definition of this term to be under the purview of CMP-13.

Submitter Information Verification

Submitter Full Name: Curtis Flint
Organization: Generac Power Systems, Inc.
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City:
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Zip:
Submittal Date: Thu Sep 07 08:42:36 EDT 2023
Committee: NEC-P12

Public Input No. 4295-NFPA 70-2023 [Definition: Load Management.]

Load Management.

The process within an energy management system that limits the total electrical load on an electrical supply system to a set value by adjusting or controlling the individual loads. (~~625~~) (CMP-~~12~~ 13)

~~Informational Note: Load management is sometimes called *demand-side management* (DSM).~~

Statement of Problem and Substantiation for Public Input

This public input is part of a series of changes submitted on behalf of a task group appointed by the NEC Correlating Committee. This task group was appointed to clarify the requirements for energy management systems that include controls to prevent the overload of conductors and equipment. The members of the task group are Derrick Atkins, Greg Ball, Doug Burket, Mark Cook, Jason Fisher, Matthew Grover, Rebekah Hren, Pete Jackson, Robert Jordan, Robert Osborne, Charles Picard, Laura Stevens, Tim Windey, Timothy Zgonena.

The definition of load management is revised to remove the specific application to Article 625 since the term is used in multiple articles. The informational note is removed since the application of load management is broader than demand side management and inclusion may cause confusion. The assignment of the definition to CMP 13 aligns with the other requirements for energy management systems.

Submitter Information Verification

Submitter Full Name: Chad Kennedy
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City:
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Submittal Date: Thu Sep 07 10:07:39 EDT 2023
Committee: NEC-P12

Public Input No. 1844-NFPA 70-2023 [Definition: Maximum Output Power.]

Maximum Output Power. (as applied to audio signal processing, amplification, and reproduction equipment)

The maximum power delivered by an amplifier into its rated load as determined under specified test conditions. (640) (CMP-12)

Informational Note: The maximum output power can exceed the manufacturer's rated output power for the same amplifier.

Statement of Problem and Substantiation for Public Input

Duplicate definition. A definition that is duplicated and applied to only one article should add clarification in the term to aid the user in selecting the appropriate definition.

Submitter Information Verification

Submitter Full Name: IEC National
Organization: IEC
Affiliation: Ed Brown IEC
Street Address:
City:
State:
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Submittal Date: Sun Aug 06 14:05:49 EDT 2023
Committee: NEC-P12

Public Input No. 3034-NFPA 70-2023 [Definition: Maximum Output Power.]

Maximum Output Power.

The maximum power delivered ~~by an amplifier into~~ at its rated load as determined under specified test conditions. ~~(640) (CMP-12)~~

~~Informational Note: The maximum output power can exceed the manufacturer's rated output power for the same amplifier.~~

Statement of Problem and Substantiation for Public Input

This definition was revised to comply with the NEC Style Manual Section 2.1.2.7 regarding multiple definitions for the same term.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
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City:
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Submittal Date: Tue Aug 29 07:15:08 EDT 2023
Committee: NEC-P12

Public Input No. 1846-NFPA 70-2023 [Definition: Portable.]

Portable. (as applied to electric vehicle power transfer systems)

A device intended for indoor or outdoor use that is designed to be hand-carried from location to location, or easily transported without the use of other devices or equipment. (625) (CMP-12)

Statement of Problem and Substantiation for Public Input

Duplicate definition. A definition that is duplicated and applied to only one article should add clarification in the term to aid the user in selecting the appropriate definition.

Submitter Information Verification

Submitter Full Name: IEC National
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Street Address:
City:
State:
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Submittal Date: Sun Aug 06 14:18:28 EDT 2023
Committee: NEC-P12

Public Input No. 1847-NFPA 70-2023 [Definition: Portable.]

Portable. (as applied to x-ray equipment)

X-ray equipment designed to be hand-carried. (660) (CMP-12)

Statement of Problem and Substantiation for Public Input

Duplicate definition. A definition that is duplicated and applied to only one article should add clarification in the term to aid the user in selecting the appropriate definition.

Submitter Information Verification

Submitter Full Name: IEC National
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Street Address:
City:
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Submittal Date: Sun Aug 06 14:20:49 EDT 2023
Committee: NEC-P12

Public Input No. 335-NFPA 70-2023 [Definition: Portable.]

~~**Portable.**~~ **Handheld**

X-ray equipment designed to be ~~hand-carried.~~ moved without the use of additional equipment (660) (CMP-12)

Statement of Problem and Substantiation for Public Input

To many uses of the term "portable". Minimize the use of the term "portable"

Submitter Information Verification

Submitter Full Name: Dennis Querry
Organization: Trinity River Authority
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City:
State:
Zip:
Submittal Date: Tue Feb 14 21:24:07 EST 2023
Committee: NEC-P12

Public Input No. 3992-NFPA 70-2023 [Definition: Portable.]

Portable.

A device intended for indoor or outdoor use that is designed to be hand-carried from location to location, or easily transported without the use of other devices or equipment. (~~625) (~~ CMP-~~12~~ 1)

Statement of Problem and Substantiation for Public Input

The definition of portable applies to multiple types of equipment. This PI puts the definition under the purview of CMP 1 for application throughout the code. This relates to several other PI's proposing removing additional definitions of portable.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3993-NFPA 70-2023 [Definition: Portable.]	
Public Input No. 3994-NFPA 70-2023 [Definition: Portable (as applied to equipment).]	
Public Input No. 3993-NFPA 70-2023 [Definition: Portable.]	
Public Input No. 3994-NFPA 70-2023 [Definition: Portable (as applied to equipment).]	

Submitter Information Verification

Submitter Full Name: Matthew Grover
Organization: Kings Electric Services
Street Address:
City:
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Zip:
Submittal Date: Wed Sep 06 12:50:34 EDT 2023
Committee: NEC-P12

Public Input No. 3993-NFPA 70-2023 [Definition: Portable.]

~~**Portable.**~~

~~X-ray equipment designed to be hand-carried. (660) (CMP-12)~~

Statement of Problem and Substantiation for Public Input

The definition of portable is sufficiently broad to cover portable x-ray equipment. Eliminating this definition streamlines definitions for the code user.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3992-NFPA 70-2023 [Definition: Portable.]	
Public Input No. 3992-NFPA 70-2023 [Definition: Portable.]	

Submitter Information Verification

Submitter Full Name: Matthew Grover
Organization: Kings Electric Services
Street Address:
City:
State:
Zip:
Submittal Date: Wed Sep 06 12:53:14 EDT 2023
Committee: NEC-P12

Public Input No. 992-NFPA 70-2023 [Definition: Truck Flanged Surface Inlet.]

Truck Flanged Surface Inlet.

The device(s) on the truck into which the connector(s) is inserted to provide electric energy and other services. This device is part of the truck coupler. ~~For the purposes of this article, the~~ The truck flanged surface inlet is considered to be part of the truck and not part of the electrified truck parking space supply equipment. (626) (CMP-12)

Statement of Problem and Substantiation for Public Input

With the revision of the Style Manual last cycle, all definitions were moved to article 100 of the Code. As such, this introductory clause no longer makes any sense and it is proposed to be deleted. The definition here is clearly tied to apply to Article 626 only, as indicated by the article number in parentheses at the end of the Definition, so this should be clear to the user.

Submitter Information Verification

Submitter Full Name: Richard Holub
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City:
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Submittal Date: Thu Jun 08 12:55:59 EDT 2023
Committee: NEC-P12

Public Input No. 3887-NFPA 70-2023 [New Definition after Definition: Electric Power Production ...]

Electric Self-Propelled Vehicle Supply Equipment (ESVSE)

Equipment for plug-in charging, including the ungrounded, grounded, and equipment grounding conductors, and the electric self-propelled vehicle connectors, attachment plugs, personnel protection system, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle. (625) (CMP-12)

Informational Note: Electric self-propelled vehicle power export equipment and electric self-propelled vehicle supply equipment or wireless power transfer equipment (WPTE) are sometimes contained in one piece of equipment, sometimes referred to as a bidirectional ESVSE or bidirectional WPTE.

Additional Proposed Changes

File Name	Description	Approved
100_ESVSE.docx	one of the terms	
Article_627_Electric_Self-Propelled_Vehicle_Power_Transfer_System_Rev1.docx	Related new article	

Statement of Problem and Substantiation for Public Input

This public input is a companion to the public input that creates the defined term “Electric Self-Propelled Vehicle.” This public input recognizes that the existing definition of “electric vehicle” and all associated terms such as electric vehicle supply equipment (EVSE) and electric vehicle power export equipment (EVPE) and the use of these terms in the NEC is limited only to automotive-type vehicles that are used on-road and does not recognize the many other electric vehicles that the NEC should be addressing. These other electric vehicles include but are not limited to electric forklifts, electric ground support equipment found at airports, electric tractor and other similar construction equipment, golf carts, and electric boats and electric ferries. This definition uses the term “Self-Propelled Vehicle” as that term is already used in the informational note to the defined terms “electric vehicle” and “garage” and provides a more generic approach to categorize the many other types of electric vehicles.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3899-NFPA 70-2023 [New Article after 625]	

Submitter Information Verification

Submitter Full Name: Thomas Domitrovich
Organization: Eaton Corporation

Street Address:	
City:	
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Zip:	
Submittal Date:	Wed Sep 06 09:12:29 EDT 2023
Committee:	NEC-P12

Article 100:

Electric Self-Propelled Vehicle Supply Equipment (ESVSE)

Equipment for plug-in charging, including the ungrounded, grounded, and equipment grounding conductors, and the electric self-propelled vehicle connectors, attachment plugs, personnel protection system, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle. (625) (CMP-12)

Informational Note: Electric self-propelled vehicle power export equipment and electric self-propelled vehicle supply equipment or wireless power transfer equipment (WPTE) are sometimes contained in one piece of equipment, sometimes referred to as a bidirectional ESVSE or bidirectional WPTE.

Substantiation:

This public input is a companion to the public input that creates the defined term "Electric Self-Propelled Vehicle." This public input recognizes that the existing definition of "electric vehicle" and all associated terms such as electric vehicle supply equipment (EVSE) and electric vehicle power export equipment (EVPE) and the use of these terms in the NEC is limited only to automotive-type vehicles that are used on-road and does not recognize the many other electric vehicles that the NEC should be addressing. These other electric vehicles include but are not limited to electric forklifts, electric ground support equipment found at airports, electric tractor and other similar construction equipment, golf carts, and electric boats and electric ferries. This definition uses the term "Self-Propelled Vehicle" as that term is already used in the informational note to the defined terms "electric vehicle" and "garage" and provides a more generic approach to categorize the many other types of electric vehicles.

Article 627 Electric Self-Propelled Vehicle Power Transfer System

Part I. General

627.1 Scope.

This article covers the electrical conductors and equipment connecting an electric self-propelled vehicle (ESV) to premises wiring for the purposes of charging, power export, or bidirectional current flow.

627.4 Voltages.

Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, 600, or 1000 volts or dc system input voltages of up to 1000 volts shall be used to supply equipment covered by this article. Output voltages to the ESV are not specified.

627.6 Listed.

Electric Self-Propelled Vehicle Supply Equipment (ESVSE) including power supply cords for the purposes of charging, power export, or bidirectional current flow shall be listed.

Part II. Equipment Construction

627.17 Cords and Cables.

(A) Power-Supply Cord.

The cable for cord-connected ESVSE shall comply with all of the following:

(1) Be any of the types specified in 627.17(B)(1) or hard service cord, junior hard service cord, or portable power cable types in accordance with Table 400.4. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2).

(3) Have an overall length as specified in either of the following:

a. When the interrupting device of the personnel protection system specified in 627.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

(i) For portable equipment in accordance with 627.44(A), the power-supply cord shall be not more than 300 mm (12 in.) long.

(ii) For fastened-in-place equipment in accordance with 627.44(B), the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

b. When the interrupting device of the personnel protection system specified in 627.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

(B) Output Cable to ESV.
The output cable to an ESV shall be one of the following:

(1) Listed Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4

(2) An integral part of listed ESVSE.

(C) Overall Cord and Cable Length.
The overall usable length shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is part of the listed ESVSE.

(1) Portable Equipment.

For portable ESVSE, the cord-exposed usable length shall be measured from the face of the attachment plug to the face of the ESV connector.

(2) Fastened-in-Place.
Where the ESVSE is fastened-in-place, the usable length of the output cable to the ESV shall be measured from the cable exit of the ESVSE to the face of the ESV connector.

Where wireless power transfer equipment (WPTE) is fastened-in-place, the output cable to the primary pad shall be measured from the cable exit of the control box to the cable inlet at the primary pad.

(D) Interconnecting Cabling Systems.
Other cabling systems that are integral parts of listed supply equipment and are intended to interconnect pieces of equipment within an ESVSE system using approved installation methods shall be permitted.

627.22 Personnel Protection System.
ESVSE shall have a listed system of protection against electric shock of personnel. Where cord-and-plug-connected equipment is used, the interrupting device of a listed personnel protection system shall be provided according to 627.17(A). A personnel protection system shall not be required for power transfer equipment that supplies less than 60 volts dc.

Part III. Installation

627.40 ESVSE Branch Circuit.
Each outlet installed for the purpose of supplying ESVSE supply equipment greater than 16 amperes, or 120 volts shall be supplied by an individual branch circuit.

Exception: Branch circuits shall be permitted to feed multiple ESVSE as permitted by 627.42(A) or (B).

627.41 Overcurrent Protection.
Overcurrent protection for feeders and branch circuits supplying ESVSE and WPTE, including bidirectional equipment, shall be sized for continuous duty and shall have

a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

627.42 Rating.

The ESVSE shall have sufficient rating to supply the load served. Charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 627.42(A) or (B).

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load management of ESVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) Supply Equipment with Adjustable Settings.

Supply equipment with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer’s instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. Supply equipment as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

627.43 Disconnecting Means.

For supply equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

627.44 Equipment Connection.
ESVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 627.44(A) through (C).

(A) Portable Equipment.
Portable equipment shall be connected to the premises wiring system by one or more of the following methods:
(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes
(2) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes
(3) A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes
(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(B) Fastened-in-Place Equipment.
Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes
(2) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes
(3) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes
(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

(C) Fixed-in-Place Equipment.
All other ESVSE and WPTE shall be permanently wired and fixed-in-place to the supporting surface.

627.46 Loss of Primary Source.
Means shall be provided such that, upon loss of voltage from the utility or other electrical system(s), energy cannot be back fed through the ESV and the supply equipment to the premises wiring system unless permitted by 627.48.

627.47 Multiple Feeder or Branch Circuits.
Where equipment is identified for the application, more than one feeder or branch circuit shall be permitted to supply equipment.

627.48 Interactive Equipment.
ESVSE or WPTE that incorporates a power export function and that is part of an interactive system that serves as an optional standby system, an electric power production source, or a bidirectional power feed shall be listed and marked as suitable for that purpose. When used as an optional standby system, the requirements of Parts I and II of Article 702 shall apply; when used as an electric power production source, the requirements of Parts I and II of Article 705 shall apply. EVPE that provides a receptacle outlet as its point of power export shall be in accordance with 627.60.

627.49 Island Mode.
ESVPE and bidirectional ESVSE that incorporate a power export function shall be permitted to be a part of an interconnected power system operating in island mode.

627.50 Location.
The ESVSE shall be located for direct electrical coupling of the ESV connector (conductive or inductive) to the ESV. Unless specifically listed and marked for the location, the coupling means of the ESV shall be stored or located at a height of not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above the grade level for outdoor locations. This requirement does not apply to portable ESVSE constructed in accordance with 627.44(A).

627.52 Ventilation.
The ventilation requirement for charging an ESV in an indoor enclosed space shall be determined by 627.52(A) or (B).

(A) Ventilation Not Required.
Where electric vehicle storage batteries are used or where the equipment is listed for charging electric vehicles indoors without ventilation, mechanical ventilation shall not be required.

(B) Ventilation Required.
Where the equipment is listed for charging electric vehicles that require ventilation for indoor charging, mechanical ventilation, such as a fan, shall be provided. The ventilation shall include both supply and exhaust equipment and shall be permanently installed and located to intake from, and vent directly to, the outdoors. Positive-pressure ventilation systems shall be permitted only in vehicle charging buildings or areas that have been specifically designed and approved for that application. Mechanical ventilation requirements shall be determined by one of the methods specified in 627.52(B)(1) through (B)(4).

(1) Table Values.
For supply voltages and currents specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be as specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2) for each of the total number of electric vehicles that can be charged at one time.

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each of the Total Number of ESVs That Can Be Charged at One Time

	Branch-Circuit Voltage							
Branch-Circuit Ampere Rating	DC ≥ 50 V	Single Phase 120 V	Single Phase 208 V	Single Phase 240 V or 120/240 V	3 Phase 208 V or 208Y/120 V	3 Phase 240 V	3 Phase 480 V or 480Y/277 V	3 Phase 600 V or 600Y/347 V
15	0.5	1.1	1.8	2.1	—	—	—	—
20	0.6	1.4	2.4	2.8	4.2	4.8	9.7	12
30	0.9	2.1	3.6	4.2	6.3	7.2	15	18
40	1.2	2.8	4.8	5.6	8.4	9.7	19	24
50	1.5	3.5	6.1	7.0	10	12	24	30
60	1.8	4.2	7.3	8.4	13	15	29	36
100	2.9	7.0	12	14	21	24	48	60
150	—	—	—	—	31	36	73	91
200	—	—	—	—	42	48	97	120

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each of the Total Number of ESVs That Can Be Charged at One Time

	Branch-Circuit Voltage							
Branch-		Single Phase			3 Phase			
Circuit Ampere Rating	DC ≥ 50 V	120 V	208 V	240 V or 120/240 V	208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
250	—	—	—	—	52	60	120	150
300	—	—	—	—	63	73	145	180
350	—	—	—	—	73	85	170	210
400	—	—	—	—	84	97	195	240

Table 627.52(B)(1)(2) Minimum Ventilation Required in Cubic Feet per Minute (cfm) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

	Branch-Circuit Voltage							
Branch-		Single Phase			3 Phase			
Circuit Ampere Rating	DC ≥ 50V	120 V	208 V	240 V or 120/240 V	208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
15	15.4	37	64	74	—	—	—	—
20	20.4	49	85	99	148	171	342	427
30	30.8	74	128	148	222	256	512	641
40	41.3	99	171	197	296	342	683	854
50	51.3	123	214	246	370	427	854	1066
60	61.7	148	256	296	444	512	1025	1281
100	102.5	246	427	493	740	854	1708	2135
150	—	—	—	—	1110	1281	2562	3203
200	—	—	—	—	1480	1708	3416	4270
250	—	—	—	—	1850	2135	4270	5338
300	—	—	—	—	2221	2562	5125	6406
350	—	—	—	—	2591	2989	5979	7473
400	—	—	—	—	2961	3416	6832	8541

(2) Other Values.

For supply voltages and currents other than specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be calculated by means of the following general formulas, as applicable:

(1) Single-phase ac or dc:

$$Ventilation\ single-phase\ ac\ or\ dc\ in\ cubic\ meters\ per\ minute\ \left(\frac{m^3}{min}\right) = \frac{(volts)(amperes)}{1718}$$ [627.52(B)(2)a]

$$Ventilation\ single-phase\ ac\ or\ dc\ in\ cubic\ feet\ per\ minute\ (cfm) = \frac{(volts)(amperes)}{48.7}$$ [627.52(B)(2)b]

(2) Three-phase ac:

$$Ventilation\ 3-phase\ ac\ or\ dc\ in\ cubic\ meters\ per\ minute\ \left(\frac{m^3}{min}\right) = \frac{(1.732)(volts)(amperes)}{1718}$$ [627.52(B)(2)c]

$$Ventilation\ 3-phase\ ac\ or\ dc\ in\ cubic\ feet\ per\ minute\ (cfm) = \frac{(1.732)(volts)(amperes)}{48.7}$$ [627.52(B)(2)d]

(3) Engineered Systems.
For an equipment ventilation system designed by a person qualified to perform such calculations as an integral part of a building's total ventilation system, the minimum ventilation requirements shall be permitted to be determined in accordance with calculations specified in the engineering study.

(4) Supply Circuits.
The supply circuit to the mechanical ventilation equipment shall be electrically interlocked with the equipment and shall remain energized during the entire electric vehicle charging cycle. Equipment receptacles rated at 125 volts, single phase, 15 and 20 amperes shall be switched, and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the receptacle. Equipment supplied from less than 50 volts dc shall be switched and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the equipment.

627.54 Ground-Fault Circuit-Interrupter Protection for Personnel.
All receptacles installed for the connection of ESVSE shall have ground-fault circuit-interrupter protection for personnel.

627.56 Receptacle Enclosures.
All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed. An outlet box hood installed for this purpose shall be listed and shall be identified as extra duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood shall not be required to be marked extra duty.

Part IV. Wireless Power Transfer Equipment

627.101 Grounding.
The primary pad base plate shall be of a nonferrous metal and shall be connected to the circuit equipment grounding conductor unless the listed WPTE employs a double-insulation system. The base plate shall be sized to match the size of the primary pad enclosure.

627.102 Installation.

(A) General.
The control pad, if included in the WPTE configuration, shall comply with 627.102(B). The primary pad shall comply with 627.102(C).

(B) Control Box.
The control box enclosure shall be suitable for the environment and shall be mounted at a height not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above grade level for outdoor locations. The control box shall be mounted in one of the following forms:

(1) Pedestal
(2) Wall or pole
(3) Building or structure
(4) Raised concrete pad

(C) Primary Pad.
The primary pad shall be installed secured to the surface or embedded in the surface of the floor with its top flush with the surface or below the surface, all per manufacturer's instructions and the following:

(1) If the primary pad is located in an area requiring snow removal, it shall not be located on or above the surface.

Exception: Where installed on private property where snow removal is done manually, the primary pad shall be permitted to be installed on or above the surface.

(2) The primary pad enclosure shall be suitable for the environment. If the primary pad is located in an area subject to severe climatic conditions (e.g., flooding), the enclosure shall be suitably rated for those conditions.

(D) Protection of Cords and Cables to the Primary Pad.
The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. If installed in conditions where drive-over could occur, the cable shall be provided with supplemental protection.

Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points. Where subject to vehicular traffic, supplemental protection shall be provided.

(E) Other Wiring Systems.
Other wiring systems and fittings specifically listed for use on the WPTE shall be permitted.

Public Input No. 3893-NFPA 70-2023 [New Definition after Definition: Electric Power Production ...]

Electric Self-Propelled Vehicle Power Export Equipment (ESVPE)

The equipment, including the outlet on the electric self-propelled vehicle (ESV), that is used to provide electrical power at voltages greater than or equal to 30 Vac or 60 Vdc to loads external to the ESV, using the vehicle as the source of supply. (625) (CMP-12)

Informational Note: Electric self-propelled vehicle power export equipment and electric self-propelled vehicle supply equipment or wireless power transfer equipment are sometimes contained in one piece of equipment, sometimes referred to as a bidirectional electric self-propelled vehicle supply equipment (ESVSE) or bidirectional wireless power transfer equipment (WPTE).

Additional Proposed Changes

File Name	Description	Approved
100_ESVPE.docx	Definition in word format	
Article_627_Electric_Self-Propelled_Vehicle_Power_Transfer_System_Rev1.docx	new Article related to this public input	

Statement of Problem and Substantiation for Public Input

This public input is a companion to the public input that creates the defined term “Electric Self-Propelled Vehicle.” This public input recognizes that the existing definition of “electric vehicle” and all associated terms such as electric vehicle supply equipment (EVSE) and electric vehicle power export equipment (EVPE) and the use of these terms in the NEC is limited only to automotive-type vehicles that are used on-road and does not recognize the many other electric vehicles that the NEC should be addressing. These other electric vehicles include but are not limited to electric forklifts, electric ground support equipment found at airports, electric tractor and other similar construction equipment, golf carts, and electric boats and electric ferries. This definition uses the term “Self-Propelled Vehicle” as that term is already used in the informational note to the defined terms “electric vehicle” and “garage” and provides a more generic approach to categorize the many other types of electric vehicles.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3899-NFPA 70-2023 [New Article after 625]	

Submitter Information Verification

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Committee:	NEC-P12

Article 100:

Electric Self-Propelled Vehicle Power Export Equipment (ESVPE)
The equipment, including the outlet on the electric self-propelled vehicle (ESV), that is used to provide electrical power at voltages greater than or equal to 30 Vac or 60 Vdc to loads external to the ESV, using the vehicle as the source of supply. (625) (CMP-12)

Informational Note: Electric self-propelled vehicle power export equipment and electric self-propelled vehicle supply equipment or wireless power transfer equipment are sometimes contained in one piece of equipment, sometimes referred to as a bidirectional electric self-propelled vehicle supply equipment (ESVSE) or bidirectional wireless power transfer equipment (WPTE).

Substantiation:
This public input is a companion to the public input that creates the defined term "Electric Self-Propelled Vehicle." This public input recognizes that the existing definition of "electric vehicle" and all associated terms such as electric vehicle supply equipment (EVSE) and electric vehicle power export equipment (EVPE) and the use of these terms in the NEC is limited only to automotive-type vehicles that are used on-road and does not recognize the many other electric vehicles that the NEC should be addressing. These other electric vehicles include but are not limited to electric forklifts, electric ground support equipment found at airports, electric tractor and other similar construction equipment, golf carts, and electric boats and electric ferries. This definition uses the term "Self-Propelled Vehicle" as that term is already used in the informational note to the defined terms "electric vehicle" and "garage" and provides a more generic approach to categorize the many other types of electric vehicles.

Article 627 Electric Self-Propelled Vehicle Power Transfer System

Part I. General

627.1 Scope.

This article covers the electrical conductors and equipment connecting an electric self-propelled vehicle (ESV) to premises wiring for the purposes of charging, power export, or bidirectional current flow.

627.4 Voltages.

Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, 600, or 1000 volts or dc system input voltages of up to 1000 volts shall be used to supply equipment covered by this article. Output voltages to the ESV are not specified.

627.6 Listed.

Electric Self-Propelled Vehicle Supply Equipment (ESVSE) including power supply cords for the purposes of charging, power export, or bidirectional current flow shall be listed.

Part II. Equipment Construction

627.17 Cords and Cables.

(A) Power-Supply Cord.

The cable for cord-connected ESVSE shall comply with all of the following:

(1) Be any of the types specified in 627.17(B)(1) or hard service cord, junior hard service cord, or portable power cable types in accordance with Table 400.4. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2).

(3) Have an overall length as specified in either of the following:

a. When the interrupting device of the personnel protection system specified in 627.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

(i) For portable equipment in accordance with 627.44(A), the power-supply cord shall be not more than 300 mm (12 in.) long.

(ii) For fastened-in-place equipment in accordance with 627.44(B), the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

b. When the interrupting device of the personnel protection system specified in 627.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

(B) Output Cable to ESV.
The output cable to an ESV shall be one of the following:

(1) Listed Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4

(2) An integral part of listed ESVSE.

(C) Overall Cord and Cable Length.
The overall usable length shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is part of the listed ESVSE.

(1) Portable Equipment.

For portable ESVSE, the cord-exposed usable length shall be measured from the face of the attachment plug to the face of the ESV connector.

(2) Fastened-in-Place.
Where the ESVSE is fastened-in-place, the usable length of the output cable to the ESV shall be measured from the cable exit of the ESVSE to the face of the ESV connector.

Where wireless power transfer equipment (WPTE) is fastened-in-place, the output cable to the primary pad shall be measured from the cable exit of the control box to the cable inlet at the primary pad.

(D) Interconnecting Cabling Systems.
Other cabling systems that are integral parts of listed supply equipment and are intended to interconnect pieces of equipment within an ESVSE system using approved installation methods shall be permitted.

627.22 Personnel Protection System.
ESVSE shall have a listed system of protection against electric shock of personnel. Where cord-and-plug-connected equipment is used, the interrupting device of a listed personnel protection system shall be provided according to 627.17(A). A personnel protection system shall not be required for power transfer equipment that supplies less than 60 volts dc.

Part III. Installation

627.40 ESVSE Branch Circuit.
Each outlet installed for the purpose of supplying ESVSE supply equipment greater than 16 amperes, or 120 volts shall be supplied by an individual branch circuit.

Exception: Branch circuits shall be permitted to feed multiple ESVSE as permitted by 627.42(A) or (B).

627.41 Overcurrent Protection.
Overcurrent protection for feeders and branch circuits supplying ESVSE and WPTE, including bidirectional equipment, shall be sized for continuous duty and shall have

a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

627.42 Rating.

The ESVSE shall have sufficient rating to supply the load served. Charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 627.42(A) or (B).

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load management of ESVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) Supply Equipment with Adjustable Settings.

Supply equipment with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer’s instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. Supply equipment as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

627.43 Disconnecting Means.

For supply equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

627.44 Equipment Connection.
ESVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 627.44(A) through (C).

(A) Portable Equipment.
Portable equipment shall be connected to the premises wiring system by one or more of the following methods:
(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes
(2) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes
(3) A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes
(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(B) Fastened-in-Place Equipment.
Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes
(2) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes
(3) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes
(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

(C) Fixed-in-Place Equipment.
All other ESVSE and WPTE shall be permanently wired and fixed-in-place to the supporting surface.

627.46 Loss of Primary Source.
Means shall be provided such that, upon loss of voltage from the utility or other electrical system(s), energy cannot be back fed through the ESV and the supply equipment to the premises wiring system unless permitted by 627.48.

627.47 Multiple Feeder or Branch Circuits.
Where equipment is identified for the application, more than one feeder or branch circuit shall be permitted to supply equipment.

627.48 Interactive Equipment.
ESVSE or WPTE that incorporates a power export function and that is part of an interactive system that serves as an optional standby system, an electric power production source, or a bidirectional power feed shall be listed and marked as suitable for that purpose. When used as an optional standby system, the requirements of Parts I and II of Article 702 shall apply; when used as an electric power production source, the requirements of Parts I and II of Article 705 shall apply. EVPE that provides a receptacle outlet as its point of power export shall be in accordance with 627.60.

627.49 Island Mode.
ESVPE and bidirectional ESVSE that incorporate a power export function shall be permitted to be a part of an interconnected power system operating in island mode.

627.50 Location.
The ESVSE shall be located for direct electrical coupling of the ESV connector (conductive or inductive) to the ESV. Unless specifically listed and marked for the location, the coupling means of the ESV shall be stored or located at a height of not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above the grade level for outdoor locations. This requirement does not apply to portable ESVSE constructed in accordance with 627.44(A).

627.52 Ventilation.
The ventilation requirement for charging an ESV in an indoor enclosed space shall be determined by 627.52(A) or (B).

(A) Ventilation Not Required.
Where electric vehicle storage batteries are used or where the equipment is listed for charging electric vehicles indoors without ventilation, mechanical ventilation shall not be required.

(B) Ventilation Required.
Where the equipment is listed for charging electric vehicles that require ventilation for indoor charging, mechanical ventilation, such as a fan, shall be provided. The ventilation shall include both supply and exhaust equipment and shall be permanently installed and located to intake from, and vent directly to, the outdoors. Positive-pressure ventilation systems shall be permitted only in vehicle charging buildings or areas that have been specifically designed and approved for that application. Mechanical ventilation requirements shall be determined by one of the methods specified in 627.52(B)(1) through (B)(4).

(1) Table Values.
For supply voltages and currents specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be as specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2) for each of the total number of electric vehicles that can be charged at one time.

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each of the Total Number of ESVs That Can Be Charged at One Time

	Branch-Circuit Voltage							
Branch-Circuit Ampere Rating	DC ≥ 50 V	Single Phase 120 V	Single Phase 208 V	Single Phase 240 V or 120/240 V	3 Phase 208 V or 208Y/120 V	3 Phase 240 V	3 Phase 480 V or 480Y/277 V	3 Phase 600 V or 600Y/347 V
15	0.5	1.1	1.8	2.1	—	—	—	—
20	0.6	1.4	2.4	2.8	4.2	4.8	9.7	12
30	0.9	2.1	3.6	4.2	6.3	7.2	15	18
40	1.2	2.8	4.8	5.6	8.4	9.7	19	24
50	1.5	3.5	6.1	7.0	10	12	24	30
60	1.8	4.2	7.3	8.4	13	15	29	36
100	2.9	7.0	12	14	21	24	48	60
150	—	—	—	—	31	36	73	91
200	—	—	—	—	42	48	97	120

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each of the Total Number of ESVs That Can Be Charged at One Time

	Branch-Circuit Voltage							
Branch-		Single Phase			3 Phase			
Circuit Ampere Rating	DC ≥ 50 V	120 V	208 V	240 V or 120/240 V	208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
250	—	—	—	—	52	60	120	150
300	—	—	—	—	63	73	145	180
350	—	—	—	—	73	85	170	210
400	—	—	—	—	84	97	195	240

Table 627.52(B)(1)(2) Minimum Ventilation Required in Cubic Feet per Minute (cfm) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

	Branch-Circuit Voltage							
Branch-		Single Phase			3 Phase			
Circuit Ampere Rating	DC ≥ 50V	120 V	208 V	240 V or 120/240 V	208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
15	15.4	37	64	74	—	—	—	—
20	20.4	49	85	99	148	171	342	427
30	30.8	74	128	148	222	256	512	641
40	41.3	99	171	197	296	342	683	854
50	51.3	123	214	246	370	427	854	1066
60	61.7	148	256	296	444	512	1025	1281
100	102.5	246	427	493	740	854	1708	2135
150	—	—	—	—	1110	1281	2562	3203
200	—	—	—	—	1480	1708	3416	4270
250	—	—	—	—	1850	2135	4270	5338
300	—	—	—	—	2221	2562	5125	6406
350	—	—	—	—	2591	2989	5979	7473
400	—	—	—	—	2961	3416	6832	8541

(2) Other Values.

For supply voltages and currents other than specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be calculated by means of the following general formulas, as applicable:

(1) Single-phase ac or dc:

$$Ventilation\ single-phase\ ac\ or\ dc\ in\ cubic\ meters\ per\ minute\ \left(\frac{m^3}{min}\right) = \frac{(volts)(amperes)}{1718}$$ [627.52(B)(2)a]

$$Ventilation\ single-phase\ ac\ or\ dc\ in\ cubic\ feet\ per\ minute\ (cfm) = \frac{(volts)(amperes)}{48.7}$$ [627.52(B)(2)b]

(2) Three-phase ac:

$$Ventilation\ 3-phase\ ac\ or\ dc\ in\ cubic\ meters\ per\ minute\ \left(\frac{m^3}{min}\right) = \frac{(1.732)(volts)(amperes)}{1718}$$ [627.52(B)(2)c]

$$Ventilation\ 3-phase\ ac\ or\ dc\ in\ cubic\ feet\ per\ minute\ (cfm) = \frac{(1.732)(volts)(amperes)}{48.7}$$ [627.52(B)(2)d]

(3) Engineered Systems.
For an equipment ventilation system designed by a person qualified to perform such calculations as an integral part of a building's total ventilation system, the minimum ventilation requirements shall be permitted to be determined in accordance with calculations specified in the engineering study.

(4) Supply Circuits.
The supply circuit to the mechanical ventilation equipment shall be electrically interlocked with the equipment and shall remain energized during the entire electric vehicle charging cycle. Equipment receptacles rated at 125 volts, single phase, 15 and 20 amperes shall be switched, and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the receptacle. Equipment supplied from less than 50 volts dc shall be switched and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the equipment.

627.54 Ground-Fault Circuit-Interrupter Protection for Personnel.
All receptacles installed for the connection of ESVSE shall have ground-fault circuit-interrupter protection for personnel.

627.56 Receptacle Enclosures.
All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed. An outlet box hood installed for this purpose shall be listed and shall be identified as extra duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood shall not be required to be marked extra duty.

Part IV. Wireless Power Transfer Equipment

627.101 Grounding.
The primary pad base plate shall be of a nonferrous metal and shall be connected to the circuit equipment grounding conductor unless the listed WPTE employs a double-insulation system. The base plate shall be sized to match the size of the primary pad enclosure.

627.102 Installation.

(A) General.
The control pad, if included in the WPTE configuration, shall comply with 627.102(B). The primary pad shall comply with 627.102(C).

(B) Control Box.
The control box enclosure shall be suitable for the environment and shall be mounted at a height not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above grade level for outdoor locations. The control box shall be mounted in one of the following forms:

(1) Pedestal
(2) Wall or pole
(3) Building or structure
(4) Raised concrete pad

(C) Primary Pad.
The primary pad shall be installed secured to the surface or embedded in the surface of the floor with its top flush with the surface or below the surface, all per manufacturer's instructions and the following:

(1) If the primary pad is located in an area requiring snow removal, it shall not be located on or above the surface.

Exception: Where installed on private property where snow removal is done manually, the primary pad shall be permitted to be installed on or above the surface.

(2) The primary pad enclosure shall be suitable for the environment. If the primary pad is located in an area subject to severe climatic conditions (e.g., flooding), the enclosure shall be suitably rated for those conditions.

(D) Protection of Cords and Cables to the Primary Pad.
The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. If installed in conditions where drive-over could occur, the cable shall be provided with supplemental protection.

Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points. Where subject to vehicular traffic, supplemental protection shall be provided.

(E) Other Wiring Systems.
Other wiring systems and fittings specifically listed for use on the WPTE shall be permitted.

Public Input No. 3894-NFPA 70-2023 [New Definition after Definition: Electric Power Production ...]

Electric Self-Propelled Vehicle (ESV)

A vehicle or marine vessel other than an electric vehicle such as farm equipment, boats and golf carts, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. (CMP-12)

Statement of Problem and Substantiation for Public Input

This public input recognizes that the existing definition of “electric vehicle” and the use of that term in the NEC is limited to automotive-type vehicles that are used on-road and does not recognize the many other electric vehicles that the NEC should be addressing. These other electric vehicles include but are not limited to: electric forklifts, electric ground support equipment found at airports, electric tractor and other similar construction equipment, golf carts, and electric boats and electric ferries. This definition uses the term “Self-Propelled Vehicle” as that term is already used in the informational note to the defined terms “electric vehicle” and “garage.”

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3899-NFPA 70-2023 [New Article after 625]	

Submitter Information Verification

Submitter Full Name: Thomas Domitrovich
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Submittal Date: Wed Sep 06 09:18:00 EDT 2023
Committee: NEC-P12

Public Input No. 2988-NFPA 70-2023 [Section No. 610.3]

610.3 Special Requirements for Particular Locations.

(A) Hazardous (Classified) Locations.

All equipment that operates in a hazardous (classified) location shall conform to ~~Article~~ ~~500~~ ~~.~~

~~**(1)** Class I Locations.~~

~~Equipment used in locations that are hazardous because of the presence of flammable gases or vapors shall conform to Article~~ ~~501~~ ~~.~~

~~**(2)** Class II Locations.~~

~~Equipment used in locations that are hazardous because of combustible dust shall conform to Article~~ ~~502~~ ~~.~~

~~**(3)** Class III Locations.~~

~~Equipment used in locations that are hazardous because of the presence of easily ignitible fibers or flyings shall conform to Article~~ ~~503~~ ~~.~~

~~(~~

the applicable hazardous location article requirements.

(B) Combustible Materials.

Where a crane, hoist, or monorail hoist operates over readily combustible material, the resistors shall be located as permitted in the following:

(1) A well ventilated cabinet composed of noncombustible material constructed so that it does not emit flames or molten metal

(2) A cage or cab constructed of noncombustible material that encloses the sides of the cage or cab from the floor to a point at least 150 mm (6 in.) above the top of the resistors

(C) Electrolytic Cell Lines.

See 668.32.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing the entire article except for Article 100 or where required for context. It is recommended that the charging sentence of (A) be revised to be more generic and point to the applicable hazardous location article as the current language makes no reference to Article 505 or 506 for Zone classified locations. The hazardous locations articles are not modified by this language, so 90.3 would apply as well in this case.

Submitter Information Verification

Submitter Full Name: Richard Holub
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Submittal Date: Mon Aug 28 14:33:58 EDT 2023

Committee: NEC-P12

Public Input No. 1520-NFPA 70-2023 [Section No. 610.42(A)]

(A) Fuse or Circuit Breaker Rating.

Crane, hoist, and monorail hoist motor branch circuits shall be protected by fuses or inverse-time circuit breakers that have a rating in accordance with ~~Table~~ 430.52~~(C)(1)~~ . Where two or more motors operate a single motion, the sum of their nameplate current ratings shall be considered as that of a single motor.

Statement of Problem and Substantiation for Public Input

By directly referring to the table, the user is directed to bypass the text of 430.52 which governs the use of this table. Furthermore, because of Note 2 in Table 430.52(C)(1), which does allow the modification per 430.52 for inverse time circuit breakers and not the other OCPDs in the table, this creates a disparity between the OCPDs and how they are calculated.

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Committee: NEC-P12

Public Input No. 2994-NFPA 70-2023 [Section No. 620.3(B)]

(B) Lighting Circuits.

Lighting circuits shall comply with the requirements of Article 410, Part I through Part VI . .

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or where required for context. It appears the installation requirements of Parts I through Part VI appropriately cover the installations of lighting circuits for hoistways so the reference has been adjusted accordingly.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 2233-NFPA 70-2023 [Sections 620.3(B), 620.3(C)]

Sections 620.3(B), 620.3(C)

~~**(C)**~~

(B)_

~~Lighting Circuits.~~

~~Lighting circuits shall comply with the requirements of Article~~ 410 ~~.~~

~~**Heating and Air-Conditioning Circuits.**~~

~~Branch circuits for heating and air-conditioning equipment located on the elevator car shall not have a circuit voltage in excess of 1000 volts.~~

Statement of Problem and Substantiation for Public Input

620.3 (B) is redundant. It should be deleted to comply with section 4.1.1 of the NEC Style Manual which states:
General requirements contained in Chapters 1 through 4 shall not be repeated in other articles of the document.

Changed (C) to (B)

Submitter Information Verification

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Submittal Date: Tue Aug 15 12:41:01 EDT 2023
Committee: NEC-P12

Public Input No. 1246-NFPA 70-2023 [New Section after 620.6]

TITLE OF NEW CONTENT

Type your content here ...

620.7. Cybersecurity

Elevators, dumbwaiters, escalators, moving walks, lifts, and chairlifts that are connected to a communication network and have the capability to be controlled or permit control of any portion of the premises shall comply with either of the following:

(1) The ability to control the system is limited to a direct connection through a local nonnetworked interface.

(2) The elevator, dumbwaiter, escalator, moving walk, lift, and chairlift is connected through a networked interface complying with both of the following methods:

a. The elevator, dumbwaiter, escalator, moving walk, lift and chairliftl and associated software are identified as being evaluated for cybersecurity.

b. A cybersecurity assessment is conducted on the connected system to determine vulnerabilities to cyber attacks.

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

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

Informational Note No. 1: See ANSI/ISA 62443, Cybersecurity Standards series; UL 2900, Cybersecurity Standards series; and the NIST Framework for Improving Critical Infrastructure Cybersecurity, Version 1.1, for assessment guidelines.

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

(1) The ISA Security Compliance Institute (ISCI) conformity assessment program

(2) Certification of compliance by a nationally recognized test laboratory

Statement of Problem and Substantiation for Public Input

Most of the cybersecurity focus has been on IT systems. There has been very little public discussion about cybersecurity for Operational Technology (OT), but cyber attacks on OT, by both domestic and foreign actors, occur on almost a daily basis. Hackers can easily destroy unprotected equipment and shut down entire unprotected facilities. Our adversaries such as Russia, China, North Korea, and Iran, are continuously mounting cyber attacks. They understand their limits and, so far, prohibit catastrophic attacks on our financial/banking system and electrical grid. In the mean time, they attack our infrastructure, such as the southeast gas pipeline. We have the ability, and obligation, to prevent this type of damage to our infrastructure from malicious cyber attacks. This Public Input is based upon 240.6(D) and 708.7 in the 2023 NEC. Pay particular attention to the word "identified" in (2) a. "Identified" as applied to equipment, is defined in Article 100 as "Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular Code requirement. Informational Note: Some examples of ways to determine suitability of equipment for a specific purpose, environment, or application include investigations by a qualified testing

laboratory (listing and labeling), an inspection agency, or other organization concerned with product evaluation." This Public Input simply requires that an elevator, dumbwaiter, escalator, moving walk, lift, or chairlift either not be connected to the internet, or if it is connected to the internet, that it be identified for cybersecurity and that an assessment is provided.

Submitter Information Verification

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Submittal Date: Fri Jun 30 11:42:01 EDT 2023
Committee: NEC-P12

Public Input No. 4458-NFPA 70-2023 [Section No. 620.6(C)]

(C) Sump Pumps in Elevator Pits .

A permanently installed sump pump shall be ~~permanently wired or shall be~~ supplied by a receptacle that is protected by a listed Class A ground-fault circuit-interrupter.

Exception: A permanently installed sump that is permanently wired shall not be required to have GFCI protection for personell as stated in 210.8(D) and 422.5(A)

Statement of Problem and Substantiation for Public Input

Section 620.6 has been subdivided into A, B, and C in the 2023 NEC. A and B both refer to specific locations, but (C), "Sump Pumps," does not refer to a specific location even though the location in the elevator pit seems to be intended by the requirement. Adding the location to the title will help clarify that the requirement modifies General GFCI protection for personnel requirements regarding Sump Pumps in chapter 2 and chapter 4.

The wording of 620.6(C) does not clearly state what is required and could easily be misinterpreted. Outlets supplying sump pumps are required to have GFCI protection for personnel by 210.8(D) and the sump pump appliance itself is required to have GFCI protection according to 422.5(A) If these general requirements are to be modified by 620.6(C) such that a permanently installed and permanently wired sump pump in an elevator pit is not required to have GFCI protection for personnel, then it needs to be written very clearly. It could also be interpreted that a permanently wired sump pump shall have GFCI protection for personnel simply because it is written as a subsection of 620.6 Ground-Fault Circuit-Interrupter Protection for Personnel and there is no language saying GFCI protection is specifically not required. By writing the GFCI protected receptacle requirement as the positive rule for permanently installed sump pumps and adding an exception that a permanently wired sump pump is permitted to be installed without GFCI protection, the requirements of the two differing installations are more clear. It is also more clear that this special equipment article is modifying sump pump requirements found in Chapter 2 and Chapter 4.

Submitter Information Verification

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Submittal Date:	Thu Sep 07 15:44:53 EDT 2023
Committee:	NEC-P12

Public Input No. 670-NFPA 70-2023 [Section No. 620.6(C)]

~~(C) Sump Pumps.~~

~~A permanently installed sump pump shall be permanently wired or shall be supplied by a receptacle that is protected by a listed Class A ground-fault circuit-interrupter.~~

Statement of Problem and Substantiation for Public Input

As currently written, this rule does not modify the requirement of 422.5(A)(6). All it does is give two options for wiring it-- cord-and-plug connection and direct connection. Neither option, as written, removes the GFCI protection. Due to this, there is no reason for this section to even exist.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 3826-NFPA 70-2023 [New Section after 620.16]

TITLE OF NEW CONTENT

(C) Available Fault Current Field Marking.

The elevator control panel shall be legibly marked in the field with the available fault current at its line terminals. The field marking(s) shall include the date the available fault current calculation was performed and shall meet the requirements of 110.21(B). The calculation shall be documented and made available to those authorized to design, install, inspect, maintain, or operate the system.

When modifications to the electrical system occur that affect the available fault current at the elevator control panel, the available fault current shall be verified or recalculated as necessary to ensure the elevator control panel's short-circuit current rating is sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) shall be adjusted to reflect the new level of available fault current.

Type your content here ...

Statement of Problem and Substantiation for Public Input

It is critical that an elevator control panel can handle the available fault current at its point of installation. Given the design complexity of the elevator control panel, it can often have a low short circuit current rating. This change provides much needed information to aid the electrical inspector when enforcing 620.16(B). It will help the inspector ensure that the elevator control panel is installed within its short-circuit current rating. Without this information, it is very difficult for an electrical inspector to verify the conditions of 620.16(B) are met.

This requirement was in the 2020 NEC under 620.51(D). It was modified in the 2023 NEC to apply to the elevator disconnecting means instead of the elevator control panel, because Section 620.51 covers the disconnecting means and not the elevator control panel (per the CMP statement). The marking of the elevator control panel should still be a requirement in the Code; however, it should be located in Section 620.16, as this section already addresses elevator control panel SCCR, and is consistent with the language for industrial machinery in 670.5(2).

This proposal is also consistent with requirements found for the elevator disconnecting means in 620.51(D), along with other equipment such as service entrances in sections 110.24 (A) & (B).

Submitter Information Verification

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Submittal Date: Tue Sep 05 17:54:26 EDT 2023
Committee: NEC-P12

Public Input No. 3361-NFPA 70-2023 [New Section after 620.21(A)(1)]

f) Protection of wiring methods embedded in elevator hoistway walls and pit floors.

Wiring methods embedded in the concrete or masonry walls of the hoistway and pit floors shall be protected in accordance with 300.4(I) and 305.13.

Statement of Problem and Substantiation for Public Input

Incidents have occurred where elevator mechanics have drilled into hoistway walls and machine room floors and struck live unmarked conductors. Fortunately, there were no injuries. In the hoistway, it is a common procedure to drill into the concrete to install anchors for rail brackets. The added proposed language adds a requirement to ensure that conductors, cables and other types of wiring methods get marked to avoid being damaged or personal injury.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3353-NFPA 70-2023 [New Section after 300.4]	
Public Input No. 3357-NFPA 70-2023 [New Article after 305]	

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 2995-NFPA 70-2023 [Section No. 620.21(A)(1)]

(1) Hoistways and Pits.

(a) Types CL2P, CL2R, and CL2 cables shall be permitted, provided the cables are supported and protected from physical damage. Substitute cables for Class 2 cables installed in accordance with 722.135(E) shall be permitted.

(b) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(c) The following wiring methods shall be permitted in the hoistway in lengths not to exceed 1.8 m (6 ft):

(4) Flexible metal conduit.

(5) Liquidtight flexible metal conduit.

(6) Liquidtight flexible nonmetallic conduit.

(7) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage, shall be of a flame-retardant type, and shall be part of one of the following:

(8) Listed equipment

(9) Driving machine

(10) Driving machine brake

Exception to 620.21(A)(1)(c)(1), (A)(1)(c)(2), and (A)(1)(c)(3): The conduit length shall not be required to be limited between risers and limit switches, interlocks, operating buttons, and similar devices.

(k) A sump pump or oil recovery pump located in the pit shall be permitted to be cord connected. The cord shall be a hard usage oil-resistant type, of a length not to exceed 1.8 m (6 ft), and shall be located to be protected from physical damage.

(l) Hard-service cords and junior hard-service cords that conform to the requirements of ~~Article~~ 400 ~~(~~ Table 400.4~~) shall~~ shall be permitted as flexible connections between the fixed wiring in the hoistway and hoistway access switches when located in the hoistway door sight guard.

Informational Note: See ASME A17.1-2019/CSA B44-19, *Safety Code for Elevators and Escalators*.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing the entire article except Article 100 or where required for context. The current text references hard service or junior hard service as found in Table 400.4 and that seems like it should be sufficient to point the user to the correct location for the requirements. This section isn't modifying the lanugage in Article 400, except as specifically noted, so

Section 90.3 of the NEC(r) would apply in this instance as well.

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Submittal Date: Mon Aug 28 15:05:36 EDT 2023
Committee: NEC-P12

Public Input No. 4346-NFPA 70-2023 [Section No. 620.21(A)(1)]

(1) Hoistways and Pits.

(a) Types CL2P, CL2R, and CL2 cables shall be permitted, provided the cables are supported and protected from physical damage. Substitute cables for Class 2 cables installed in accordance with 722.135(E) shall be permitted.

(b) Types CL4P, CL4R, and CL4 cables shall be permitted, provided the cables are supported and protected from physical damage.

(c) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(d) The following wiring methods shall be permitted in the hoistway in lengths not to exceed 1.8 m (6 ft):

(5) Flexible metal conduit.

(6) Liquidtight flexible metal conduit.

(7) Liquidtight flexible nonmetallic conduit.

(8) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage, shall be of a flame-retardant type, and shall be part of one of the following:

(9) Listed equipment

(10) Driving machine

(11) Driving machine brake

Exception to 620.21(A)(1)(c)(1), (A)(1)(c)(2), and (A)(1)(c)(3): The conduit length shall not be required to be limited between risers and limit switches, interlocks, operating buttons, and similar devices.

(l) A sump pump or oil recovery pump located in the pit shall be permitted to be cord connected. The cord shall be a hard usage oil-resistant type, of a length not to exceed 1.8 m (6 ft), and shall be located to be protected from physical damage.

(m) Hard-service cords and junior hard-service cords that conform to the requirements of Article 400 (Table 400.4) shall be permitted as flexible connections between the fixed wiring in the hoistway and hoistway access switches when located in the hoistway door sight guard.

Informational Note: See ASME A17.1-2019/CSA B44-19, *Safety Code for Elevators and Escalators*.

Statement of Problem and Substantiation for Public Input

Allowing Class 4 systems as an alternative to Class 2 circuits. Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An

effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 2996-NFPA 70-2023 [Section No. 620.21(A)(2)]

(2) Cars.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, not exceeding 1.8 m (6 ft) in length, shall be permitted on cars where so located as to be free from oil and if securely fastened in place.

Exception: Liquidtight flexible nonmetallic conduit (LFNC-B) of metric designator 12 (trade size ⅜) or larger shall be permitted in lengths in excess of 1.8 m (6 ft).

(b) Hard-service cords and junior hard-service cords that conform to the requirements of ~~Article~~ 400 ~~(~~ Table 400.4~~) shall~~ shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates. Hard-service cords only shall be permitted as flexible connections for the top-of-car operating device or the car-top work light. Devices or luminaires shall be grounded by means of an equipment grounding conductor run with the circuit conductors. Cables with smaller conductors and other types and thicknesses of insulation and jackets shall be permitted as flexible connections between the fixed wiring on the car and devices on the car doors or gates, if listed for this use.

(c) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(d) The following wiring methods shall be permitted on the car assembly in lengths not to exceed 1.8 m (6 ft):

(5) Flexible metal conduit

(6) Liquidtight flexible metal conduit

(7) Liquidtight flexible nonmetallic conduit

(8) Flexible cords and cables, or conductors grouped together and taped or corded, shall be permitted to be installed without a raceway. They shall be located to be protected from physical damage and shall be of a flame-retardant type and shall be part of one of the following:

(9) Listed equipment

(10) A driving machine

(11) A driving machine brake

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing the entire article except Article 100 or where required for context. The current text references hard service or junior hard service as found in Table 400.4 and that seems like it should be sufficient to point the user to the correct location for the requirements. This section isn't modifying the lanugage in Article 400, except as specifically noted, so Section 90.3 of the NEC(r) would apply in this instance as well. The only revision proposed for this section is the deletion of "Article 400". Other items underlined in the submission are existing text.

Submitter Information Verification

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Submittal Date: Mon Aug 28 15:11:29 EDT 2023
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Public Input No. 2998-NFPA 70-2023 [Section No. 620.21(A)(3)]

(3) Within Machine Rooms, Control Rooms, and Machinery Spaces and Control Spaces.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, not exceeding 1.8 m (6 ft) in length, shall be permitted between control panels and machine motors, machine brakes, motor-generator sets, disconnecting means, and pumping unit motors and valves.

Exception: Liquidtight flexible nonmetallic conduit (LFNC-B) metric designator 12 (trade size ⅜) or larger shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(b) Where motor-generators, machine motors, or pumping unit motors and valves are located adjacent to or underneath control equipment and are provided with extra-length terminal leads not exceeding 1.8 m (6 ft) in length, such leads shall be permitted to be extended to connect directly to controller terminal studs without regard to the current carrying-capacity requirements of Articles 430 and 445. Auxiliary gutters shall be permitted in machine and control rooms between controllers, starters, and similar apparatus.

(c) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(d) On existing or listed equipment, conductors shall also be permitted to be grouped together and taped or corded without being installed in a raceway. Such cable groups shall be supported at intervals not over 900 mm (3 ft) and located so as to be protected from physical damage.

(e) Flexible cords and cables in lengths not to exceed 1.8 m (6 ft) that are of a flame-retardant type and located to be protected from physical damage shall be permitted in these rooms and spaces without being installed in a raceway. They shall be part of one of the following:

(6) Listed equipment

(7) A driving machine

(8) A driving machine brake

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style manual prohibits referencing an entire article except Article 100 or where required for context. In this case, it appears we should leave the reference to the "current carrying capacity requirements of Article 40 and 445", however the word "current" was inadvertently omitted from the 2023 publication and it is proposed to be reinstated with this public input. No other change is proposed here, so underlining of (E)(1) through (E)(3) is erroneous.

Submitter Information Verification

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Committee:	NEC-P12

Public Input No. 3362-NFPA 70-2023 [Section No. 620.21(A)(3)]

(3) Within Machine Rooms, Control Rooms, and Machinery Spaces and Control Spaces.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size ⅜), or larger, not exceeding 1.8 m (6 ft) in length, shall be permitted ~~between control panels and machine motors, machine brakes, motor-generator sets, disconnecting means, and pumping unit motors and valves~~ .

Exception: Liquidtight flexible nonmetallic conduit (LFNC-B) metric designator 12 (trade size ⅜) or larger shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(b) Where motor-generators, machine motors, or pumping unit motors and valves are located adjacent to or underneath control equipment and are provided with extra-length terminal leads not exceeding 1.8 m (6 ft) in length, such leads shall be permitted to be extended to connect directly to controller terminal studs without regard to the carrying-capacity requirements of Articles 430 and 445. Auxiliary gutters shall be permitted in machine and control rooms between controllers, starters, and similar apparatus.

(c) Flexible cords and cables that are components of listed equipment and used in circuits operating at 30 volts rms or less or 42 volts dc or less shall be permitted, provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(d) On existing or listed equipment, conductors shall also be permitted to be grouped together and taped or corded without being installed in a raceway. Such cable groups shall be supported at intervals not over 900 mm (3 ft) and located so as to be protected from physical damage.

(e) Flexible cords and cables in lengths not to exceed 1.8 m (6 ft) that are of a flame-retardant type and located to be protected from physical damage shall be permitted in these rooms and spaces without being installed in a raceway. They shall be part of one of the following:

(6) Listed equipment

(7) A driving machine

(8) A driving machine brake

Statement of Problem and Substantiation for Public Input

Amend section 620.21 (A)(3) to remove the detailed list of components which are permitted to have FMC in the machine room/control space, and just have the sentence end at "… not exceeding 1.8m (6 feet) in length shall be permitted". The use of flexible metal conduit is recognized as safe when limited in length, there is no value in maintaining a list of components which may no longer be relevant.

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Submittal Date:	Fri Sep 01 14:38:52 EDT 2023
Committee:	NEC-P12

Public Input No. 3037-NFPA 70-2023 [Section No. 620.21(B)(3)]

(3) Flexible Cords.

Hard-service cords that conform to the requirements of ~~Article~~ 400 ~~(~~ Table 400.4~~)~~ ~~shall~~ shall be permitted as flexible connections on escalators and moving walk control panels and disconnecting means where the entire control panel and disconnecting means are arranged for removal from machine spaces as permitted in 620.5.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing the entire article except Article 100 or where required for context. The current text references hard service as found in Table 400.4 and that seems like it should be sufficient to point the user to the correct location for the requirements. This section isn't modifying the lanugage in Article 400, except as specifically noted, so Section 90.3 of the NEC(r) would apply in this instance as well.

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Committee: NEC-P12

Public Input No. 1124-NFPA 70-2023 [Section No. 620.22(A)]

(A) Car Light Receptacles, Auxiliary Lighting, and Ventilation.

A separate branch circuit shall supply the car lights. The car lights branch circuit shall be permitted to supply ~~receptacles (alarm devices, emergency responder radio coverage (ERRC), car ventilation purification systems, monitoring devices not part of the control system),~~ auxiliary lighting power source, car emergency signaling, communications devices (including their associated charging circuits),~~ and ventilation~~ ventilation on each elevator car or inside the operation controller~~. The~~ , car ventilation purification systems, and receptacles for:

(1) (alarm devices

(2) emergency responder radio coverage (ERRC)

(3) car ventilation purification systems

(4) monitoring devices not part of the control system)

The overcurrent device protecting the branch circuit shall be located in the elevator machine room, control room, machinery space, or control space. Where there is no machine room, control room, machinery space, or control space outside the hoistway, the overcurrent device shall be located outside the hoistway and accessible to qualified persons only.

Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

Statement of Problem and Substantiation for Public Input

Reorganized and created list format to follow requirements in Section 2.1.5.1 of the NEC Style Manual for ease of reading.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 2331-NFPA 70-2023 [Section No. 620.22(A)]

(A) Car Light Receptacles, Auxiliary Lighting, and Ventilation.

A separate branch circuit shall supply the car lights (clarify if one branch circuit can supply the lights for multiple cars) . The car lights branch circuit shall be permitted to supply receptacles (alarm devices, emergency responder radio coverage (ERRC), car ventilation purification systems, monitoring devices not part of the control system), auxiliary lighting power source, car emergency signaling, communications devices (including their associated charging circuits), and ventilation on each elevator car or inside the operation controller. The overcurrent device protecting the branch circuit shall be located in the elevator machine room, control room, machinery space, or control space. Where there is no machine room, control room, machinery space, or control space outside the hoistway, the overcurrent device shall be located outside the hoistway and accessible to qualified persons only.

Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

Statement of Problem and Substantiation for Public Input

620.22 (A) clarify if the required separate circuit for car lights is for each car and that not one separate branch circuit is not to supply the car lights for multiple elevator cars.

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Public Input No. 3368-NFPA 70-2023 [Section No. 620.22(A)]

(A) Car Light Receptacles, Auxiliary Lighting, and Ventilation.

A separate branch circuit shall supply the car lights. The car lights branch circuit shall be permitted to supply:

(1) receptacles,

(2) alarm devices,

(3) emergency responder radio coverage (ERRC),

(4) car ventilation purification systems,

(5) monitoring devices not part of the control system,

(6) ~~,~~ auxiliary lighting power source,

(7) decorative lighting,

(8) car emergency signaling,

(9) communications devices (including their associated charging circuits),~~ and~~

(10) ventilation on each elevator car or inside the operation controller.

The overcurrent device protecting the branch circuit shall be located in the elevator machine room, control room, machinery space, or control space. Where there is no machine room, control room, machinery space, or control space outside the hoistway, the overcurrent device shall be located outside the hoistway and accessible to qualified persons only.

Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

Statement of Problem and Substantiation for Public Input

Decorative lighting should be included in the code section 620.22(A) to explicitly permit use of the car lighting branch circuit for lighting which may utilize special lighting fixture housings. Decorative lighting enhances the riding experience in the similar way a car ventilation purification system provides an enhanced and premium riding experience. This lighting is typically not used to directly light the car but is a common occurrence used for decorative purposes to improve passenger comfort. Decorative lighting is typically installed very near or in the locations of standard required lighting. Reformatted into a list of allowed devices to improve clarity.

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Public Input No. 4198-NFPA 70-2023 [Section No. 620.22(A)]

(A) Car Light Receptacles, Auxiliary Lighting, and Ventilation.

(1) Separate Branch Circuit. A separate branch circuit shall supply the car lights. The car lights branch circuit shall be permitted to supply receptacles (alarm devices, emergency responder radio coverage (ERRC), car ventilation purification systems, monitoring devices not part of the control system), auxiliary lighting power source, car emergency signaling, communications devices (including their associated charging circuits), and ventilation on each elevator car or inside the operation controller.

(2) Overcurrent Protective Device. The overcurrent device protecting the branch circuit shall be located in the elevator machine room, control room, machinery space, or control space. Where there is no machine room, control room, machinery space, or control space outside the hoistway, the overcurrent device shall be located outside the hoistway and accessible to qualified persons only.

Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

Statement of Problem and Substantiation for Public Input

Breaking up 620.22(A) into a list item format to facilitate understanding for Code users. In accordance with NFPA Style Manual section 3.5.1.2 additional subdivisions shall be used where multiple requirements can be broken into independent requirements.

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Committee: NEC-P12

Public Input No. 2332-NFPA 70-2023 [Section No. 620.24]

620.24 ~~Branch Circuit for~~ Hoistway Pit Lighting ~~and Receptacles.~~ , Receptacle Requirements and Required Branch Circuits

(A) Separate Branch Circuits.

Separate branch circuits shall supply the hoistway pit lighting and receptacles.

Required lighting shall not be connected to the load side of a ground-fault circuit interrupter.

(B) Lighting Switch.

The lighting switch shall be so located as to be readily accessible from the pit access door.

(C) Duplex Receptacle.

At least one 125-volt, single-phase, 15- or 20-ampere duplex receptacle shall be provided in the hoistway pit.

Informational Note No. 1: See ASME A17.1-2016/CSA B44-16, *Safety Code for Elevators and Escalators*, for illumination levels.

Informational Note No. 2: See 620.6 for ground-fault circuit-interrupter requirements.

Statement of Problem and Substantiation for Public Input

620.24 - rename article to “Hoistway Pit Lighting, Receptacle Requirements and Required Branch Circuits”. The current article title implies that the article is limited to covering required branch circuits for hoistway pit lighting and receptacles. The article is more extensive as it also covers lighting switch location and defines required receptacle type (duplex) and associated GFCI protection.

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Public Input No. 546-NFPA 70-2023 [Section No. 620.24]

620.24 Branch Circuit for Hoistway Pit Lighting and Receptacles.

(A) Separate Branch Circuits.

~~Separate branch circuits shall supply the hoistway~~

Hoistway pit lighting and receptacles shall not be served by the same branch circuit .

~~Required lighting~~ Lighting outlets shall not be ~~connected to the load side of a ground-fault circuit interrupter~~ GFCI-protected .

(B) Lighting Switch.

The lighting ~~switch shall be so located as to be~~ outlet for the pit shall be controlled by a listed wall-mounted control device that is readily accessible from the pit access door.

~~**(C)** Duplex Receptacle.~~

At least one 125-volt, ~~single-phase,~~ 15- or 20-ampere duplex receptacle shall be provided in the hoistway pit.

Informational Note No. 1: See ASME A17.1-2016/CSA B44-16, *Safety Code for Elevators and Escalators*, for illumination levels.

Informational Note No. 2: See 620.6 for ground-fault circuit-interrupter requirements.

Statement of Problem and Substantiation for Public Input

This revisions should be viewed as editorial in nature.
(A) should be revised to remove any question about the number of circuits required for lighting and receptacles. As currently written, the section requires "separate circuits." While the intent is certainly that the circuits be separate from each other, i.e. the lights not on not the same circuit as the receptacle, there are plenty who believe "separate" means separate from other equipment in the pit. The second sentence in (A) is marked for revision to provide consistency with other NEC requirements. The term "GFCI-protected" is used numerous times throughout the code, whereas the current language is used only in Article 620.
(B) is marked for revision to also provide consistency with other code requirements, particularly 210.70.
(C) is marked for revision because the term "single-phase" is superfluous. A 125V receptacle is not going to be a three-phase device.

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Committee: NEC-P12

Public Input No. 579-NFPA 70-2023 [Section No. 620.32]

~~**620.32** Metal Wireways and Nonmetallic Wireways.~~

~~The sum of the cross-sectional area of the individual conductors in a wireway shall not be more than 50 percent of the interior cross-sectional area of the wireway.~~

~~Vertical runs of wireways shall be securely supported at intervals not exceeding 4.5 m (15 ft) and shall have not more than one joint between supports. Adjoining wireway sections shall be securely fastened together to provide a rigid joint.~~

Additional Proposed Changes

File Name	Description	Approved
376.22_A_.jpg	An example of how absurd 50% fill would be.	

Statement of Problem and Substantiation for Public Input

Filling a wireway to 50% would result in a wireway that could not possibly have a cover on it. Please do the math. Everything in this section is already (or better) addressed in 376.22 and 376.30. See 90.3 and 4.1.1 of the Style Manual.

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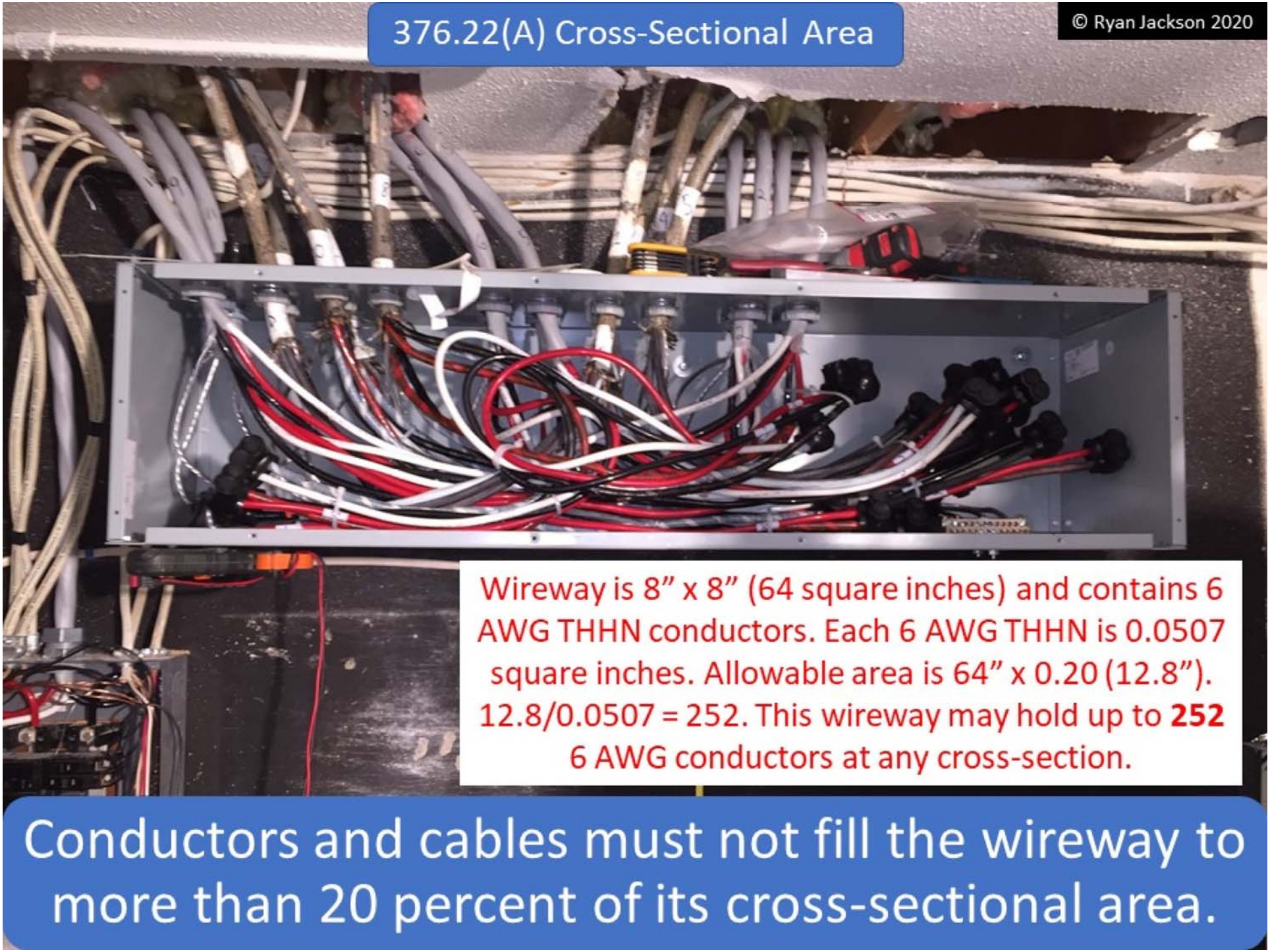
Submittal Date: Mon Apr 10 14:13:44 EDT 2023
Committee: NEC-P12


376.22(A) Cross-Sectional Area
© Ryan Jackson 2020
Wireway is 8” x 8” (64 square inches) and contains 6 AWG THHN conductors. Each 6 AWG THHN is 0.0507 square inches. Allowable area is 64” x 0.20 (12.8”). 12.8/0.0507 = 252. This wireway may hold up to **252** 6 AWG conductors at any cross-section.
Conductors and cables must not fill the wireway to more than 20 percent of its cross-sectional area.

Public Input No. 578-NFPA 70-2023 [Section No. 620.33]

~~**620.33** Number of Conductors in Raceways.~~

~~The sum of the cross-sectional area of the individual conductors in raceways shall not exceed 40 percent of the interior cross-sectional area of the raceway, except as permitted in 620.32 for wireways.~~

Additional Proposed Changes

File Name	Description	Approved
300.17_alt2.jpg	Raceway fill diagram showing the impossibility of two conductors exceeding 32%.	

Statement of Problem and Substantiation for Public Input

This is already required by 300.17 and the 3xx.22 sections of the applicable raceway article. This section COULD supplement or modify those sections, but it doesn't. That is, unless the CMP truly wishes to allow two conductors to exceed 31% fill, in which case I suggest they try doing the math and seeing what that looks like.

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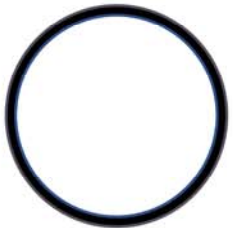
Submittal Date: Mon Apr 10 14:08:28 EDT 2023
Committee: NEC-P12

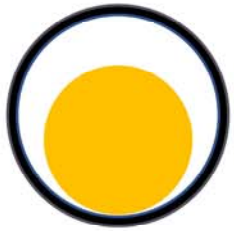
300.17 Number of Conductors in Raceway

Number of Conductors	Max. Fill %
1	53
2	31
More than 2	40
24” raceway length or less	60

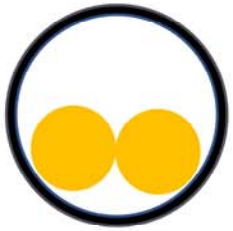
Based on trade size 1 EMT Chapter 9, Table 4



Total area: 0.864 sq in

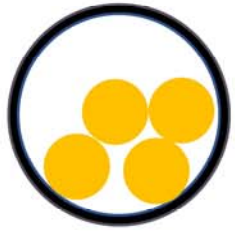


53%: 0.458 sq in (1) 0.458” conductor



31%: 0.268 sq in (2) 0.134” conductors

40%: 0.346 sq in (3) 0.115” conductors



40%: 0.346 sq in (4) 0.085” conductors

60%: 0.519 sq in (3) 0.173” conductors

The number of conductors or cables in a raceway is limited to ensure that they can be installed without damaging their insulation.

Public Input No. 1455-NFPA 70-2023 [Section No. 620.37(A)]

(A) Uses Permitted.

~~Electrical~~ Only electrical wiring, raceways, and cables used directly in connection with the elevator or dumbwaiter shall be permitted inside the hoistway, machine rooms, control rooms, machinery spaces, and control spaces, including wiring for the following:

(1) Signals

(2) Communications with the car

(3) Fire detection systems

(4) Pit sump pumps

(5) Branch circuits in 620.24

(6) Heating, lighting, and ventilating the hoistway

(7) Heating, air conditioning, lighting, and ventilating the elevator car

.

Statement of Problem and Substantiation for Public Input

There is no mandatory language in this section. If the intent is to limit wiring in these spaces, the word "only" needs to be added.

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Submittal Date: Mon Jul 17 15:03:37 EDT 2023
Committee: NEC-P12

Public Input No. 3343-NFPA 70-2023 [Section No. 620.51]

620.51 Disconnecting Means.

A single means for disconnecting all ungrounded main power supply conductors for each control system of an elevator, dumbwaiter, escalator, moving walk, platform lift, or stairway chairlift shall be provided and be designed so that no pole can be operated independently. Where multiple driving machines are connected to a single elevator, escalator, moving walk, or pumping unit, there shall be one disconnecting means to disconnect the motor(s) and control valve operating magnets.

The disconnecting means for the main power supply conductors shall not disconnect the branch circuits required in 620.22, 620.23, and 620.24.

(A) Type.

The disconnecting means shall be an enclosed externally operable fused motor circuit switch or circuit breaker that is lockable only in the open position in accordance with 110.25.

The disconnecting means shall be a listed device.

Informational Note No. 1: See ASME A17.1-2019/CSA B44-19, *Safety Code for Elevators and Escalators*, for additional information.

Informational Note No. 2: See ASME A18.1-2017, *Safety Standard for Platform Lifts and Stairway Chairlifts*, for additional information.

Exception No. 1: Where an individual branch circuit supplies a platform lift, the disconnecting means required by 620.51(C)(4) shall be permitted to comply with 430.109(C). This disconnecting means shall be listed and shall be lockable open in accordance with 110.25.

Exception No. 2: Where an individual branch circuit supplies a stairway chairlift or where a stairway chairlift is supplied by batteries as the primary source, the stairway chairlift shall be permitted to be cord-and-plug-connected, provided it complies with 422.16(A) and the cord does not exceed 1.8 m (6 ft) in length.

Exception No. 3: Where an individual branch circuit supplies an elevator control system with an Adjustable Speed Drive, the disconnecting means required by 620.51(C)(1) shall be permitted to comply with 430.128 and be rated for not less than 115 percent of the nameplate of the control system (includes conversion equipment and other loads). This disconnecting means shall be listed and shall be lockable open in accordance with 110.25

(B) Operation.

No provision shall be made to open or close this disconnecting means from any other part of the premises. If sprinklers are installed in hoistways, machine rooms, control rooms, machinery spaces, or control spaces, the disconnecting means shall be permitted to automatically open the power supply to the affected elevator(s) prior to the application of water. No provision shall be made to automatically close this disconnecting means. Power shall only be restored by manual means.

Informational Note: To reduce hazards associated with water on live elevator electrical equipment.

(C) Location.

The disconnecting means shall be located where it is readily accessible to qualified persons.

(1) On Elevators Without Generator Field Control.

On elevators without generator field control, the disconnecting means shall be located within sight of the motor controller. Where the motor controller is located in the elevator hoistway, the disconnecting means required by 620.51(A) shall be located outside the hoistway and accessible to qualified persons only. An additional fused or non-fused, enclosed, externally operable motor-circuit switch that is lockable open in accordance with 110.25 to disconnect all ungrounded main power-supply conductors shall be located within sight of the motor controller. The additional switch shall be a listed device and shall comply with 620.91(C).

Driving machines or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.

Where the driving machine of an electric elevator or the hydraulic machine of a hydraulic elevator is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power-supply conductors shall be provided and be lockable open in accordance with 110.25.

(2) On Elevators with Generator Field Control.

On elevators with generator field control, the disconnecting means shall be located within sight of the motor controller for the driving motor of the motor-generator set. Driving machines, motor-generator sets, or motion and operation controllers not within sight of the disconnecting means shall be provided with a manually operated switch installed in the control circuit to prevent starting. The manually operated switch(es) shall be installed adjacent to this equipment.

Where the driving machine or the motor-generator set is located in a remote machine room or remote machinery space, a single means for disconnecting all ungrounded main power-supply conductors shall be provided and be lockable open in accordance with 110.25.

(3) On Escalators and Moving Walks.

On escalators and moving walks, the disconnecting means shall be installed in the space where the controller is located.

(4) On Platform Lifts and Stairway Chairlifts.

On platform lifts and stairway chairlifts, the disconnecting means shall be located within sight of the motor controller.

(D) Identification and Signs.

(1) Available Fault Current Field Marking.

The disconnecting means shall be legibly marked in the field with the available fault current at its line terminals. The field marking(s) shall include the date the available fault current calculation was performed and be of sufficient durability to withstand the environment involved.

When modifications to the electrical installation occur that affect the available fault current at the disconnecting means, the available fault current shall be verified or recalculated as necessary to ensure the elevator equipment's short-circuit current rating is sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) shall be adjusted to reflect the new level of available fault current.

(E) Surge Protection.

Where any of the disconnecting means in 620.51 has been designated as supplying an emergency system load, a legally required system load, or a critical operation power system load, a listed SPD shall be installed.

Statement of Problem and Substantiation for Public Input

The addition of exception No. 3 is to connect the “Adjustable Speed Drive” requirements within article 430 with the use of Adjustable Speed Drives in elevator control systems disconnecting means of 620.51. The need for the disconnect means required in article 620.51 does not need to be able to withstand lock-rotor currents or other characteristics of a motor that has an adjustable speed drive

controlling it. The motor characteristics are protected by the adjustable speed drive load side. This concept is taken care of in section 430 part IX and allows the disconnect means to be rated for not less than 115% of the conversion equipment. Putting this exception in not only permits the disconnecting means to be rated current instead of horse-power it pulls in the other loads for the control system that includes the conversion equipment.

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Committee: NEC-P12

Public Input No. 3811-NFPA 70-2023 [Section No. 620.51(D)(1)]

(1) Available Fault Current Field Marking.

The disconnecting means shall be legibly marked in the field with the available fault current at its line terminals. The field marking(s) shall include the date the available fault current calculation was performed and be of sufficient durability to withstand the environment involved.

When modifications to the electrical ~~installation~~ system occur that affect the available fault current at the disconnecting means, the available fault current shall be verified or recalculated as necessary to ensure the elevator equipment's short-circuit current rating is sufficient for the available fault current at the line terminals of the equipment. The required field marking(s) shall be adjusted to reflect the new level of available fault current.

Statement of Problem and Substantiation for Public Input

The use of the word “installation” implies the scope of changes is limited to only the conductors and equipment that the owner has installed. However, one of the most common changes that affect the available fault current is at the utility transformer. Using the word “system” instead of “installation” will ensure the Code includes any changes like this within its scope for when the available fault current shall be recalculated.

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Committee: NEC-P12

Public Input No. 3428-NFPA 70-2023 [Section No. 620.51(E)]

(E) Surge Protection.

~~Where any of the disconnecting means in~~ 620.51 ~~has been designated as supplying an emergency system load, a legally required system load, or a critical operation power system load, a listed SPD shall be installed~~ A surge-protective device (SPD) shall be provided as an integral part or installed immediately adjacent to the disconnecting means .

Statement of Problem and Substantiation for Public Input

This public input revises the section to require the SPD to be installed as an integral part or installed immediately adjacent to the disconnecting means required in 620.51 regardless of the load "designation." This language matches that used in section 230.67 and meets the original intent of Proposal 12-49 during the 2014 NEC cycle and Public Input 2794 during the 2017 NEC cycle. The safety and reliability of all elevator, dumbwaiter, escalator, moving walk, platform lift, or stairway chairlift circuits are just as essential under normally operating conditions as it is for this same equipment when designated as an emergency, legally required system, or COPS load.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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Submittal Date: Sat Sep 02 20:38:02 EDT 2023
Committee: NEC-P12

Public Input No. 1808-NFPA 70-2023 [Section No. 620.62]

620.62 Selective Coordination.

(A) General.

Where more than one driving machine disconnecting means is supplied by the same source, the overcurrent protective devices ~~in~~ (OCPDs) in each disconnecting means shall be selectively coordinated with any other supply-side ~~overcurrent protective devices~~ and load-side (OCPDs) .

Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection and device settings shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

(B) Replacements.

Where elevator system(s) OCPDs are replaced, they shall be reevaluated to ensure selective coordination is maintained with all supply-side and load-side OCPDs.

(C) Modifications.

If modifications, additions, or deletions to the elevator system(s) occur, selective coordination of the elevator system(s) OCPDs with all supply-side and load-side OCPDs shall be reevaluated.

Exception: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.

Statement of Problem and Substantiation for Public Input

Selective coordination is vital to ensure the reliability of elevator systems. The NEC has established that it is important that selective coordination be maintained throughout the life of the system in Sections 700.32(B) and (C), 701.32(B) and (C), and 708.54(B) and (C).

Selective coordination is achieved and verified based on the specific OCPDs and their ratings and settings and the available fault current at the time of installation. If any OCPDs supplying elevators are replaced, it will directly affect whether the OCPDs supplying elevators remains selectively coordinated.

Selective coordination should also be reevaluated after the replacement, modification, deletion, or addition of any OCPDs supplying elevators. Additionally, modifications to supply equipment, including transformers or conductor lengths, may result in changes to the available fault currents at the OCPDs supplying elevators. Therefore, to ensure selective coordination through the life of the system, selective coordination should be re-evaluated after these changes are made.

Submitter Information Verification

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Submittal Date: Fri Aug 04 14:37:00 EDT 2023
Committee: NEC-P12

Public Input No. 2445-NFPA 70-2023 [Section No. 620.62]

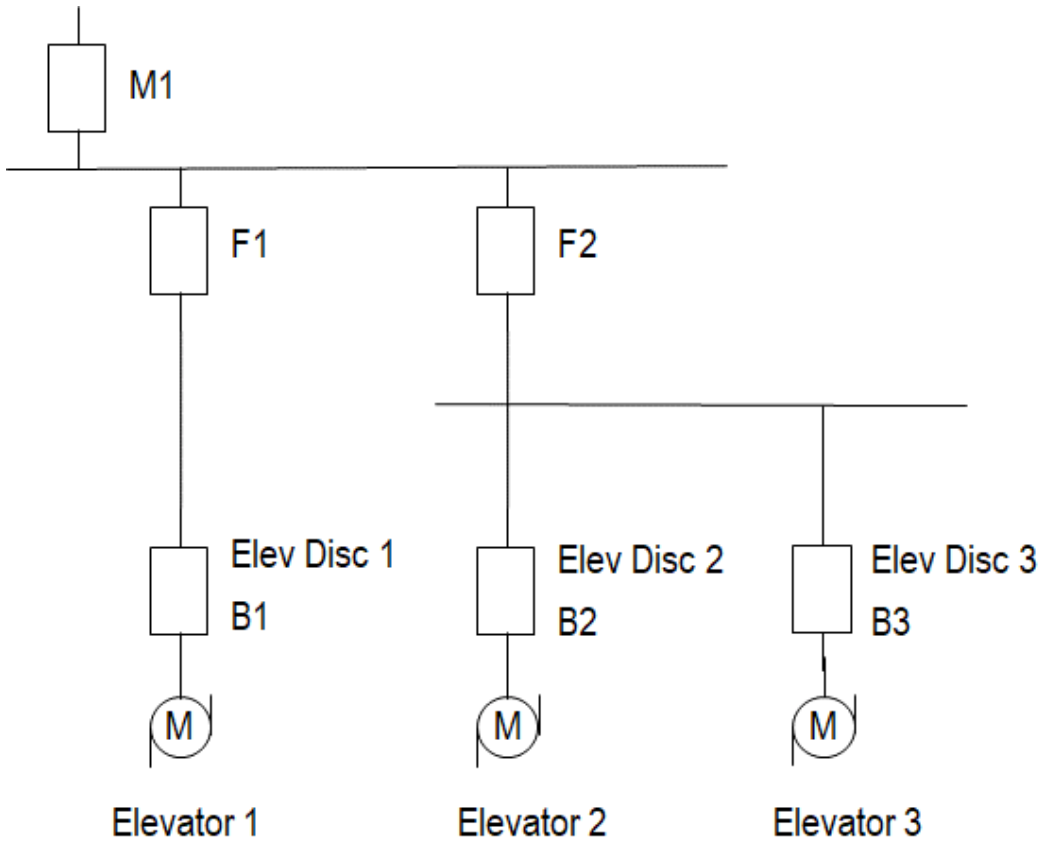
620.62 Selective Coordination.

Where more than one driving machine ~~disconnecting means~~ is supplied by the same source, the overcurrent protective devices ~~in each disconnecting means~~ (OCPDs) supplying the driving machines shall be selectively coordinated with any other supply-side ~~overcurrent protective devices~~ OCPDs .

Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection and device settings shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

Exception: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.

Informational Note: See Informational Note Figure 620.62 for an example of how OCPDs supplying elevators selectively coordinate with all supply-side OCPDs.



Informational Note Figure 620.62 Selective Coordination for overcurrent protective devices supplying more than one elevator.

OCPD B1 selectively coordinates with M1

OCPD F1 selectively coordinates with M1

OCPD B2 selectively coordinates with F2

OCPD B2 selectively coordinates with M1

OCPD F2 selectively coordinates with M1

OCPD B3 selectively coordinates with F2

OCPD B3 selectively coordinates with M1

OCPD B1 and F1 are not required to selectively coordinate due to the exception for OCPDs in series.

Statement of Problem and Substantiation for Public Input

This public input will result in improved clarity and usability of the Code with regards to selective coordination of elevator systems in the event of a short-circuit that results in loss of power to elevators which may be required for egress or first responder use.

The current language can be interpreted that only the overcurrent protective device in the elevator disconnecting means, as required by NEC 620.51, is the only overcurrent protective device that needs to be selectively coordinated with all supply-side overcurrent protective devices. However, it is possible that a short-circuit upstream of the overcurrent protective device in the elevator disconnecting means, could also cause a lack of selective coordination.

This public input clarifies that selective coordination needs to consider all overcurrent protective devices supplying elevators to assure an overcurrent condition will not result in loss of power to another elevator. An informational note and figure is added similar to that in NEC 700.32, 701.32 and 708.54.

Note: the exception shows new in Terra, but it is not new.

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Public Input No. 4497-NFPA 70-2023 [Section No. 620.62]

620.62 Selective Coordination.

Where more than one driving machine disconnecting means is supplied by the same source, the overcurrent protective devices in each disconnecting means shall be selectively coordinated with any other supply-side overcurrent protective devices for the period of time that a fault's duration extends beyond 0 . 1 second.

Selective coordination shall be selected by a licensed professional engineer or other qualified person engaged primarily in the design, installation, or maintenance of electrical systems. The selection and device settings shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

Exception: Selective coordination shall not be required between two overcurrent devices located in series if no loads are connected in parallel with the downstream device.

Statement of Problem and Substantiation for Public Input

In 2012, NFPA 99 the Technical Committee on Electrical System realized this issue and stated that 4.4.2.1.2.1 Selective Coordination – Overcurrent devices serving the essential electrical systems shall be selectively coordinated down to 0.1 second. This then became part of the National Electrical Code in Article 517.31(G) stating that "Coordination. Overcurrent protective devices serving the essential electrical system shall be coordinated for the period of time that a fault's duration extends beyond 0.1 second."
Health care is a critical system that deemed this to be a safer way to proceed with their electrical systems.

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Public Input No. 3038-NFPA 70-2023 [Section No. 620.84]

620.84 Escalators, Moving Walks, Platform Lifts, and Stairway Chairlifts.

Escalators, moving walks, platform lifts, and stairway chairlifts shall comply with ~~Article 250~~ the grounding and bonding requirements stated elsewhere in this Code .

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article other than Article 100 or where required for Context. Additionally, Section 90. applies so unless this section is modifying the requirements of Article 250, it really should be deleted entirely. If the committee chooses to keep the section, I believe it should just point to the "grounding and bonding requirements stated elsewhere in the Code" to meet the style manual requirements. Alternatively, the committee could point to a specific part of Article 250.

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Public Input No. 3040-NFPA 70-2023 [Section No. 620.91 [Excluding any Sub-Sections]]

Elevators shall be permitted to be powered by an emergency or standby power system.

Informational Note No. 1: See ASME A17.1-2016/CSA B44-16, *Safety Code for Elevators and Escalators*, 2.27.2, for additional information.

Informational Note No. 2: When an elevator is classified as a fire service access elevator or occupant evacuation operation elevator, some building codes require the elevator equipment, elevator hoistway lighting, ventilation and cooling equipment for elevator machine rooms, control rooms, machine spaces, and control spaces as well as elevator car lighting to be supplied by a legally required standby power systems ~~in compliance with Article 701~~ .

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) style manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In this case, changing the reference here to a "legally required standby system" should be sufficient as there is both a table of contents and an index that will take the user to the proper article. Alternatively, the panel could choose to provide a pointer to a specific part of the article as appropriate.

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Public Input No. 3191-NFPA 70-2023 [Article 625]

Article 625 Electric Vehicle Power Transfer System

Part I. General

625.1 Scope.

This article covers the electrical conductors and equipment connecting an electric vehicle to premises wiring for the purposes of charging, power export, or bidirectional current flow.

Informational Note No. 1: See NFPA 505-2018, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations*, for information on fire protection of industrial trucks.

Informational Note No. 2: See UL 2594-2016, *Electric Vehicle Supply Equipment*, for information on conductive electric vehicle supply equipment.

Informational Note No. 3: See UL 2202-2009, *Electric Vehicle Charging System Equipment*, for information on conductive electric vehicle charging equipment.

Informational Note No. 4: See UL 2750-2020, *Outline of Investigation for Wireless Power Transfer Equipment for Electric Vehicles*, for information on wireless power transfer equipment for transferring power to an electric vehicle.

Informational Note No. 5: See NECA 413-2019, *Installing and Maintaining Electric Vehicle Supply Equipment (EVSE)*, for information on the procedures for installing and maintaining AC Level 1, AC Level 2, and fast-charging dc electric vehicle supply equipment (EVSE).

625.4 Voltages.

Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, 600, or 1000 volts or dc system input voltages of up to 1000 volts shall be used to supply equipment covered by this article. Output voltages to the electric vehicle are not specified.

625.6 Listed.

Electric vehicle power transfer system equipment for the purposes of charging, power export, or bidirectional current flow shall be listed.

625.7 Location

Electric vehicle power transfer system equipment and the EV being charged shall not be located in or over a Class I hazardous location as defined in article 501.

Part II. Equipment Construction

625.17 Cords and Cables.

(A) Power-Supply Cord.

The cable for cord-connected electric vehicle supply equipment (EVSE) shall comply with all of the following:

(1) Be any of the types specified in 625.17(B)(1) or hard service cord, junior hard service cord, or portable power cable types in accordance with Table 400.4. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2).

(3) Have an overall length as specified in either of the following:

(4) When the interrupting device of the personnel protection system specified in 625.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

(5) For portable equipment in accordance with 625.44(A) , the power-supply cord shall be not more than 300 mm (12 in.) long.

(6) For fastened-in-place equipment in accordance with 625.44(B) , the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

(7) When the interrupting device of the personnel protection system specified in 625.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

(B) Output Cable to Electric Vehicles.

The output cable to electric vehicles shall be one of the following:

(1) Listed Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4

(2) An integral part of listed electric vehicle supply equipment

Informational Note No. 1: See UL 2594-2016, *Standard for Electric Vehicle Supply Equipment*, for information on conductive electric vehicle supply equipment.

Informational Note No. 2: See UL 2202-2009, *Standard for Electric Vehicle (EV) Charging System Equipment*, for information on conductive electric vehicle charging equipment.

(C) Overall Cord and Cable Length.

The overall usable length shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is part of the listed electric vehicle supply equipment.

(1) Portable Equipment.

For portable EVSE, the cord-exposed usable length shall be measured from the face of the attachment plug to the face of the electric vehicle connector.

(2) Fastened-in-Place.

Where the EVSE is fastened-in-place, the usable length of the output cable to the electric vehicle shall be measured from the cable exit of the electric vehicle supply equipment to the face of the electric vehicle connector.

Where the wireless power transfer equipment (WPTE) is fastened-in-place, the output cable to the primary pad shall be measured from the cable exit of the control box to the cable inlet at the primary pad.

(D) Interconnecting Cabling Systems.

Other cabling systems that are integral parts of listed EVSE and are intended to interconnect pieces of equipment within an EVSE system using approved installation methods shall be permitted.

625.22 Personnel Protection System.

EVSE shall have a listed system of protection against electric shock of personnel. Where cord-and-plug-connected equipment is used, the interrupting device of a listed personnel protection system shall be provided according to 625.17(A). A personnel protection system shall not be required for EVSE that supplies less than 60 volts dc.

Part III. Installation

625.40 Electric Vehicle Branch Circuit.

Each outlet installed for the purpose of supplying EVSE greater than 16 amperes or 120 volts shall be supplied by an individual branch circuit.

Exception: Branch circuits shall be permitted to feed multiple EVSEs as permitted by 625.42(A) or (B).

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

625.42 Rating.

The EVSE shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 625.42(A) or (B).

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load management of EVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) EVSE with Adjustable Settings.

EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer’s instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. EVSEas referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

625.43 Disconnecting Means.

For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

625.44 Equipment Connection.

EVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 625.44(A) through (C).

(A) Portable Equipment.

Portable equipment shall be connected to the premises wiring system by one or more of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes

(2) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes

(3) A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes

(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(B) Fastened-in-Place Equipment.

Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes

(2) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes

(3) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes

(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

(C) Fixed-in-Place Equipment.

All other EVSE and WPTE shall be permanently wired and fixed-in-place to the supporting surface.

625.46 Loss of Primary Source.

Means shall be provided such that, upon loss of voltage from the utility or other electrical system(s), energy cannot be back fed through the electric vehicle and the supply equipment to the premises wiring system unless permitted by 625.48.

625.47 Multiple Feeder or Branch Circuits.

Where equipment is identified for the application, more than one feeder or branch circuit shall be permitted to supply equipment.

625.48 Interactive Equipment.

EVSE or WPTE that incorporates a power export function and that is part of an interactive system that serves as an optional standby system, an electric power production source, or a bidirectional power feed shall be listed and marked as suitable for that purpose. When used as an optional standby system, the requirements of Parts I and II of Article 702 shall apply; when used as an electric power production source, the requirements of Parts I and II of Article 705 shall apply. EVPE that provides a receptacle outlet as its point of power export shall be in accordance with 625.60.

Informational Note No. 1: See UL 1741, *Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources*, for further information on supply equipment.

Informational Note No. 2: See UL 9741, *Bidirectional Electric Vehicle (EV) Charging System Equipment*, for vehicle interactive systems.

Informational Note No. 3: See SAE J3072, *Standard for Interconnection Requirements for Onboard, Utility-Interactive Inverter Systems*, for further information.

625.49 Island Mode.

EVPE and bidirectional EVSE that incorporate a power export function shall be permitted to be a part of an interconnected power system operating in island mode.

625.50 Location.

The EVSE shall be located for direct electrical coupling of the EV connector (conductive or inductive) to the electric vehicle. Unless specifically listed and marked for the location, the coupling means of the EVSE shall be stored or located at a height of not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above the grade level for outdoor locations. This requirement does not apply to portable EVSE constructed in accordance with 625.44(A).

625.52 Ventilation.

The ventilation requirement for charging an electric vehicle in an indoor enclosed space shall be determined by 625.52(A) or (B).

(A) Ventilation Not Required.

Where electric vehicle storage batteries are used or where the equipment is listed for charging electric vehicles indoors without ventilation, mechanical ventilation shall not be required.

(B) Ventilation Required.

Where the equipment is listed for charging electric vehicles that require ventilation for indoor charging, mechanical ventilation, such as a fan, shall be provided. The ventilation shall include both supply and exhaust equipment and shall be permanently installed and located to intake from, and vent directly to, the outdoors. Positive-pressure ventilation systems shall be permitted only in vehicle charging buildings or areas that have been specifically designed and approved for that application. Mechanical ventilation requirements shall be determined by one of the methods specified in 625.52(B)(1) through (B)(4).

(1) Table Values.

For supply voltages and currents specified in Table 625.52(B)(1)(1) or Table 625.52(B)(1)(2), the minimum ventilation requirements shall be as specified in Table 625.52(B)(1)(1) or Table 625.52(B)(1)(2) for each of the total number of electric vehicles that can be charged at one time.

Table 625.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m^3/min) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

	Branch-Circuit Voltage								
		Single Phase				3 Phase			
Branch-Circuit Ampere Rating	DC ≥ 50 V	120 V	208 V	240 V or 120/240 V		208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
15	0.5	1.1	1.8	2.1		—	—	—	—
20	0.6	1.4	2.4	2.8		4.2	4.8	9.7	12
30	0.9	2.1	3.6	4.2		6.3	7.2	15	18
40	1.2	2.8	4.8	5.6		8.4	9.7	19	24
50	1.5	3.5	6.1	7.0		10	12	24	30
60	1.8	4.2	7.3	8.4		13	15	29	36
100	2.9	7.0	12	14		21	24	48	60
150	—	—	—	—		31	36	73	91
200	—	—	—	—		42	48	97	120
250	—	—	—	—		52	60	120	150
300	—	—	—	—		63	73	145	180
350	—	—	—	—		73	85	170	210
400	—	—	—	—		84	97	195	240

Table 625.52(B)(1)(2) Minimum Ventilation Required in Cubic Feet per Minute (cfm) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

	Branch-Circuit Voltage								
		Single Phase				3 Phase			
Branch-Circuit Ampere Rating	DC ≥ 50V	120 V	208 V	240 V or 120/240 V		208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
15	15.4	37	64	74		—	—	—	—
20	20.4	49	85	99		148	171	342	427
30	30.8	74	128	148		222	256	512	641
40	41.3	99	171	197		296	342	683	854
50	51.3	123	214	246		370	427	854	1066
60	61.7	148	256	296		444	512	1025	1281
100	102.5	246	427	493		740	854	1708	2135
150	—	—	—	—		1110	1281	2562	3203
200	—	—	—	—		1480	1708	3416	4270
250	—	—	—	—		1850	2135	4270	5338
300	—	—	—	—		2221	2562	5125	6406
350	—	—	—	—		2591	2989	5979	7473
400	—	—	—	—		2961	3416	6832	8541

(2) Other Values.

For supply voltages and currents other than specified in Table 625.52(B)(1)(1) or Table 625.52(B)(1)(2), the minimum ventilation requirements shall be calculated by means of the following general formulas, as applicable:

(1) Single-phase ac or dc:

$Ventilation_{single\text{-}phase\ ac\ or\ dc}$ in cubic meters per minute (m^3/min) =

 **[625.52(B)(2**

$Ventilation_{single\text{-}phase\ ac\ or\ dc}$ in cubic feet per minute (cfm) =

 **[625.52(B)(2**

(2) Three-phase ac:

$Ventilation_{3\text{-}phase}$ in cubic meters per minute (m^3/min) =

 **[625.52(B)(2**

$Ventilation_{3\text{-}phase}$ in cubic feet per minute (cfm) =

 **[625.52(B)(2**

(3) Engineered Systems.

For an equipment ventilation system designed by a person qualified to perform such calculations as an integral part of a building's total ventilation system, the minimum ventilation requirements shall be permitted to be determined in accordance with calculations specified in the engineering study.

(4) Supply Circuits.

The supply circuit to the mechanical ventilation equipment shall be electrically interlocked with the equipment and shall remain energized during the entire electric vehicle charging cycle. Equipment receptacles rated at 125 volts, single phase, 15 and 20 amperes shall be switched and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the receptacle. Equipment supplied from less than 50 volts dc shall be switched and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the equipment.

625.54 Ground-Fault Circuit-Interrupter Protection for Personnel.

All receptacles installed for the connection of electric vehicle charging shall have ground-fault circuit-interrupter protection for personnel.

625.56 Receptacle Enclosures.

All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed. An outlet box hood installed for this purpose shall be listed and shall be identified as extra duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood shall not be required to be marked extra duty.

625.60 AC Receptacle Outlets Used for EVPE.

AC receptacles installed in electric vehicles and intended to allow for connection of off-board utilization equipment shall comply with 625.60(A) through (D).

(A) Type.

The receptacle outlet shall be listed.

(B) Rating.

The receptacle outlet shall be rated 250 volts maximum, single phase 50 amperes maximum.

(C) Overcurrent Protection.

Electric vehicles provided with receptacle outlets for power export shall be provided with overcurrent protection integral to the power export system. The overcurrent protection shall have a nominal rating sufficient for the receptacle it protects. The overcurrent protection shall also be sufficiently rated for the maximum available fault current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48.

(D) GFCI Protection for Personnel.

Ground-fault circuit-interrupter protection for personnel shall be provided for all receptacles. The ground-fault circuit-interrupter indication and reset shall be installed in a readily accessible location.

Informational Note: There are various methods available to achieve ground-fault circuit-interrupter protection.

Part IV. Wireless Power Transfer Equipment

625.101 Grounding.

The primary pad base plate shall be of a nonferrous metal and shall be connected to the circuit equipment grounding conductor unless the listed WPTE employs a double-insulation system. The base plate shall be sized to match the size of the primary pad enclosure.

625.102 Installation.

(A) General.

The control pad, if included in the WPTE configuration, shall comply with 625.102(B). The primary pad shall comply with 625.102(C).

(B) Control Box.

The control box enclosure shall be suitable for the environment and shall be mounted at a height not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above grade level for outdoor locations. The control box shall be mounted in one of the following forms:

(1) Pedestal

(2) Wall or pole

(3) Building or structure

(4) Raised concrete pad

(C) Primary Pad.

The primary pad shall be installed secured to the surface or embedded in the surface of the floor with its top flush with the surface or below the surface, all per manufacturer's instructions and the following:

(1) If the primary pad is located in an area requiring snow removal, it shall not be located on or above the surface.

Exception: Where installed on private property where snow removal is done manually, the primary pad shall be permitted to be installed on or above the surface.

(2) The primary pad enclosure shall be suitable for the environment. If the primary pad is located in an area subject to severe climatic conditions (e.g., flooding), the enclosure shall be suitably rated for those conditions.

(D) Protection of Cords and Cables to the Primary Pad.

The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. If installed in conditions where drive-over could occur, the cable shall be provided with supplemental protection.

Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points. Where subject to vehicular traffic, supplemental protection shall be provided.

(E) Other Wiring Systems.

Other wiring systems and fittings specifically listed for use on the WPTE shall be permitted.

Statement of Problem and Substantiation for Public Input

Since the updates to NFPA 30A that covered such a condition were eliminated in 30A to be covered in 70, these need to be defined in 70 for the sake of the AHJ and to ensure reasonable safety at these locations.

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Public Input No. 3899-NFPA 70-2023 [New Article after 625]

Article 627 Electric Self-Propelled Vehicle Power Transfer System

Part I. General

627.1 Scope.

This article covers the electrical conductors and equipment connecting an electric self-propelled vehicle (ESV) to premises wiring for the purposes of charging, power export, or bidirectional current flow.

627.4 Voltages.

Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, 600, or 1000 volts or dc system input voltages of up to 1000 volts shall be used to supply equipment covered by this article. Output voltages to the ESV are not specified.

627.6 Listed.

Electric Self-Propelled Vehicle Supply Equipment (ESVSE) including power supply cords for the purposes of charging, power export, or bidirectional current flow shall be listed.

Part II. Equipment Construction

627.17 Cords and Cables.

(A) Power-Supply Cord.

The cable for cord-connected ESVSE shall comply with all of the following:

(1) Be any of the types specified in 627.17(B)(1) or hard service cord, junior hard service cord, or portable power cable types in accordance with Table 400.4. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2).

(3) Have an overall length as specified in either of the following:

a. When the interrupting device of the personnel protection system specified in 627.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

(i) For portable equipment in accordance with 627.44(A), the power-supply cord shall be not more than 300 mm (12 in.) long.

(ii) For fastened-in-place equipment in accordance with 627.44(B), the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a

height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

b. When the interrupting device of the personnel protection system specified in 627.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

(B) Output Cable to ESV.

The output cable to an ESV shall be one of the following:

(1) Listed Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4

(2) An integral part of listed ESVSE.

(C) Overall Cord and Cable Length.

The overall usable length shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is part of the listed ESVSE.

(1) Portable Equipment.

For portable ESVSE, the cord-exposed usable length shall be measured from the face of the attachment plug to the face of the ESV connector.

(2) Fastened-in-Place.

Where the ESVSE is fastened-in-place, the usable length of the output cable to the ESV shall be measured from the cable exit of the ESVSE to the face of the ESV connector.

Where wireless power transfer equipment (WPTE) is fastened-in-place, the output cable to the primary pad shall be measured from the cable exit of the control box to the cable inlet at the primary pad.

(D) Interconnecting Cabling Systems.

Other cabling systems that are integral parts of listed supply equipment and are intended to interconnect pieces of equipment within an ESVSE system using approved installation methods shall be permitted.

627.22 Personnel Protection System.

ESVSE shall have a listed system of protection against electric shock of personnel. Where cord-and-plug-connected equipment is used, the interrupting device of a listed personnel protection system shall be provided according to 627.17(A). A personnel protection system shall not be required for power transfer equipment that supplies less than 60 volts dc.

Part III. Installation

627.40 ESVSE Branch Circuit.

Each outlet installed for the purpose of supplying ESVSE supply equipment greater than 16 amperes, or 120 volts shall be supplied by an individual branch circuit.

Exception: Branch circuits shall be permitted to feed multiple ESVSE as permitted by 627.42(A) or (B).

627.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying ESVSE and WPTE, including bidirectional equipment, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

627.42 Rating.

The ESVSE shall have sufficient rating to supply the load served. Charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 627.42(A) or (B).

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load management of ESVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) Supply Equipment with Adjustable Settings.

Supply equipment with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. Supply equipment as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

627.43 Disconnecting Means.

For supply equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall

be lockable open in accordance with 110.25.

627.44 Equipment Connection.

ESVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 627.44(A) through (C).

(A) Portable Equipment.

Portable equipment shall be connected to the premises wiring system by one or more of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes

(2) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes

(3) A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes

(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(B) Fastened-in-Place Equipment.

Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes

(2) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes

(3) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes

(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

(C) Fixed-in-Place Equipment.

All other ESVSE and WPTE shall be permanently wired and fixed-in-place to the supporting surface.

627.46 Loss of Primary Source.

Means shall be provided such that, upon loss of voltage from the utility or other electrical

system(s), energy cannot be back fed through the ESV and the supply equipment to the premises wiring system unless permitted by 627.48.

627.47 Multiple Feeder or Branch Circuits.

Where equipment is identified for the application, more than one feeder or branch circuit shall be permitted to supply equipment.

627.48 Interactive Equipment.

ESVSE or WPTE that incorporates a power export function and that is part of an interactive system that serves as an optional standby system, an electric power production source, or a bidirectional power feed shall be listed and marked as suitable for that purpose. When used as an optional standby system, the requirements of Parts I and II of Article 702 shall apply; when used as an electric power production source, the requirements of Parts I and II of Article 705 shall apply. EVPE that provides a receptacle outlet as its point of power export shall be in accordance with 627.60.

627.49 Island Mode.

ESVPE and bidirectional ESVSE that incorporate a power export function shall be permitted to be a part of an interconnected power system operating in island mode.

627.50 Location.

The ESVSE shall be located for direct electrical coupling of the ESV connector (conductive or inductive) to the ESV. Unless specifically listed and marked for the location, the coupling means of the ESV shall be stored or located at a height of not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above the grade level for outdoor locations. This requirement does not apply to portable ESVSE constructed in accordance with 627.44(A).

627.52 Ventilation.

The ventilation requirement for charging an ESV in an indoor enclosed space shall be determined by 627.52(A) or (B).

(A) Ventilation Not Required.

Where electric vehicle storage batteries are used or where the equipment is listed for charging electric vehicles indoors without ventilation, mechanical ventilation shall not be required.

(B) Ventilation Required.

Where the equipment is listed for charging electric vehicles that require ventilation for indoor charging, mechanical ventilation, such as a fan, shall be provided. The ventilation shall include

both supply and exhaust equipment and shall be permanently installed and located to intake from, and vent directly to, the outdoors. Positive-pressure ventilation systems shall be permitted only in vehicle charging buildings or areas that have been specifically designed and approved for that application. Mechanical ventilation requirements shall be determined by one of the methods specified in 627.52(B)(1) through (B)(4).

(1) Table Values.

For supply voltages and currents specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be as specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2) for each of the total number of electric vehicles that can be charged at one time.

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each of Number of ESVs That Can Be Charged at One Time

Branch-Circuit Ampere Rating	Branch-Circuit Voltage						
		Single Phase			3 Phase		
	DC				208 V or		480 V or
	≥ 50 V	120 V	208 V	240 V or 120/240 V	208Y/120 V	240 V	480Y/277 V
15	0.5	1.1	1.8	2.1	—	—	—
20	0.6	1.4	2.4	2.8	4.2	4.8	9.7
30	0.9	2.1	3.6	4.2	6.3	7.2	15
40	1.2	2.8	4.8	5.6	8.4	9.7	19
50	1.5	3.5	6.1	7.0	10	12	24
60	1.8	4.2	7.3	8.4	13	15	29
100	2.9	7.0	12	14	21	24	48
150	—	—	—	—	31	36	73
200	—	—	—	—	42	48	97
250	—	—	—	—	52	60	120
300	—	—	—	—	63	73	145
350	—	—	—	—	73	85	170
400	—	—	—	—	84	97	195

Table 627.52(B)(1)(2) Minimum Ventilation Required in Cubic Feet per Minute (cfm) for Each of the Electric Vehicles That Can Be Charged at One Time

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each

Number of ESVs That Can Be Charged at One Time

Branch-Circuit Ampere Rating	Branch-Circuit Voltage							
		Single Phase			3 Phase			
	DC			240 V or	208 V or		480 V or	
	≥ 50 V	120 V	208 V	120/240 V	208Y/120 V	240 V	480Y/277 V	
Branch-Circuit Ampere Rating	Branch-Circuit Voltage							
		Single Phase			3 Phase			
	DC			240 V or	208 V or		480 V or	600 V or
	≥ 50V	120 V	208 V	120/240 V	208Y/120 V	240 V	480Y/277 V	600Y/34
15	15.4	37	64	74	—	—	—	—
20	20.4	49	85	99	148	171	342	427
30	30.8	74	128	148	222	256	512	641
40	41.3	99	171	197	296	342	683	854
50	51.3	123	214	246	370	427	854	1066
60	61.7	148	256	296	444	512	1025	1281
100	102.5	246	427	493	740	854	1708	2135
150	—	—	—	—	1110	1281	2562	3203
200	—	—	—	—	1480	1708	3416	4270
250	—	—	—	—	1850	2135	4270	5338
300	—	—	—	—	2221	2562	5125	6406
350	—	—	—	—	2591	2989	5979	7473
400	—	—	—	—	2961	3416	6832	8541

(2) Other Values.

For supply voltages and currents other than specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be calculated by means of the following general formulas, as applicable:

(1) Single-phase ac or dc:

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(2) Three-phase ac:

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(3) Engineered Systems.

For an equipment ventilation system designed by a person qualified to perform such calculations as an integral part of a building's total ventilation system, the minimum ventilation requirements shall be permitted to be determined in accordance with calculations specified in the engineering study.

(4) Supply Circuits.

The supply circuit to the mechanical ventilation equipment shall be electrically interlocked with the equipment and shall remain energized during the entire electric vehicle charging cycle. Equipment receptacles rated at 125 volts, single phase, 15 and 20 amperes shall be switched, and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the receptacle. Equipment supplied from less than 50 volts dc shall be switched and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the equipment.

627.54 Ground-Fault Circuit-Interrupter Protection for Personnel.

All receptacles installed for the connection of ESVSE shall have ground-fault circuit-interrupter protection for personnel.

627.56 Receptacle Enclosures.

All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed. An outlet box hood installed for this purpose shall be listed and shall be identified as extra duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood shall not be required to be marked extra duty.

Part IV. Wireless Power Transfer Equipment

627.101 Grounding.

The primary pad base plate shall be of a nonferrous metal and shall be connected to the circuit equipment grounding conductor unless the listed WPTE employs a double-insulation system. The base plate shall be sized to match the size of the primary pad enclosure.

627.102 Installation.

(A) General.

The control pad, if included in the WPTE configuration, shall comply with 627.102(B). The primary pad shall comply with 627.102(C).

(B) Control Box.

The control box enclosure shall be suitable for the environment and shall be mounted at a height not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above grade level for outdoor locations. The control box shall be mounted in one of the following forms:

(1) Pedestal

(2) Wall or pole

(3) Building or structure

(4) Raised concrete pad

(C) Primary Pad.

The primary pad shall be installed secured to the surface or embedded in the surface of the floor with its top flush with the surface or below the surface, all per manufacturer's instructions and the following:

(1) If the primary pad is located in an area requiring snow removal, it shall not be located on or above the surface.

Exception: Where installed on private property where snow removal is done manually, the primary pad shall be permitted to be installed on or above the surface.

(2) The primary pad enclosure shall be suitable for the environment. If the primary pad is located in an area subject to severe climatic conditions (e.g., flooding), the enclosure shall be suitably rated for those conditions.

(D) Protection of Cords and Cables to the Primary Pad.

The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. If installed in conditions where drive-over could occur, the cable shall be provided with supplemental protection.

Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points. Where subject to vehicular traffic, supplemental protection shall be provided.

(E) Other Wiring Systems.

Other wiring systems and fittings specifically listed for use on the WPTE shall be permitted.

Additional Proposed Changes

File Name	Description	Approved
Article_627_Electric_Self-Propelled_Vehicle_Power_Transfer_System_Rev1.docx	New Article 627 in Word Format	

Statement of Problem and Substantiation for Public Input

This public input adds a new Article recognizing that the existing Article 625 only applies to an electric vehicle which is a clearly defined term that does not include many other vehicle types that are also powered by batteries. In addition to this new Article there are other new proposed definitions related to Electric Self-Propelled Electric Vehicles. This public input recognizes that the existing definition of “electric vehicle” and all associated terms including the requirements found in Article 625 is limited only to automotive-type vehicles that are used on-road and does not recognize the many other electric vehicles that the NEC should be addressing. These other electric vehicles include but are not limited to electric forklifts, electric ground support equipment found at airports, electric tractor and other similar construction equipment, golf carts, and electric boats and electric ferries. This definition uses the term “Self-Propelled Vehicle” as that term is already used in the informational note to the defined terms “electric vehicle” and “garage” and provides a more generic approach to categorize the many other types of electric vehicles.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3894-NFPA 70-2023 [New Definition after Definition: Electric Power Production ...]	
Public Input No. 3893-NFPA 70-2023 [New Definition after Definition: Electric Power Production ...]	
Public Input No. 3887-NFPA 70-2023 [New Definition after Definition: Electric Power Production ...]	

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Article 627 Electric Self-Propelled Vehicle Power Transfer System

Part I. General

627.1 Scope.

This article covers the electrical conductors and equipment connecting an electric self-propelled vehicle (ESV) to premises wiring for the purposes of charging, power export, or bidirectional current flow.

627.4 Voltages.

Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, 600, or 1000 volts or dc system input voltages of up to 1000 volts shall be used to supply equipment covered by this article. Output voltages to the ESV are not specified.

627.6 Listed.

Electric Self-Propelled Vehicle Supply Equipment (ESVSE) including power supply cords for the purposes of charging, power export, or bidirectional current flow shall be listed.

Part II. Equipment Construction

627.17 Cords and Cables.

(A) Power-Supply Cord.

The cable for cord-connected ESVSE shall comply with all of the following:

(1) Be any of the types specified in 627.17(B)(1) or hard service cord, junior hard service cord, or portable power cable types in accordance with Table 400.4. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2).

(3) Have an overall length as specified in either of the following:

a. When the interrupting device of the personnel protection system specified in 627.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

(i) For portable equipment in accordance with 627.44(A), the power-supply cord shall be not more than 300 mm (12 in.) long.

(ii) For fastened-in-place equipment in accordance with 627.44(B), the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

b. When the interrupting device of the personnel protection system specified in 627.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

(B) Output Cable to ESV.
The output cable to an ESV shall be one of the following:

(1) Listed Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4

(2) An integral part of listed ESVSE.

(C) Overall Cord and Cable Length.
The overall usable length shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is part of the listed ESVSE.

(1) Portable Equipment.

For portable ESVSE, the cord-exposed usable length shall be measured from the face of the attachment plug to the face of the ESV connector.

(2) Fastened-in-Place.
Where the ESVSE is fastened-in-place, the usable length of the output cable to the ESV shall be measured from the cable exit of the ESVSE to the face of the ESV connector.

Where wireless power transfer equipment (WPTE) is fastened-in-place, the output cable to the primary pad shall be measured from the cable exit of the control box to the cable inlet at the primary pad.

(D) Interconnecting Cabling Systems.
Other cabling systems that are integral parts of listed supply equipment and are intended to interconnect pieces of equipment within an ESVSE system using approved installation methods shall be permitted.

627.22 Personnel Protection System.
ESVSE shall have a listed system of protection against electric shock of personnel. Where cord-and-plug-connected equipment is used, the interrupting device of a listed personnel protection system shall be provided according to 627.17(A). A personnel protection system shall not be required for power transfer equipment that supplies less than 60 volts dc.

Part III. Installation

627.40 ESVSE Branch Circuit.
Each outlet installed for the purpose of supplying ESVSE supply equipment greater than 16 amperes, or 120 volts shall be supplied by an individual branch circuit.

Exception: Branch circuits shall be permitted to feed multiple ESVSE as permitted by 627.42(A) or (B).

627.41 Overcurrent Protection.
Overcurrent protection for feeders and branch circuits supplying ESVSE and WPTE, including bidirectional equipment, shall be sized for continuous duty and shall have

a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

627.42 Rating.

The ESVSE shall have sufficient rating to supply the load served. Charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 627.42(A) or (B).

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load management of ESVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) Supply Equipment with Adjustable Settings.

Supply equipment with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer’s instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. Supply equipment as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

627.43 Disconnecting Means.

For supply equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

627.44 Equipment Connection.
ESVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 627.44(A) through (C).

(A) Portable Equipment.
Portable equipment shall be connected to the premises wiring system by one or more of the following methods:
(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes
(2) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes
(3) A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes
(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(B) Fastened-in-Place Equipment.
Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes
(2) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes
(3) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes
(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

(C) Fixed-in-Place Equipment.
All other ESVSE and WPTE shall be permanently wired and fixed-in-place to the supporting surface.

627.46 Loss of Primary Source.
Means shall be provided such that, upon loss of voltage from the utility or other electrical system(s), energy cannot be back fed through the ESV and the supply equipment to the premises wiring system unless permitted by 627.48.

627.47 Multiple Feeder or Branch Circuits.
Where equipment is identified for the application, more than one feeder or branch circuit shall be permitted to supply equipment.

627.48 Interactive Equipment.
ESVSE or WPTE that incorporates a power export function and that is part of an interactive system that serves as an optional standby system, an electric power production source, or a bidirectional power feed shall be listed and marked as suitable for that purpose. When used as an optional standby system, the requirements of Parts I and II of Article 702 shall apply; when used as an electric power production source, the requirements of Parts I and II of Article 705 shall apply. EVPE that provides a receptacle outlet as its point of power export shall be in accordance with 627.60.

627.49 Island Mode.
ESVPE and bidirectional ESVSE that incorporate a power export function shall be permitted to be a part of an interconnected power system operating in island mode.

627.50 Location.
The ESVSE shall be located for direct electrical coupling of the ESV connector (conductive or inductive) to the ESV. Unless specifically listed and marked for the location, the coupling means of the ESV shall be stored or located at a height of not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above the grade level for outdoor locations. This requirement does not apply to portable ESVSE constructed in accordance with 627.44(A).

627.52 Ventilation.
The ventilation requirement for charging an ESV in an indoor enclosed space shall be determined by 627.52(A) or (B).

(A) Ventilation Not Required.
Where electric vehicle storage batteries are used or where the equipment is listed for charging electric vehicles indoors without ventilation, mechanical ventilation shall not be required.

(B) Ventilation Required.
Where the equipment is listed for charging electric vehicles that require ventilation for indoor charging, mechanical ventilation, such as a fan, shall be provided. The ventilation shall include both supply and exhaust equipment and shall be permanently installed and located to intake from, and vent directly to, the outdoors. Positive-pressure ventilation systems shall be permitted only in vehicle charging buildings or areas that have been specifically designed and approved for that application. Mechanical ventilation requirements shall be determined by one of the methods specified in 627.52(B)(1) through (B)(4).

(1) Table Values.
For supply voltages and currents specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be as specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2) for each of the total number of electric vehicles that can be charged at one time.

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each of the Total Number of ESVs That Can Be Charged at One Time

	Branch-Circuit Voltage							
Branch-		Single Phase			3 Phase			
Circuit Ampere Rating	DC ≥ 50 V	120 V	208 V	240 V or 120/240 V	208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
15	0.5	1.1	1.8	2.1	—	—	—	—
20	0.6	1.4	2.4	2.8	4.2	4.8	9.7	12
30	0.9	2.1	3.6	4.2	6.3	7.2	15	18
40	1.2	2.8	4.8	5.6	8.4	9.7	19	24
50	1.5	3.5	6.1	7.0	10	12	24	30
60	1.8	4.2	7.3	8.4	13	15	29	36
100	2.9	7.0	12	14	21	24	48	60
150	—	—	—	—	31	36	73	91
200	—	—	—	—	42	48	97	120

Table 627.52(B)(1)(1) Minimum Ventilation Required in Cubic Meters per Minute (m3/min) for Each of the Total Number of ESVs That Can Be Charged at One Time

	Branch-Circuit Voltage							
		Single Phase			3 Phase			
Branch-Circuit Ampere Rating	DC ≥ 50 V	120 V	208 V	240 V or 120/240 V	208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
250	—	—	—	—	52	60	120	150
300	—	—	—	—	63	73	145	180
350	—	—	—	—	73	85	170	210
400	—	—	—	—	84	97	195	240

Table 627.52(B)(1)(2) Minimum Ventilation Required in Cubic Feet per Minute (cfm) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

	Branch-Circuit Voltage							
		Single Phase			3 Phase			
Branch-Circuit Ampere Rating	DC ≥ 50V	120 V	208 V	240 V or 120/240 V	208 V or 208Y/120 V	240 V	480 V or 480Y/277 V	600 V or 600Y/347 V
15	15.4	37	64	74	—	—	—	—
20	20.4	49	85	99	148	171	342	427
30	30.8	74	128	148	222	256	512	641
40	41.3	99	171	197	296	342	683	854
50	51.3	123	214	246	370	427	854	1066
60	61.7	148	256	296	444	512	1025	1281
100	102.5	246	427	493	740	854	1708	2135
150	—	—	—	—	1110	1281	2562	3203
200	—	—	—	—	1480	1708	3416	4270
250	—	—	—	—	1850	2135	4270	5338
300	—	—	—	—	2221	2562	5125	6406
350	—	—	—	—	2591	2989	5979	7473
400	—	—	—	—	2961	3416	6832	8541

(2) Other Values.

For supply voltages and currents other than specified in Table 627.52(B)(1)(1) or Table 627.52(B)(1)(2), the minimum ventilation requirements shall be calculated by means of the following general formulas, as applicable:

(1) Single-phase ac or dc:

$$Ventilation\ single-phase\ ac\ or\ dc\ in\ cubic\ meters\ per\ minute\ \left(\frac{m^3}{min}\right) = \frac{(volts)(amperes)}{1718}$$ [627.52(B)(2)a]

$$Ventilation\ single-phase\ ac\ or\ dc\ in\ cubic\ feet\ per\ minute\ (cfm) = \frac{(volts)(amperes)}{48.7}$$ [627.52(B)(2)b]

(2) Three-phase ac:

$$Ventilation\ 3-phase\ ac\ or\ dc\ in\ cubic\ meters\ per\ minute\ \left(\frac{m^3}{min}\right) = \frac{(1.732)(volts)(amperes)}{1718}$$ [627.52(B)(2)c]

$$Ventilation\ 3-phase\ ac\ or\ dc\ in\ cubic\ feet\ per\ minute\ (cfm) = \frac{(1.732)(volts)(amperes)}{48.7}$$ [627.52(B)(2)d]

(3) Engineered Systems.
For an equipment ventilation system designed by a person qualified to perform such calculations as an integral part of a building's total ventilation system, the minimum ventilation requirements shall be permitted to be determined in accordance with calculations specified in the engineering study.

(4) Supply Circuits.
The supply circuit to the mechanical ventilation equipment shall be electrically interlocked with the equipment and shall remain energized during the entire electric vehicle charging cycle. Equipment receptacles rated at 125 volts, single phase, 15 and 20 amperes shall be switched, and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the receptacle. Equipment supplied from less than 50 volts dc shall be switched and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the equipment.

627.54 Ground-Fault Circuit-Interrupter Protection for Personnel.
All receptacles installed for the connection of ESVSE shall have ground-fault circuit-interrupter protection for personnel.

627.56 Receptacle Enclosures.
All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed. An outlet box hood installed for this purpose shall be listed and shall be identified as extra duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood shall not be required to be marked extra duty.

Part IV. Wireless Power Transfer Equipment

627.101 Grounding.
The primary pad base plate shall be of a nonferrous metal and shall be connected to the circuit equipment grounding conductor unless the listed WPTE employs a double-insulation system. The base plate shall be sized to match the size of the primary pad enclosure.

627.102 Installation.

(A) General.
The control pad, if included in the WPTE configuration, shall comply with 627.102(B). The primary pad shall comply with 627.102(C).

(B) Control Box.
The control box enclosure shall be suitable for the environment and shall be mounted at a height not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above grade level for outdoor locations. The control box shall be mounted in one of the following forms:

(1) Pedestal
(2) Wall or pole
(3) Building or structure
(4) Raised concrete pad

(C) Primary Pad.
The primary pad shall be installed secured to the surface or embedded in the surface of the floor with its top flush with the surface or below the surface, all per manufacturer's instructions and the following:

(1) If the primary pad is located in an area requiring snow removal, it shall not be located on or above the surface.

Exception: Where installed on private property where snow removal is done manually, the primary pad shall be permitted to be installed on or above the surface.

(2) The primary pad enclosure shall be suitable for the environment. If the primary pad is located in an area subject to severe climatic conditions (e.g., flooding), the enclosure shall be suitably rated for those conditions.

(D) Protection of Cords and Cables to the Primary Pad.
The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. If installed in conditions where drive-over could occur, the cable shall be provided with supplemental protection.

Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points. Where subject to vehicular traffic, supplemental protection shall be provided.

(E) Other Wiring Systems.
Other wiring systems and fittings specifically listed for use on the WPTE shall be permitted.

Public Input No. 2803-NFPA 70-2023 [New Section after 625.1]

625.2 Listing Requirements.

Electric vehicle power transfer system equipment for the purposes of charging, power export, or bidirectional current flow shall be listed.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document when general listing requirements are covered within an article. The NEC Style Manual Section 2.2.1 Parallel Numbering Required, states that technical committees shall use the following section numbers for the same purposes within articles. The listing requirements are to be located in the .2 section.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2802-NFPA 70-2023 [Section No. 625.6]	Deleted and relocated language to the .2 section.
Public Input No. 2802-NFPA 70-2023 [Section No. 625.6]	

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Public Input No. 632-NFPA 70-2023 [New Section after 625.1]

625.2 Reconditioned Equipment

Electric Vehicle Power Transfer Equipment shall not be reconditioned.

Statement of Problem and Substantiation for Public Input

These items are not permitted to be reconditioned per the NEMA Technical Position on Reconditioned Equipment (NEMA CS 100-2020, Appendix B.1)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 634-NFPA 70-2023 [New Section after 692.1]	

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Public Input No. 1752-NFPA 70-2023 [Section No. 625.1]

625.1 Scope.

This article covers the electrical conductors and equipment connecting an electric vehicle to premises wiring for the purposes of charging, power export, or bidirectional current flow.

Informational Note No. 1: See NFPA 505-2018, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations*, for information on fire protection of industrial trucks.

Informational Note No. ~~2: See UL 2594-2016, *Electric Vehicle Supply Equipment* , for information on conductive electric vehicle supply equipment.~~

~~Informational Note No. 3: See UL 2202-2009, *Electric Vehicle Charging System Equipment* , for information on conductive electric vehicle charging equipment.~~

~~Informational Note No. 4: See UL 2750-2020, *Outline of Investigation for Wireless Power Transfer Equipment for Electric Vehicles* , for information on wireless power transfer equipment for transferring power to an electric vehicle.~~

~~Informational Note No.~~ 5: See NECA 413-2019, *Installing and Maintaining Electric Vehicle Supply Equipment (EVSE)*, for information on the procedures for installing and maintaining AC Level 1, AC Level 2, (EVSE), wireless power transfer equipment (WPTE), and fast-charging dc electric vehicle supply equipment (~~EVSE~~ DCFC).

Statement of Problem and Substantiation for Public Input

Annex A.1(a) already reference UL 2202 (DCFC), 2594 (AC EVSE), 9741 (EVPE or BiDi depending on edition), along with 2231-1&2, etc. for Article 625. While we agree with NEMA regarding their PI to delete Part II, thus possibly Annex A reference to UL 62, 1650, 2231-1&2, 2251, and possibly 2580, reference to UL 2750 (WPTE) should be moved to Annex A.1(a), per NEC Style manual 4.2.2.1, and reference to 2594 and 2202 deleted from the informational notes per NEC Style Manual 4.2.1. The current dual listings is inconsistent. Also, per NEC Style Manual 4.2.1, "General standard references for listing or certification shall only be included in Annex A" and 625.6 requires listing of such product. The 2023 NEC Style Manual was adopted by the NEC Correlating Committee in Apr. 2023, and is the "required editorial style and arrangement". Since the UL standards are used for listing, per Section 625.6, they can only be located in Annex A.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1753-NFPA 70-2023 [Part II.]	
Public Input No. 1754-NFPA 70-2023 [Section No. 625.6]	
Public Input No. 1755-NFPA 70-2023 [Section No. 625.40]	
Public Input No. 1811-NFPA 70-2023 [Section No. 750.6]	

Submitter Information Verification

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Committee:	NEC-P12

Public Input No. 4451-NFPA 70-2023 [Section No. 625.1]

625.1 Scope.

This article covers the electrical conductors and equipment connecting an electric vehicle to premises wiring for the purposes of charging, power export, or bidirectional current flow.

Informational Note No. 1: See NFPA 505-2018, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations*, for information on fire protection of industrial trucks.

Informational Note No. 2: See UL 2594-2016, *Electric Vehicle Supply Equipment*, for information on conductive electric vehicle supply equipment.

Informational Note No. 3: See UL 2202-2009, *Electric Vehicle Charging System Equipment*, for information on conductive electric vehicle charging equipment.

Informational Note No. 4: See UL 2750-2020, *Outline of Investigation for Wireless Power Transfer Equipment for Electric Vehicles*, for information on wireless power transfer equipment for transferring power to an electric vehicle.

Informational Note No. 5: See NECA 413-~~2019~~ , *Installing and Maintaining Electric Vehicle Supply Equipment (EVSE)*, for information on the procedures for installing and maintaining AC Level 1, AC Level 2, and fast-charging dc electric vehicle supply equipment (EVSE).

Statement of Problem and Substantiation for Public Input

Revised informational Note removing the date to maintain shelf life of the reference. The reference will be maintained referring to the most recently published edition of the standard.

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Public Input No. 3491-NFPA 70-2023 [Section No. 625.4]

625.4 Voltages.

Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, 600, or 1000 volts or dc system input voltages of up to 1000 volts shall be used to supply equipment covered by this article. Dc circuit system input voltages shall not exceed 600 volts on or in one- and two-family dwellings. Output voltages to the electric vehicle are not specified.

Statement of Problem and Substantiation for Public Input

Currently there is no clearly stated maximum dc voltage limit applicable to electric vehicle supply equipment input voltages in or on 1 or 2 family dwellings. As these installations are proliferating, and the equipment topologies expand to include more dc-direct equipment and dc-to-dc converters, we need to start providing appropriate safety thresholds in Article 625. These voltage limitations in this proposal are written to harmonize with the limitations now applied to dc circuits for Solar PV Systems in Article 690 and Energy Storage Systems in Article 706. The 600V dc limit for 1 and 2 family dwellings in Article 690 has provided a stable and safe Code-mandated limit for over 20 years. Expanding this tried and tested limit to other dc circuits in 1 and 2 family dwellings makes sense for installers, equipment manufacturers, and for residential safety.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1457-NFPA 70-2023 [New Part after II.]	Standardizing 1 and 2 family dwelling maximum dc circuit voltage
Public Input No. 1457-NFPA 70-2023 [New Part after II.]	

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Public Input No. 3816-NFPA 70-2023 [New Section after 625.6]

625.7 Markings

Electric vehicle supply equipment shall have permanent markings on the outside of the equipment enclosure that are visible after installation. The following markings shall be included:

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

(2) Supply voltage, number of phases, frequency, and full-load current for each incoming supply circuit.

(3) Short-circuit current rating of the electric vehicle supply equipment based on one of the following:

a. Short-circuit current rating of a listed and labeled assembly

b. Short-circuit current rating established utilizing an approved method

Informational Note: See UL 2594 , Standard Electric Vehicle Supply Equipment , for an example of an approved method.

(4) The environmental enclosure type number.

Statement of Problem and Substantiation for Public Input

In UL2594 section 62.3, the equipment is evaluated with a short-circuit test. These products are installed in public environments that are accessible and are interacted with by consumers on a regular basis. Having this information readily available on the equipment will provide the installer and inspector the ability to ensure proper and safe installation.

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Public Input No. 4394-NFPA 70-2023 [New Section after 625.6]

625.09 Qualified Persons.

(A) Installation and Commissioning. Electrical Vehicle Power Transfer System Equipment shall be installed by qualified persons.

(B) Servicing and Maintenance. The servicing and maintenance of electric vehicle power transfer systems equipment shall be performed in accordance with Section 110.17.

Informational Note No. 1: The term "qualified person" is specifically defined in Article 100.

Informational Note No. 2: See NECA 413, *Standard for Installing and Maintaining Electric Vehicle Supply Equipment (EVSE)* , *or other ANSI approved installation standards.*

Informational Note No. 3: The *Electric Vehicle Infrastructure Training Program (EVITP) is one example of a comprehensive training program designed to educate electric ians in the complex wiring of EVSE.*

Statement of Problem and Substantiation for Public Input

Electric Vehicle Power Transfer System Equipment covered by Article 625 should be installed by qualified persons.
These systems are complicated and, in most cases, requiring a greater degree of training and experience, in design, planning, installation, commissioning and programing. These systems and others require trained qualified personnel and contractors. Qualified contractors, electricians and technicians are a crucial element of safety, related to these installations and systems. The element of maintenance is also important not to overlook and referencing Section 110.17 will ensure the maintenance and servicing is also done by qualified persons.
The addition of the two informational notes will aid code users in one seeking out the new definition of Qualified Persons, and the 2nd note informs code users that there are ANSI Approved installation standards on EVSE. See companion PIs related to qualified persons.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1708-NFPA 70-2023 [New Section after 800.3]	
Public Input No. 1706-NFPA 70-2023 [New Section after 770.3]	
Public Input No. 1701-NFPA 70-2023 [New Section after 760.3]	
Public Input No. 1698-NFPA 70-2023 [New Section after 726.3]	
Public Input No. 1695-NFPA 70-2023 [New Section after 725.3]	
Public Input No. 1694-NFPA 70-2023 [New Section after 724.3]	
Public Input No. 1690-NFPA 70-2023 [New Section after 722.3]	
Public Input No. 1686-NFPA 70-2023 [New Section after 708.8]	
Public Input No. 1684-NFPA 70-2023 [New Section after 701.7]	
Public Input No. 1672-NFPA 70-2023 [New Section after 700.8]	
Public Input No. 1629-NFPA 70-2023 [New Section after 393.6]	
Public Input No. 1557-NFPA 70-2023 [Section No. 90.2(A)]	
Public Input No. 1557-NFPA 70-2023 [Section No. 90.2(A)]	
Public Input No. 1629-NFPA 70-2023 [New Section after 393.6]	

Public Input No. 1672-NFPA 70-2023 [New Section after 700.8]
Public Input No. 1684-NFPA 70-2023 [New Section after 701.7]
Public Input No. 1686-NFPA 70-2023 [New Section after 708.8]
Public Input No. 1690-NFPA 70-2023 [New Section after 722.3]
Public Input No. 1694-NFPA 70-2023 [New Section after 724.3]
Public Input No. 1695-NFPA 70-2023 [New Section after 725.3]
Public Input No. 1698-NFPA 70-2023 [New Section after 726.3]
Public Input No. 1701-NFPA 70-2023 [New Section after 760.3]
Public Input No. 1706-NFPA 70-2023 [New Section after 770.3]
Public Input No. 1708-NFPA 70-2023 [New Section after 800.3]

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Public Input No. 1754-NFPA 70-2023 [Section No. 625.6]

625.6 Listed.

Electric vehicle power transfer system equipment for the purposes of charging, power export, or bidirectional ~~current~~ power flow shall be listed.

Statement of Problem and Substantiation for Public Input

Per our PI on 625.1 and Part II, where a listing of equipment is required, it shall be listed in Annex A Table A.1(a) as noted in NEC Style Manual 4.2.1, 4.2.2.1, and 4.2.2.1.1. Ideally it would better if EVPTSE were defined as EVSE, DCFC, EVPE or WPTE, but listing those four standards in Annex A Table A.1(a) would achieve the same thing.
If 625.6 is requiring all EVPTSE to be listed, then the reference to UL 3001 and 3010 in Annex A.1(b) should be removed, as Table A.1(b) is for Equipment that does not have a listing requirement, as noted in NEC Style Manual 4.4.2.2. The 2023 NEC Style Manual was adopted by the NEC Correlating Committee in Apr. 2023 and is the required editorial style.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1752-NFPA 70-2023 [Section No. 625.1]	Both PI relate to how listing requirement standards are to be documented per the NEC Style Manual
Public Input No. 1753-NFPA 70-2023 [Part II.]	
Public Input No. 1755-NFPA 70-2023 [Section No. 625.40]	
Public Input No. 1811-NFPA 70-2023 [Section No. 750.6]	

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Public Input No. 2802-NFPA 70-2023 [Section No. 625.6]

~~**625.6** Listed.~~

~~Electric vehicle power transfer system equipment for the purposes of charging, power export, or bidirectional current flow shall be listed.~~

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document when general listing requirements are covered within an article. The NEC Style Manual Section 2.2.1 Parallel Numbering Required, states that technical committees shall use the following section numbers for the same purposes within articles. The listing requirements are to be located in the .2 section.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2803-NFPA 70-2023 [New Section after 625.1]	Deleted and relocated to . 2 section.
Public Input No. 2803-NFPA 70-2023 [New Section after 625.1]	

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Public Input No. 1364-NFPA 70-2023 [Section No. 625.17]

625.17 Cords and Cables.

(A) Power-Supply Cord.

The cable for cord-connected electric vehicle supply equipment (EVSE) shall comply with all of the following:

(1) Be any of the types specified in 625.17(B) (1) or hard service cord, junior hard service cord, or portable power cable types in accordance with Table 400.4 . Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2) .

(3) Have an overall length as specified in either of the following:

(4) When the interrupting device of the personnel protection system specified in 625.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

(5) For portable equipment in accordance with 625.44(A) , the power-supply cord shall be not more than 300 mm (12 in.) long.

(6) For fastened-in-place equipment in accordance with 625.44(B) , the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

(7) When the interrupting device of the personnel protection system specified in 625.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

(B) Output Cable to Electric Vehicles.

The output cable to electric vehicles shall be one of the following:

(1) Listed Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4

(2) An integral part of listed electric vehicle supply equipment

Informational Note No. 1: See UL 2594-2016, *Standard for Electric Vehicle Supply Equipment* , for information on conductive electric vehicle supply equipment.

Informational Note No. 2: See UL 2202-2009, *Standard for Electric Vehicle (EV) Charging System Equipment* , for information on conductive electric vehicle charging equipment.

(C) Overall Cord and Cable Length.

The overall usable length shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is part of the listed electric vehicle supply equipment.

~~**(1)** Portable Equipment.~~

~~For portable EVSE, the cord-exposed usable length shall be measured from the face of the attachment plug to the face of the electric vehicle connector.~~

~~**(2)** Fastened-in-Place.~~

~~Where the EVSE is fastened-in-place, the usable length of the output cable to the electric vehicle shall be measured from the cable exit of the electric vehicle supply equipment to the face of the electric vehicle connector.~~

~~Where the wireless power transfer equipment (WPTE) is fastened-in-place, the output cable to the primary pad shall be measured from the cable exit of the control box to the cable inlet at the primary pad.~~

~~**(D)** Interconnecting Cabling Systems.~~

~~Other cabling systems that are integral parts of listed EVSE and are intended to interconnect pieces of equipment within an EVSE system using approved installation methods shall be permitted.~~

Statement of Problem and Substantiation for Public Input

This public input deletes “Part II. Equipment Construction” in Article 625. Section 625.6 requires all electric vehicle power transfer system equipment for the purposes of charging, power export, or bidirectional current flow to be listed. Listed power transfer system equipment will include all the equipment construction features outlined in these two sections, and many more. It is not clear why the NEC includes construction criteria for cords, cables, and personal protection systems and not any of the other construction requirements outlined in UL 2594, UL 2202, and other applicable product safety standards that must be complied to obtain the required listing. This part is superfluous and adds no value to the code.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1365-NFPA 70-2023 [Section No. 625.22]	

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Public Input No. 2408-NFPA 70-2023 [Section No. 625.17(A)]

(A) Power-Supply Cord.

The ~~cable~~ power-supply cord for cord-and-plug connected electric vehicle supply equipment (EVSE) shall comply with all of the following:

(1) Power-supply cords shall be listed.

(2) Power-supply cords used in outdoor installations shall be rated for outdoor use.

(3) The cord of the power-supply cord shall:

(4) Be any of the types specified

~~in 625.17(B) (1) or hard service cord, junior hard service cord, or portable power cable types~~

(5)

(1) as extra hard usage cord or hard usage cord in accordance with Table 400.4

~~. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable,~~

(6)

(1) ,

(2) Be listed for exposure to oil

~~and~~

(7)

(1) , and

(2) Be listed for damp and wet locations if used outdoors .

(8) ~~Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2) .~~

(9) ~~Have an~~ The power-supply cord shall have an overall length as specified in either of the following:

(10) When the interrupting device of the personnel protection system specified in 625.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

(11) For portable equipment in accordance with 625.44(A) , the power-supply cord shall be not more than 300 mm (12 in.) long.

(12) For fastened-in-place equipment in accordance with 625.44(B) , the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

(13) When the interrupting device of the personnel protection system specified in 625.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

Additional Proposed Changes

File Name	Description	Approved
NFPA2026_625.17A_Clean.docx	Word document showing changes in strikethrough and underline.	

Statement of Problem and Substantiation for Public Input

Please note that the bulleting done by terraview is incorrect, the attached document shows the correct changes.

The paragraph in 625.17(A) requires revision in order to clarify the intent and to correct potential misuse of the ampacities in Tables 400.5(A)(1) and 400.5(A)(2). For clarification, the following are required: There are cord types indicated in the current item 1 (new item 2) that are not used for power supply cords and these need to be removed. A generic reference to Table 400.4 for extra hard usage and hard usage cords would be the correct way to choose a suitable cord for use in the power supply cord. The overall power supply cord shall also be listed (new item 1).

For correction, the current item 2 is removed. The previous wording referenced those tables based on ampacity and split the use of the tables on conductor sizing. The tables are actually split based on cord type and this was potentially being ignored and allowing a cord type from Table 400.5(A)(1) to be used with the ampacity values in Table 400.5(A)(2). Although this was not intended, the language implied this use. As this is an incorrect application of the tables and can lead to undersized conductors for power supply cords for products rated above 30 A, a correction was needed. This correction simply eliminates the ampacity table uses all together and relies on the end product standards to size the power supply cord appropriately. The end product standard requires that the power supply cord be rated for 125% of the current rating of the product and aligns with the code requirements without misleading table usage.

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Committee: NEC-P12

(A) Power-Supply Cord.

The ~~cable~~power-supply cord for cord-and-plug connected electric vehicle supply equipment (EVSE) shall comply with all of the following:

(1) Power-supply cords shall be listed.~~Be any of the types specified in 625.17(B)(1) or hard service cord, junior hard service cord, or portable power cable types in accordance with Table 400.4. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.~~

(2) Power-supply cords used in outdoor installations shall be rated for outdoor use.~~Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60°C (140°F) columns of Table 400.5(A)(2).~~

(3) The cord of the power-supply cord shall:

   a. Be any of the types specified as extra hard usage cord or hard usage cord in accordance with Table 400.4,

   b. Be listed for exposure to oil, and

   c. Be listed for damp and wet locations if used outdoors.

(4) The power-supply cord shall ~~H~~have an overall length as specified in either of the following:

   a. When the interrupting device of the personnel protection system specified in 625.22 is located within the enclosure of the supply equipment or charging system, the power-supply cord shall be not more than the length indicated in (i) or (ii):

      (i) For portable equipment in accordance with 625.44(A), the power-supply cord shall be not more than 300 mm (12 in.) long.

      (ii) For fastened-in-place equipment in accordance with 625.44(B), the power-supply cord shall be not more than 1.8 m (6 ft) long and the equipment shall be installed at a height that prevents the power-supply cord from contacting the floor when it is connected to the proper receptacle.

   b. When the interrupting device of the personnel protection system specified in 625.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power-supply cord, the overall cord length shall be not greater than 4.6 m (15 ft).

Public Input No. 216-NFPA 70-2023 [Section No. 625.17(B)]

(B) Output Cable to Electric Vehicles.

The output cable to electric vehicles shall be one of the following:

(1) Listed Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4

(2) An integral part of listed electric vehicle supply equipment

(3) Be any hard service cord, junior hard service cord, or portable power cable type in accordance with Table 400.4. Hard service cord, junior hard service cord, or portable power cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

Informational Note No. 1: See UL 2594-2016, *Standard for Electric Vehicle Supply Equipment*, for information on conductive electric vehicle supply equipment.

Informational Note No. 2: See UL 2202-2009, *Standard for Electric Vehicle (EV) Charging System Equipment*, for information on conductive electric vehicle charging equipment.

Statement of Problem and Substantiation for Public Input

Reuse of cables on AC cables for EV cable is currently banned, limiting opportunity to reduce component proliferation. Specialty EV cable rating offers limited options in small market. The proposed AC cables are widely used in traditional cordset/extension cords, indicating their safety for use as an EV cable.

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Submittal Date: Mon Jan 23 17:04:42 EST 2023
Committee: NEC-P12

Public Input No. 1365-NFPA 70-2023 [Section No. 625.22]

~~**625.22** Personnel Protection System.~~

~~EVSE shall have a listed system of protection against electric shock of personnel. Where cord-and-plug-connected equipment is used, the interrupting device of a listed personnel protection system shall be provided according to 625.17(A) . A personnel protection system shall not be required for EVSE that supplies less than 60 volts dc.~~

Statement of Problem and Substantiation for Public Input

This public input deletes “Part II. Equipment Construction” in Article 625. Section 625.6 requires all electric vehicle power transfer system equipment for the purposes of charging, power export, or bidirectional current flow to be listed. Listed power transfer system equipment will include all the equipment construction features outlined in these two sections, and many more. It is not clear why the NEC includes construction criteria for cords, cables, and personal protection systems and not any of the other construction requirements outlined in UL 2594, UL 2202, and other applicable product safety standards that must be complied to obtain the required listing. This part is superfluous and adds no value to the code.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1364-NFPA 70-2023 [Section No. 625.17]	

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 1366-NFPA 70-2023 [Section No. 625.40]

625.40 Electric Vehicle Branch Circuit.

Each outlet installed for the purpose of supplying ~~EVSE greater~~ electric vehicle power transfer system equipment greater than 16 amperes or 120 volts shall be supplied by an individual branch circuit.

Exception: Branch circuits shall be permitted to ~~feed multiple EVSEs~~ supply multiple electric vehicle power transfer system equipment as permitted by 625.42(A) or (B).

Statement of Problem and Substantiation for Public Input

This public input corrects terminology for accuracy and clarity. EVSE is just one type of electric vehicle power transfer system equipment recognized by this article. This editorial revision is inclusive of EVSE, WPTE, and DCFC, all considered power transfer system equipment. The term “feed” is changed to “supply” to create a more electrically-correct statement.

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Submittal Date: Tue Jul 11 12:23:10 EDT 2023
Committee: NEC-P12

Public Input No. 1755-NFPA 70-2023 [Section No. 625.40]

625.40 Electric Vehicle Branch Circuit.

Each outlet installed for the purpose of ~~supplying EVSE greater~~ connecting EV power transfer system equipment greater than 16 amperes or 120 volts shall be ~~supplied~~ connected by an individual branch circuit.

Exception: Branch circuits shall be permitted to ~~feed multiple EVSEs as~~ connect multiple EV power transfer equipment as permitted by 625.42(A) or (B).

Statement of Problem and Substantiation for Public Input

See section 705.11(C) re: interconnected sources; once we permit Bidirectional or Unidirectional Export equipment, interconnected to Services, other electric power production sources, or other EVPTS, the concept of supply becomes confusing, since the EV may be the power source or the electrical load. Therefore, we recommend that the term "supply" be replaced with "connect" as that is how a Service is defined in Article 100. Further to NEMA's input we also support the change from EVSE (AC charging), to "EV power transfer system" to cover EVSE, WPTE, Bidirectional / EVPE, and DCFC as noted in our PI-1752, PI-1753, PI-1754, although we do recommend explicitly indicating that EVPTSE include all four UL product standards.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1752-NFPA 70-2023 [Section No. 625.1]	Defines scope of section to include sources and loads.
Public Input No. 1754-NFPA 70-2023 [Section No. 625.6]	Requires listing and hopefully Table A.1(a) is revised to include BiDi or Export equipment.
Public Input No. 1756-NFPA 70-2023 [Section No. 625.41]	

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Committee: NEC-P12

Public Input No. 1026-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

Exception: If an overcurrent device is listed and marked for continuous operation at 100 percent of its current rating, and the temperature rating of conductors protected by the overcurrent device meets the requirements of 110.14(C)(1), and the assembly including the enclosure meets the requirements marked on the overcurrent device for 100 percent continuous operation, the rating of the overcurrent device shall be permitted to be not less than the sum of the maximum load of the equipment.

Statement of Problem and Substantiation for Public Input

Code Sections 210.20(A) and 215.3 include exceptions that permit the use of listed and marked 100 percent rated assemblies, including overcurrent devices, for the protection of feeders and branch circuits sized at 100% of the continuous load in lieu of 125% of the continuous load. However, 625.41 requires overcurrent protection for feeders and branch circuits supplying EVSE to be sized at 125 percent of the maximum load of the equipment. For EV applications such as DC fast charging, where a charging session is unlikely to meet the definition of a continuous load (3hrs or more), equipment and devices may be unnecessarily oversized. For example, a DC fast charging cabinet that has a rated maximum load of 722 amperes, would require a 1200 ampere rated feeder and overcurrent device based on 125 percent of the maximum load of the equipment per 625.41. In this example, a listed and marked 100% rated assembly, including the overcurrent device, would permit the electrical infrastructure to be sized at 800 amperes, rather than 1200 amperes, eliminating excess material and cost.

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Public Input No. 1195-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

Exception: In the event that an overcurrent device is officially listed and clearly labeled for continuous operation at 100 percent of its current rating, the conductors protected by the overcurrent device have a temperature rating that satisfies the stipulations of 110.14(C)(1), and the entire assembly, including the enclosure, complies with the requirements specified on the overcurrent device for 100 percent continuous operation, it is permissible for the rating of the overcurrent device to be equal to or greater than the total sum of the equipment's maximum load.

Statement of Problem and Substantiation for Public Input

While Code Sections 210.20(A) and 215.3 offer exceptions that allow the use of listed and marked 100 percent rated assemblies, including overcurrent devices, for protecting feeders and branch circuits sized at 100 percent of the continuous load instead of 125 percent, 625.41 mandates overcurrent protection for feeders and branch circuits supplying EVSE to be sized at 125 percent of the equipment's maximum load. This requirement may lead to unnecessary oversizing of equipment and devices in EV applications. Typically charging sessions are shorter than the definition of a continuous load (3 hours or more). As an illustration, an EV charging cabinet with a maximum load rating of 1021 amperes would necessitate a 1600 ampere-rated feeder and overcurrent device based on the 125 percent rule outlined in 625.41. However, using a listed and marked 100 percent rated assembly, including the overcurrent device, would allow the electrical infrastructure to be sized at 1200 amperes, reducing excess material and cost.

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Committee: NEC-P12

Public Input No. 1367-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying ~~EVSE and WPTE~~ electric vehicle power transfer system equipment , including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

Statement of Problem and Substantiation for Public Input

This public input makes the rule applicable to all types of electric vehicle power transfer systems equipment recognized by the article and not just EVSE and WPTE.

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Submittal Date: Tue Jul 11 12:27:07 EDT 2023
Committee: NEC-P12

Public Input No. 1756-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

~~Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.~~ Where a service, feeder or branch circuit connects EV power transfer system equipment, the rating of the overcurrent device shall be in accordance with 230.42(A)(1), 215.3, or 210.20(A).

Statement of Problem and Substantiation for Public Input

See NEC Style Manual clause 2.3.1, the methods of load calculation shall be in the load calculation article i.e. 625.42. See our PI on 625.42 also. We do agree with NEMA that "EVSE and WPTE" should be replaced with "EV power transfer system equipment" or an abbreviated version such as EVPTSE, and defined, to avoid confusion regarding DCFC and EVPE/BiDi. Also, see NEC Style Manual clause 4.1.4 permitting reference to a section and article and part. Those sections should not be repeated inaccurately (without exceptions) per NEC Style Manual clause 4.1.1. The 2023 NEC Style Manual was adopted by the NEC Correlating Committee in Apr 2023 and the required editorial style. Since the equipment is bidirectional we changed the term "supply" to "connect" as per PI 1755.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1755-NFPA 70-2023 [Section No. 625.40]	Changes "supply" to "connect" due to potential confusion with direction of power flow and which side is source and which is load.

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Committee: NEC-P12

Public Input No. 2336-NFPA 70-2023 [Section No. 625.41]

625.41 Circuit Sizing.

(1) Overcurrent Protection Sizing .

~~Overcurrent protection for feeders and branch circuits supplying EVSE and protective devices for EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent overcurrent protective device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.~~

~~(2) Conductor Sizing. Conductors supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall have an ampacity of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the conductors shall have an ampacity of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.~~

~~Exception: For dwelling unit optional feeder and service load calculations, the load for EVSE and WPTE, including biderctional EVSE and WPTE shall be the nameplate rating.~~

Statement of Problem and Substantiation for Public Input

This language is extracted from 625.42 and groups the requirements for circuit and overcurrent protection sizing at 125% similar to 422.13. This makes it clear for Code users that both the OCPD and conductors are calculated at 125% for circuit sizing. Adding new first level subdivision (A) and (B) to split the requirements for clarity and in accordance with the NEC style manual.
Adding exception because many building officials are requiring that the EVSE load be at 125% when performing optional load calculations for a dwelling unit. This often results in service change of a 200A service when a EVSE is added.

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Committee: NEC-P12

Public Input No. 470-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

Exception: Where the assembly, including the overcurrent devices protecting the feeder(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.

Statement of Problem and Substantiation for Public Input

Every other section in the NEC that requires a 125% continuous use factor includes an exception for 100% rated OCPD. There is no technical reason to omit the exception here. The proposed wording is copied verbatim from 215.3 Exception 1.

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Committee: NEC-P12

Public Input No. 588-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty~~. and shall have a current rating of not less than 125 percent of the maximum load of the equipment~~ . Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

Statement of Problem and Substantiation for Public Input

The existing text indicates that all feeders and branch circuits supplying EVSE must be provided with overcurrent protection sized at 125% without the common exception for 100% rated devices. Deleting this requirement still indicates that EVSE should be treated as continuous loads but gives the designers, installers, and AHJs freedom to address this need in multiple ways. This issue is much more important as we move to 100kW and larger charging equipment where 100% rated devices are commonly available.

Submitter Information Verification

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Submittal Date: Tue Apr 11 17:47:01 EDT 2023
Committee: NEC-P12

Public Input No. 589-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

Exception: Where the assembly, including the overcurrent devices protecting the circuit, 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.

Statement of Problem and Substantiation for Public Input

The existing text indicates that all feeders and branch circuits supplying EVSE must be provided with overcurrent protection sized at 125% without the common exception for 100% rated devices. Adding this exception (found in other sections of the NEC) gives the designers, installers, and AHJs freedom to address this need in multiple ways. This issue is much more important as we move to 100kW and larger charging equipment where 100% rated devices are commonly available.

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Committee: NEC-P12

Public Input No. 654-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for ~~feeders and~~ branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. ~~Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.~~

Statement of Problem and Substantiation for Public Input

As written the text for EVSE feeders does not allow for the use of OCPDs listed at 100% of their rating. This is an anomaly in the code as Article 215.2 generally recognizes the use of 100% rated OCPDs. The simple solution is to delete the "feeder" from this code requirement and let Article 215 cover it.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 744-NFPA 70-2023 [Section No. 625.41]

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE and WPTE, including bidirectional EVSE and WPTE, shall be sized for continuous duty and shall have a current rating of not less than 125 percent of the maximum load of the equipment. Where noncontinuous loads are supplied from the same feeder, the overcurrent device shall have a current rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

Exception: A Level 3 DC fast charger does not require overcurrent protection to be sized for continuous duty or 125% of the maximum equipment load.

Statement of Problem and Substantiation for Public Input

Level 3 DC fast chargers aren't expected to run for 3+ hours at max amperage continuously. They usually run for roughly 30 minutes at max load at a given time, which charges a battery from 0% to 80%. For a battery electric vehicle that does Level 3 charging between 0% and 100%, the last 20% between 80% and 100% takes roughly just as long as from 0% to 80%, which gives a total time of roughly an hour. So, the last 20% for a 0% to 100% charge doesn't count towards the duration of continuous load.

The NEC defines continuous as running at full load for 3+ hours at any given time. Abroad, the Canadian Electrical Code is more specific, defining continuous load as full load for 1+ hour within any 2-hour period or 3+ hours within any 6-hour period. Even when using the more stringent Canadian definition, a Level 3 DC fast charger still isn't a continuous load.

So, a Level 3 DC fast charger definitely is nowhere near being a continuous load. Of course, on the other hand, single-phase Level 1 (120 V AC) and single-phase Level 2 (240 V AC) charging are definitely continuous loads by a huge margin because they normally take roughly 60 and 4-10 hours respectively to charge a mid-size long-range battery electric vehicle from 0% to 100%.

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Committee: NEC-P12

Public Input No. 1368-NFPA 70-2023 [Section No. 625.42]

625.42 Rating.

~~The EVSE shall have sufficient rating to supply the load served.~~ Electric vehicle ~~charging~~ power transfer system equipment loads shall be considered to be continuous loads for the purposes of this article. Service and feeder loads shall be ~~sized~~ calculated in accordance with ~~the product ratings~~ 220.57 , unless the overall ~~rating~~ load of the installation can be limited through controls as permitted by 625.42(A) or (B).

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load management of ~~EVSE~~ electric vehicle power transfer system equipment , the maximum equipment load on ~~a~~ the service, feeder, and ~~feeder~~ branch circuit shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) EVSE with Adjustable Settings.

EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. EVSEas referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

Statement of Problem and Substantiation for Public Input

This public input corrects terminology and makes editorial revisions to add clarity to the rule:

1. The first sentence to 625.42 is deleted as the "load served" cannot be known. The load in this case is an EV. An EV cannot demand more load than the power transfer system equipment can supply. In short, the power transfer system equipment output rating is nonconsequential as long as the circuit supplying the equipment is properly rated.

2. Service and feeder loads are calculated and sized in accordance with section 220.57 which permits a default rating for power transfer equipment or the nameplate rating, whichever is larger. This part of the rule has been revised to align with this requirement in 220.57.

3. The maximum equipment load for branch circuits has been added to 625.42(A) as the exception to 625.40 indicates this allowance can be used for branch circuits supplying multiple power transfer system equipment.

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Submittal Date: Tue Jul 11 12:32:09 EDT 2023

Committee: NEC-P12

Public Input No. 1757-NFPA 70-2023 [Section No. 625.42]

625.42 ~~Rating.~~

~~The EVSE shall have sufficient rating to supply the load served. Electric vehicle charging loads~~

Load or Source Capacity.

EV power transfer system equipment loads and source capacities shall be considered to be continuous loads or source capacities for the purposes of this article. Service ~~and feeder shall be sized in accordance with the product ratings, unless the overall rating~~ , feeder and branch circuit loads and source capacities shall be calculated in accordance with the product rating as adjusted as permitted by 625.42(B), or the overall load or source capacities of the installation can be limited through controls as permitted by 625.42(A) or (B).

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load or source management of ~~EVSE~~ EV power transfer system equipment , the ~~maximum~~ calculated equipment load or source capacity on a service ~~and feeder~~ , feeder, or branch circuit shall be the maximum load or source capacity permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) ~~EVSE~~ EV power transfer system equipment with Adjustable ~~Settings~~ Ratings .

~~EVSE with~~ EV power transfer system equipment with restricted access to an ampere or power adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. ~~EVSEas~~ EV power transfer equipment as referenced shall be permitted to have ampere or power ratings that are equal to the adjusted current or power setting.

Statement of Problem and Substantiation for Public Input

While we agree with many of NEMA's public inputs, such as expanding the application from EVSE to all EV power transfer system equipment, the existence of equipment that has a lower rating (20A in / 16 A out for example) either as a fixed or adjusted rating, and lower operating voltages than anticipated by Section 220.57, which we tried correcting. Those lower ratings permit lower calculated loads even on a branch circuit (with one adjusted EVSE at 20/16 for example, or two adjusted to 20/16 acting like one adjusted to 40/32). Also, the BiDirectional equipment means load and source capacities (terminology per Article 700 Part I) need to be considered. We changed the title of the section accordingly, per NEC Style Manual clause 2.3.1 although that does not consider source capacities. Some DCFC have power limits but broad voltage limits both input (eg. 200-300 VAC) and output (500 VDC or 920 VDC class to suit premium EVs and HD EVs). So the current limit is not necessarily relevant for equipment that has a power rather than current limit.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1828-NFPA 70-2023 [Section No. 750.30(C)(1)]	
Public Input No. 1829-NFPA 70-2023 [Section No. 750.30(C) [Excluding any Sub-Sections]]	

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 4360-NFPA 70-2023 [Section No. 625.42(A)]

(A) ~~Energy~~ Power Circuit Management ~~System~~ (~~EMS~~ PCM) .

Where ~~an EMS~~ Power Circuit Management (PCM) in accordance with 750.30 provides load management of EVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the ~~EMS~~ PCM device or system . The ~~EMS~~ PCM device or system shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

Statement of Problem and Substantiation for Public Input

Activities, such as the electrification of the transportation sector and replacement of gas-fired appliance with all electric appliances, coupled with widespread adoption of on-site storage and generation, will place significant new demands on the premises wiring systems covered by the NEC. These activities are complicated by the need to facilitate this shift in energy generation, storage, and use, with an existing (and aging) infrastructure.

An emerging trend is to leverage the technology offered by “Energy Management Systems” to manage these complex electrical systems in a way that prevents overloading of the premises wiring system. These types of systems require functional reliability in order to prevent overloading of the premises wiring, as well as utility owned assets serving the facility. Energy management systems (EMS) historically have not been evaluated for functional reliability to address electrical overload.

While other PI’s may address this need for a more robust “Energy Management System”, this must co-exist with the realization that there is still a place for the traditional Energy Management devices that are not being relied upon for these functions and should not be mandated to meet functional safety requirements.

Recognizing that these existing products will continue to exist in the marketplace, a new term is needed to differentiate between the historic EMS application of energy optimization for appliance control versus electrical overload and/or grid interconnection applications where safety is paramount. With this in mind, this PI focuses on introducing the term Power Circuit Management (PCM) where functional reliability has been applied.

This PI utilizes the new term that is proposed in a Related PI (refer to “Related PI’s”) to mark the distinction between “Energy Management” and “PCM”. As described above, the requirement for this section should reflect the more robust requirements for “PCM”.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 4331-NFPA 70-2023 [New Definition after Definition: Powder Filling “q”.]	Related due to addition of new PCM definition / term
Public Input No. 4332-NFPA 70-2023 [Definition: Energy Management System (EMS).]	Related due to addition of new PCM definition / term
Public Input No. 4335-NFPA 70-2023 [Section No. 750.30]	Related due to addition of new PCM definition / term
Public Input No. 4357-NFPA 70-2023 [Section No. 220.70]	Related due to addition of new PCM definition / term

Public Input No. 4362-NFPA 70-2023 [Section No. 700.4(B)]	Related due to addition of new PCM definition / term
Public Input No. 4364-NFPA 70-2023 [Section No. 701.4(C)]	Related due to addition of new PCM definition / term
Public Input No. 4366-NFPA 70-2023 [Section No. 702.4(A)(2)]	Related due to addition of new PCM definition / term
Public Input No. 4367-NFPA 70-2023 [Section No. 705.13]	Related due to addition of new PCM definition / term
Public Input No. 4372-NFPA 70-2023 [Section No. 750.6]	Related due to addition of new PCM definition / term
Public Input No. 4331-NFPA 70-2023 [New Definition after Definition: Powder Filling “q”.]	
Public Input No. 4332-NFPA 70-2023 [Definition: Energy Management System (EMS).]	
Public Input No. 4335-NFPA 70-2023 [Section No. 750.30]	
Public Input No. 4357-NFPA 70-2023 [Section No. 220.70]	
Public Input No. 4362-NFPA 70-2023 [Section No. 700.4(B)]	
Public Input No. 4364-NFPA 70-2023 [Section No. 701.4(C)]	
Public Input No. 4366-NFPA 70-2023 [Section No. 702.4(A)(2)]	
Public Input No. 4367-NFPA 70-2023 [Section No. 705.13]	
Public Input No. 4372-NFPA 70-2023 [Section No. 750.6]	

Submitter Information Verification

Submitter Full Name: Scott Picco
Organization: UL Solutions
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Submittal Date: Thu Sep 07 12:44:17 EDT 2023
Committee: NEC-P12

Public Input No. 655-NFPA 70-2023 [Section No. 625.42(A)]

(A) Energy Management System (EMS).

Where an EMS in accordance with 750.30 provides load management of EVSE, the ~~maximum equipment load~~ EVSE load on a service and feeder shall be the ~~maximum load~~ determined by the load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

Exception: Network residing software that directs and limits EVSE output shall be permitted to be used as an Energy Management System for fleets of three or more vehicles .
The EVSE load on a service and feeder shall be the load permitted by the EMS. The EMS shall comply with all of the following:

(1) Programming shall be based on fleet modeling, including assessments of vehicle loading, travel distance, efficiency, battery degradation, and environment.

(2) The EMS shall communicate directly with EVSE and include communication failure alarm(s).

(3) Loss of EMS communication shall not result in an EVSE load greater than the load permitted by the EMS.

Statement of Problem and Substantiation for Public Input

The first sentence is revised to substitute EVSE for equipment because there could be other equipment on a service, "maximum" was deleted because all loads in the NEC are just loads and not characterized as maximum loads.

The Society of Automotive Engineers International and the Open Charge Alliance(OCA) have written communication standards that allows software residing on a data network to communicate with EVSE and limit the output energy. The medium is ethernet or wireless. The software can also receive utility demand management protocols and adjust loads accordingly. This integration creates an effective tool for addressing the impending EV load increase and the associated strain on our utility grid. International charging equipment manufacturers are all making equipment that is able to accept the OCPP protocol published by OCA. Vendors of the software can utilize real time returning EV State of Charge to determine and schedule power delivery during charging periods. The software can set charging demand limits and manage utility demand charges, thereby also limiting the needed size of the electrical system.

This integrated technology dependent approach to does not lend itself to "listing" or confinement to one integral piece of equipment, hence this exception request. It is intended for fleet applications where charging loads can be managed, and not for open public charging facilities.

Submitter Information Verification

Submitter Full Name: James Degnan
Organization: King County Metro
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Zip:	
Submittal Date:	Tue Apr 18 17:49:57 EDT 2023
Committee:	NEC-P12

Public Input No. 2689-NFPA 70-2023 [Section No. 625.42(B)]

(B) EVSE with Adjustable Settings.

EVSE with a current adjustment setting shall be permitted if restricted access to ~~an ampere adjusting means complying with~~ the adjustment setting is accomplished by at least one of the methods permitted in 750.30(C) ~~shall be permitted~~ (3) . If ~~adjustments have~~ the adjusted current setting has an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted ~~rating~~ current setting shall appear on the rating label with sufficient durability to withstand the environment involved. ~~EVSEas~~ EVSE as referenced shall be permitted to have ~~ampere ratings that are~~ a current rating that is equal to the adjusted current setting. The current adjustment setting shall be set at the time of installation and shall only be readjusted by a qualified person.

Informational Note: An example of a current adjustment setting is an EVSE that has the capability of being set to a maximum of 80 A, but is adjusted to a 40 A maximum output to match the 50 A branch circuit supplything the EVSE.

Statement of Problem and Substantiation for Public Input

Adjusting means are provided on EVSE to match the EVSE current rating to the existing branch circuit rating in order to allow installation without expensive electrical system upgrades. If an EVSE is rated for 80A but the homeowner only has a 40 A branch in the garage, the EVSE can be adjusted to become a maximum 32 A EVSE and it can be safely and correctly installed on the 40 A branch circuit in accordance with the Code. The adjusting means is set by the installer at the time of installation and is not to be readjusted, unless by a qualified person. This revision clarifies the language and intent.

Submitter Information Verification

Submitter Full Name: Seth Carlton
Organization: UL LLC
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Submittal Date: Thu Aug 24 10:17:54 EDT 2023
Committee: NEC-P12

Public Input No. 3960-NFPA 70-2023 [Section No. 625.42(B)]

(B) EVSE with Adjustable Settings.

EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If ~~adjustments~~ adjustments able to be made on the device have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, when first installed on site and the adjusted rating shall appear on ~~the rating~~ a field installed or field marked label with sufficient durability to withstand the environment involved. ~~EVSEas~~ EVSE as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

Exception: If adjustments are only able to be made via software on an owner's portable device the fied installed label is not required.

Additional Proposed Changes

File Name	Description	Approved
PI_1.docx	PI including substantiation 625.42 (B)	

Statement of Problem and Substantiation for Public Input

As written this text requires the manufacturer to print the adjusted rating on the rating label. The rating label is usually required to be affixed to the product at the time of manufacture due to listing requirements. The manufacture cannot know what adjusted rating the customer may choose for the manufactured device. Therefore, the only option to satisfy listing requirements and the requirement herein is to replace a single rating with a table or range of possible adjusted ratings. While this would show the possible ratings to which the device could be set, it does not clearly communicate the actual adjusted rating that was chosen by the installer or user.

The proposed update requires a field installed or field marked adjusted rating label to be installed in addition to the rating label that is installed by the manufacturer, if the rating is adjusted. When first installed on site, the field marked rating label would be attached to the device when it is installed, and it must show the actual adjusted rating. This proposed change would clearly communicate to inspectors and future installers the adjusted rating of the device, the adjusted rating that was used for load calculations, and the current rating of the wire installed to support the adjusted current rating of the EVSE charging device. The proposed change would improve the communication of the adjusted rating and clarify that the adjusted rating must be documented on the device after the selected rating is chosen.

However, some modern EV chargers will only be adjustable via software on an I-phone or similar and will always charge at that maximum rating or below once set appropriately. A label on the installed hardware will not be seen by whoever is setting the device via the software on the remote device (phone, pad or computer). The HMI will provide the required information. Hence, it is reasonable to allow an exception to the field installed label in that situation.

Submitter Information Verification

Submitter Full Name: Marcelo Valdes
Organization: Asea Brown Boveri Ltd. (ABB)
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State:
Zip:

Submittal Date: Wed Sep 06 11:23:05 EDT 2023
Committee: NEC-P12

NFPA Public Input Form

NOTE: All Public Input must be received by 5:00 pm EST/EDST on the published Public Input Closing Date.

For further information on the standards-making process, please contact the Codes and Standards Administration at 617-984-7249 or visit www.nfpa.org/codes.

For technical assistance, please call NFPA at 1-800-344-3555

FOR OFFICE USE ONLY

Log #:

Date Rec'd:

Date **Name** Marcelo E Valdes, PE, IEEE Fellow **Tel. No.**

Company ABB **Email**

Street Address **City** **State** **Zip**

Please indicate organization represented (if any)

1. (a) Title of NFPA Standard National Electric Code (NEC) **NFPA No. & Year** 70 / 2026

(b) Section/Paragraph 625.42

2. Public Input Recommends (check one): ☐ new text ☒ revised text ☐ deleted text

3. Proposed Text of Public Input (include proposed new or revised wording, or identification of wording to be deleted):
[Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

625 Electric Vehicle Power Transfer System

625.42(B) Rating - EVSE with Adjustable Settings:

EVSE with restricted access to an ampere adjusting means shall be permitted. If adjustments able to be made on the device have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, when first installed on site, the adjusted rating shall appear on ~~the rating~~ a field installed or field marked label with sufficient durability to withstand the environment involved. EVSE as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

Exception: If adjustments are only able to be made via software on an owner's portable device the label is not required.

4. Statement of Problem and Substantiation for Public Input: (Note: State the problem that would be resolved by your recommendation; give the specific reason for your Public Input, including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

As written this text requires the manufacturer to print the adjusted rating on the rating label. The rating label is usually required to be affixed to the product at the time of manufacture due to listing requirements. The manufacture cannot know what adjusted rating the customer may choose for the manufactured device. Therefore, the only option to satisfy listing requirements and the requirement herein is to replace a single rating with a table or range of possible adjusted ratings. While this would show the possible ratings to which the device could be set, it does not clearly communicate the actual adjusted rating that was chosen by the installer or user.

The proposed update requires a field installed or field marked adjusted rating label to be installed in addition to the rating label that is installed by the manufacturer, if the rating is adjusted. When first installed on site, the field marked rating label would be attached to the device when it is installed, and it must show the actual adjusted rating. This proposed change would clearly communicate to inspectors and future installers the adjusted rating of the device, the adjusted rating that was used for load calculations, and the current rating of the wire installed to support the adjusted current rating of the EVSE charging device. The proposed change would improve the communication of the adjusted rating and clarify that the adjusted rating must be documented on the device after the selected rating is chosen.

However, some modern EV chargers will only be adjustable via software on an I-phone or similar and will always charge at that maximum rating or below once set appropriately. A label on the installed hardware will not be seen by whoever is setting the device via the software on the remote device (phone, pad or computer). The HMI will provide the required information. Hence, it is reasonable to allow an exception to the field installed label in that situation.

5. Copyright Assignment

(a) ☒ I am the author of the text or other material (such as illustrations, graphs) proposed in the Public Input.

(b) ☐ Some or all of the text or other material proposed in this Public Input was not authored by me. Its source is as follows: (please identify which material and provide complete information on its source)

I hereby grant and assign to the NFPA all and full rights in copyright in this Public Input (including both the Proposed Text and the Statement of Problem and Substantiation). I understand that I acquire no rights in any publication of NFPA in which this Public Input in this or another similar or analogous form is used. Except to the extent that I do not have authority to make an assignment in materials that I have identified in (b) above, I hereby warrant that I am the author of this Public Input and that I have full power and authority to enter into this assignment.

Signature (Required) Marcelo E Valdes

PLEASE USE SEPARATE FORM FOR EACH PUBLIC INPUT

To: Secretary, Standards Council National Fire Protection Association
1 Batterymarch Park · Quincy, MA 02169-7471 OR
Fax to: (617) 770-3500 OR Email to: proposals_comments@nfpa.org

9/10/2023

Public Input No. 4116-NFPA 70-2023 [Section No. 625.42(B)]

(B) EVSE with Adjustable Settings.

EVSE with restricted access to an ampere adjusting means complying with 750.30(C)(3) shall be permitted. ~~If adjustments have an impact on the rating label, those~~ When adjustments are made to the EVSE output current, those changes shall be in accordance with manufacturer's instructions~~, and the adjusted~~ . The adjusted output current rating shall ~~appear on the rating label with~~ be marked on a field installed label that has sufficient durability to withstand the environment involved. ~~EVSEas~~ EVSE as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

Statement of Problem and Substantiation for Public Input

As written this subdivision requires the manufacturer to print the adjusted rating on the rating label. The rating label is usually required to be affixed to the product at the time of manufacture due to listing requirements. From the manufacture's point-of-view, there is no way to know what adjusted rating the customer may choose for any particular unit manufactured. Therefore, the only option to satisfy listing requirements and the requirement in this subdivision is to replace a single rating with a table or range of possible adjusted ratings. While this would show the possible ratings to which the device could be set, it does not clearly communicate the actual adjusted rating that was chosen by the installer.
The proposed update requires a field marked and applied adjusted rating label to be installed in addition to the rating label that is installed by the manufacturer, if the rating is adjusted. The field marked and applied adjusted rating label would be affixed to the restricted access EVSE and it must reflect the actual, singular adjusted rating. This proposed change would clearly communicate to inspectors and future installers the adjusted rating of the device that was used for load calculations and the ampacity of the wire installed to support the adjusted current rating of the EVSE charging device. The proposed change would improve the communication of the adjusted rating and clarify that the adjusted rating must be documented on the device after the selected rating is chosen.

Submitter Information Verification

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Submittal Date: Wed Sep 06 17:03:08 EDT 2023
Committee: NEC-P12

Public Input No. 743-NFPA 70-2023 [Section No. 625.42(B)]

(B) EVSE with Adjustable Settings.

EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. ~~EVSEas~~ EVSE as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting.

Statement of Problem and Substantiation for Public Input

corrected typo

Submitter Information Verification

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Submittal Date: Wed Apr 26 04:23:32 EDT 2023
Committee: NEC-P12

Public Input No. 2337-NFPA 70-2023 [Section No. 625.42 [Excluding any Sub-Sections]]

The EVSE shall have sufficient rating to supply the load served. ~~Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article.~~ Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 625.42(A) or (B).

Statement of Problem and Substantiation for Public Input

Removed this text from here and placed in 625.41. Submitted another public input for 625.41.

Submitter Information Verification

Submitter Full Name: Mike Holt
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Submittal Date: Wed Aug 16 13:22:41 EDT 2023
Committee: NEC-P12

Public Input No. 747-NFPA 70-2023 [Section No. 625.42 [Excluding any Sub-Sections]]

The EVSE shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 625.42(A) or (B).

Exception: A Level 3 DC fast charger shall not be considered a continuous load.

Statement of Problem and Substantiation for Public Input

Level 3 DC fast chargers aren't expected to run for 3+ hours at max amperage continuously. They usually run for roughly 30 minutes at max load at a given time, which charges a battery from 0% to 80%. For a battery electric vehicle that does Level 3 charging between 0% and 100%, the last 20% between 80% and 100% takes roughly just as long as from 0% to 80%, which gives a total time of roughly an hour. So, the last 20% for a 0% to 100% charge doesn't count towards the duration of continuous load.

The NEC defines continuous as running at full load for 3+ hours at any given time. Abroad, the Canadian Electrical Code is more specific, defining continuous load as full load for 1+ hour within any 2-hour period or 3+ hours within any 6-hour period. Even when using the more stringent Canadian definition, a Level 3 DC fast charger still isn't a continuous load.

So, a Level 3 DC fast charger definitely is nowhere near being a continuous load. Of course, on the other hand, single-phase Level 1 (120 V AC) and single-phase Level 2 (240 V AC) charging are definitely continuous loads by a huge margin because they normally take roughly 60 and 4-10 hours respectively to charge a mid-size long-range battery electric vehicle from 0% to 100%.

Submitter Information Verification

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Submittal Date: Thu Apr 27 01:14:07 EDT 2023
Committee: NEC-P12

Public Input No. 1120-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

~~For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the~~ The disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a ~~plaque~~ label shall be installed on the equipment denoting the location of the disconnecting means. The marking shall meet the requirements in 110.21(B). The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

The present language requires a disconnecting means for EVSE rated more than 60 amps or more than 150 volts to ground. However, there is an equal hazard for EV equipment below these requirements. The modified language will provide for a means of disconnect within sight or lockable in the open position for all EVSE

Submitter Information Verification

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Submittal Date: Sun Jun 18 06:20:52 EDT 2023
Committee: NEC-P12

Public Input No. 1369-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For ~~EVSE and WPTE rated~~ electric vehicle power transfer system equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

This public input makes the rule applicable to all types of electric vehicle power transfer systems equipment recognized by the article and not just EVSE and WPTE.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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Submittal Date: Tue Jul 11 12:39:06 EDT 2023
Committee: NEC-P12

Public Input No. 1741-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For permanently connected EVSE and WPTE ~~rated more than 60 amperes or more than 150 volts to ground, the~~ , a disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. For cord-and-plug connected EVSE and WPTE, the cord-and-plug shall be permitted to serve as the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

All EVSE or WPTE should be provided with a disconnect device. For permanently connected products rated less than 60 A, this requirement should not be omitted. This change makes the disconnect a requirement for all permanently connected products moving forward. Cord connected products were previously omitted from this requirement entirely. However, cord connected products could be located in public areas such as apartment building or office building garages. If those products are being serviced, the disconnect device is required and should be locked out so that someone does not assume the unplugged equipment is a mistake and plug it back in while the service person is absent. In these cases, the attachment plug can be used as the disconnect device and lockable open equipment for a cord connected product is available to service persons and would meet the requirement in 110.25.

Submitter Information Verification

Submitter Full Name: Seth Carlton
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City:
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Submittal Date: Mon Jul 31 14:55:37 EDT 2023
Committee: NEC-P12

Public Input No. 1789-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For ~~EVSE and WPTE rated~~ EV power transfer system equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

We agree with NEMA that the requirement should apply equally to all EV power transfer system equipment.

Submitter Information Verification

Submitter Full Name: Kevin Cheong
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Affiliation: ChargePoint Inc.
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Submittal Date: Wed Aug 02 20:19:38 EDT 2023
Committee: NEC-P12

Public Input No. 2057-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

~~For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the~~ A readily accessible disconnecting means shall be provided ~~and installed in a readily accessible location~~ for an EVSE or WPTE . If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

This public input is being submitted on behalf of the Minnesota Department of Labor and Industry. Currently, the Department's inspection staff includes 14-office/field staff, 12-state field inspectors, 2-virtual inspectors and 50 plus contract electrical inspectors that complete over 170,000 electrical inspections annually.

The proposed language would remove the voltage and current rating of the EVSE and WPTE and require disconnects for outlets, understanding that a cord and plug connection could be deemed a disconnect. This change would also include the EVSE equipment that are allowed to be hardwired and adjusted below the 60 amps rating as permitted by 625.42 and 750.30. This disconnect and/or lockable requirement would ensure that there are provisions for locking the disconnect "off" when servicing the equipment for worker safety.

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
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Submittal Date: Fri Aug 11 13:20:58 EDT 2023
Committee: NEC-P12

Public Input No. 232-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For ~~EVSE and WPTE~~ all fixed equipment EVSE and WPTE a disconnecting means meeting the requirements of 422.31(B) shall be required. For equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

For level 2 EVSE's installed in a commercial or office parking garage the disconnecting means is not located near the EVSE. The way the article is written only equipment rated more than 60 amperes or more than 150V to ground requires a disconnect. So all 240V equipment fixed in place and listed to be permanently wired are not required to have a disconnecting means. The NEC requires all other equipment that is permanently wired to have a disconnecting means and generally it is to be readily accessible, within site of, and/or lockable.

Submitter Information Verification

Submitter Full Name: Robert Nakamichi
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Submittal Date: Fri Jan 27 23:03:46 EST 2023
Committee: NEC-P12

Public Input No. 2469-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Additional Proposed Changes

File Name	Description	Approved
Proposed_Changes_to_NFPA_70.docx	Proposed changes to NFPA 70, Article 625.43	

Statement of Problem and Substantiation for Public Input

Commercial Level 3 (aka, DC fast) electric vehicle (EV) charging stations are primarily available along major highways and are also becoming more available in public parking garages and workplace parking lots. There is a strong potential for shock hazard present at these EV charging stations because of the high voltage (400 to 1,000 V DC)/high power (≥ 50 kW) being supplied to the vehicle. Requirements for accessible emergency shutoff devices (e-stops) are necessary for the safety of first responders who respond to emergency assistance calls.

E-Stop devices are required for refueling stations per NFPA 30A but are not required for EV Charging stations per NFPA 70. Shutdown controls are required for both refueling stations and Level 3 charging stations; however, access to these shutdowns is quite different and will create unnecessary and potentially lethal intervention hazards for first responders who are called to address emergencies at Level 3 EV charging stations. Concerns are detailed below:
(1) High Voltage Energy Hazard between 400 and 1,000 volts. First responders who must operate at Level 3 EV Charging stations do so in an electrical energy environment that exceeds normal household voltages. First responders are not trained nor equipped to operate in such extreme electrical hazard areas absent a shut off or lock out device.
(2) Electrical Energy hazard is DC. First responders have no tools capable of ensuring that the DC energy hazard has been controlled. Unlike AC hazards, where tools have been made available to first responders that allow them to gather some information about the energy status of electrical equipment, there are very few tools available to first responders for ascertaining DC energy status.
(3) Some e-Stops are being installed in hazardous locations. While not required at EV charging stations, some vendors are installing e-stops. Unfortunately, they are being installed at the charging device rather than at safe locations away from the hazard area. Installation of these e-stops, while well intended, requires that first responders move into the hazard area to operate them. NFPA 30A requires that the e-stop be located at least 20 feet away from the hazard.
(4) EV Charging station electrical shut offs are not labelled and are not readily accessible. Energy disconnects (per code) are allowed to be in locked cabinets which are often not labeled. This creates confusion and frustration for first responders attempting to address the electrical hazards present. First responders will be looking for e-stops similar to what they have seen at refueling stations. E-stops have been present at refueling stations since 1984, so we have two generations of responders who are expecting them to be present.

Submitter Information Verification

Submitter Full Name: Casandra Robinson

Organization:	NUSTL
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Submittal Date:	Thu Aug 17 15:29:40 EDT 2023
Committee:	NEC-P12

Proposed changes to NFPA 70

625.43 Disconnecting Means

EV charging systems shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects.

625.43 (A) Emergency Shutoff Devices for Level 3 Charging Stations

Emergency shutoff devices or electrical disconnects for level 3 charging stations shall be installed in approved locations, but not less than 6 m (20ft) or more than 30 m (100 ft) from the electrical charging station that they serve. Where distance requires more than one emergency shutoff device or electrical disconnect, the devices shall be interconnected.

625.43 (B) Other Disconnects

For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Public Input No. 3106-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

(A) EVSE shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects and labeled with an approved sign stating "EMERGENCY ELECTRIC VEHICLE CHARGING SYSTEM SHUTOFF" or equivalent language

(B) Emergency shutoff devices or electrical disconnects shall be installed in approved locations accessible to patrons, but not less than 6 m (20 ft) or more than 30 m (100 ft) from the EVCS .

(C) Resetting from an emergency shutoff condition shall require manual intervention.

Statement of Problem and Substantiation for Public Input

This would add Emergency Stops in proper alignment with NFPA 30A

Submitter Information Verification

Submitter Full Name: Chris Pfaff
Organization: PHRT Instruction
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 29 12:08:16 EDT 2023
Committee: NEC-P12

Public Input No. 319-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Additional Proposed Changes

File Name	Description	Approved
625.43.docx	625.43	

Statement of Problem and Substantiation for Public Input

This revision will make for a safer environment for our first responders. This will be in line with 230.85.

Submitter Information Verification

Submitter Full Name: Louis Petrucci
Organization:
Street Address:
City:
State:
Zip:
Submittal Date: Thu Feb 09 13:49:17 EST 2023
Committee: NEC-P12

625.43

~~If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means~~. The disconnecting means shall be lockable open in accordance with 110.25.

Replace the above with:

The disconnecting means shall be located within site and no more than fifty (50) feet from the EVSE and WPTE. This disconnect may include a shunt-trip circuit breaker with a remote initiating device that meets the above location.

Why:

After meeting with many Rhode Island Arson Investigators I have learned about the many incidents with Lithium batteries. These batteries, along with the charging stations adding energy to this EV's when a fire breaks out will only add to the situation. With a disconnecting means in the area it will remove one of the adds to an already hazardous situation when a battery fire is involved.

This, I feel will be in line with 230.85, keeping our first responders safe.

Public Input No. 329-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For EVSE and WPTE rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Additional Proposed Changes

File Name	Description	Approved
625.43.docx	625.43 Revised	

Statement of Problem and Substantiation for Public Input

I have revised my original submittal to include dwelling units.

Submitter Information Verification

Submitter Full Name: Louis Petrucci
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Street Address:
City:
State:
Zip:
Submittal Date: Fri Feb 10 16:43:04 EST 2023
Committee: NEC-P12

625.43

~~If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means~~. The disconnecting means shall be lockable open in accordance with 110.25.

Replace the above with:

The disconnecting means shall be located within site and no more than fifty (50) feet from the EVSE and WPTE. This disconnect may include a shunt-trip circuit breaker with a remote initiating device that meets the above location.

Dwelling: Add

One and two family dwelling units that have a EV station that conforms to 625.43 that is located on the interior or exterior of the dwelling shall be provided by a disconnecting means that is equal to a disconnect or a shunt trip. This disconnect must be visible from the charging station and be within 50 feet.

EVSE that are located inside the dwelling and not visible from the exterior shall have a disconnecting means of the one described above that will be located at the entrance of the storage area where the EV is stored.

Why:

After meeting with many Rhode Island Arson Investigators I have learned about the many incidents with Lithium batteries. These batteries, along with the charging stations adding energy to this EV's when a fire breaks out will only add to the situation. With a disconnecting means in the area it will remove one of the adds to an already hazardous situation when a battery fire is involved.

This, I feel will be in line with 230.85, keeping our first responders safe.

Public Input No. 371-NFPA 70-2023 [Section No. 625.43]

625.43 Disconnecting Means.

For EVSE and WPTE rated more ~~than 60~~ than 50 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Input

N.E.C. 625.42 Rating. Three methods for EV charging referred to as Level 1, Level 2 and Level 3 EV charging explains plugging into a common grounded 120 volt electrical receptacle (NEMA 5-15R or 5-20R. Level 2 is either 240 volts or 208 volts maximum load being 32 amperes at 240 volts with a minimum circuit and overcurrent rating of 40 amperes. Accordingly, N.E.C. 625.44 (A) Portable Equipment (1), (2) and (3) shall be connected to the premises wiring system by one or more of the following methods which requires receptacles as a disconnecting means. The same is mentioned for N.E.C.624.44 (B) Fastened-in-Place Equipment (!), (2) and (3). N.E.C. 625.44 (C) Fixed-in-Place Equipment. All other EVSE and WPTE shall be permanently wired and fixed in place to the supporting surface. N.E.C. 625.43 Disconnecting Means. For equipment rated more than 60 amperes, the disconnecting means shall be provided and installed in a readily accessible location. Why is it that from 120 volts @15 amperes up to 240 volts @ 50 amperes a disconnecting means is required in the form of a plug in receptacle that is definitely within sight of the parked electric vehicle and for more than 60 amperes a disconnecting means is also required in a readily accessible location which apparently doesn't have to be within sight of the parked electric vehicle but at 60 amperes a disconnecting means is not required at all for (C) Fixed Equipment and it shall be permanently wired and fixed in place to the supporting surface? Secondly, since when is a 60 ampere rated 240 volt non fused 2 pole disconnect not considered as being part of a hard wired system? Why was 60 amperes @ 240 volts left out of the equation? All other amperages were considered! Especially , when you must wake up the on board computer within the Electric Vehicle to be able to remove the electrical connector to that vehicle, otherwise it cannot be removed.

Submitter Information Verification

Submitter Full Name: Henry Samek
Organization: South Orange
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State:
Zip:
Submittal Date: Wed Feb 22 16:32:42 EST 2023
Committee: NEC-P12

Public Input No. 1788-NFPA 70-2023 [Section No. 625.44]

625.44 Equipment Connection.

~~EVSE and WPTE shall~~ EV power transfer system equipment shall be connected to the premises wiring system in accordance with one of the methods in 625.44(A) ~~through~~ or (~~C~~ B).

(A) Portable ~~Equipment.~~

~~Portable equipment shall be connected to the premises wiring system by one~~

or

~~more of the following methods:~~

(1) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes~~

(2) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes~~

(3) ~~A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes~~

(4) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes~~

~~(B)~~

Fastened-in-Place Equipment.

~~Equipment that is fastened~~ Portable or Fastened -in-~~place~~ Place equipment shall be connected to the premises wiring system by one or more of the following methods:

(1) A nonlocking, 2-pole, 3-wire
~~grounding-type receptacle outlet rated 125 volts~~

(2) or
~~250 volts, single phase, up to 50 amperesA nonlocking,~~

(3) 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single or three phase, up to 50 amperes
~~A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated~~

(4) , or 125/250 volts, single - phase,
~~30, 50, or 60~~

(5) up to 60 amperes

(6) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(

~~C~~

B) Fixed-in-Place Equipment.

All other ~~EVSE and WPTE shall~~ EV power transfer system equipment shall be permanently wired and fixed-in-place to the supporting surface.

Statement of Problem and Substantiation for Public Input

While I'm not sure why the receptacles can't be twist-lock, I've also not seen any EVPTSE use twist-lock. It seems the existing subdivisions for portable and fastened-in-place were the same, but written differently, so for brevity and consistency it seems logical to consolidate them. We thank the TC for permitting 14-60Rs in the previous cycle, and we suggest perhaps the non-locking limitation could be removed also, which would be helpful for EVSE that may need to be ceiling mounted (in large, open, parkades), so unless there is a particular concern we're unaware of we see no reason to require them to be nonlocking.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1801-NFPA 70-2023 [Section No. 625.50]	

Submitter Information Verification

Submitter Full Name: Kevin Cheong
Organization: Chargepoint Canada Inc.
Affiliation: ChargePoint Inc.
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City:
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Submittal Date: Wed Aug 02 20:05:22 EDT 2023
Committee: NEC-P12

Public Input No. 652-NFPA 70-2023 [Section No. 625.44]

625.44 Equipment Connection.

EVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 625.44(A) through (~~C~~ B).

~~**(C)** Fixed-in-Place Equipment.~~

~~All other EVSE and WPTE shall be permanently wired and fixed-in-place to the supporting surface.~~

~~**(A)** – Portable Equipment.~~

~~Portable equipment shall be connected to the premises wiring system by one or more of the following methods:~~

(1) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes~~

(2) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes~~

(3) ~~A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes~~

(4) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes~~

~~**(B)** Fastened-in-Place Equipment.~~

~~Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:~~

(1) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes~~

(2) ~~A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes~~

(3) ~~A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes~~

(4) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes~~

Fixed-in-Place E quipment

All EVSE and WPTE shall be permanent wired and fixed in place to the supporting surface.

(B) Portable/Mobile Equipment.

Plug-and-cord connected portable/mobile EVSE equipment shall be listed as suitable for the purpose, include a personnel protection system integral to the attachment plug or located in the power supply cable within 300 mm (12”) of the attachment plug, and be no longer that 7.5 m (26”) in length

Statement of Problem and Substantiation for Public Input

Summary of Proposed Changes

Move Section C to A and strike the word “other”. Fixed-in-place equipment is the primary and preferred method for private/public EV charging indoors/outdoors.

Move Section A to B and revise wording as shown

Delete Section B Fastened-in-place Equipment

Rationale and Substantiation

Section 625.44 Equipment Connection.
Fixed-in-place Equipment

The range of fixed in place EVSE parallels the most common standard 2-pole circuit breaker ratings of 20, 30, 40, 50, 60, 80, and 100 Amps. The most common standard non-locking NEMA configurations are rated 15, 20, 30, and 50 Amps. The reclassification of “fixed in place” to “fastened in place” to allow the use of NEMA non-locking straight blade configurations for an interim connection point is problematic for a variety of reasons.

The system for EV charging at high power ratings has been engineered for use by the general public, frequently - perhaps daily, in garages (damp) and outdoor (wet) installations subject to all weather conditions. The EVSE has an embedded personnel protection system to meet these requirements and the demanding technical needs of the normal vehicle conditions of use. The primary means of providing charge energy is at home with EV specific equipment that should be hardwired, preferably with a home run, using approved wiring methods.

Introducing an interim point of connection is a misapplication of the devices, undermines the EVSE personnel protection system, creates undesirable effects, and diminishes the effectiveness of code compliance and conformity assessment. The following general rationale and substantiation is based specifically on the NEMA 14-50 configuration, is applicable to the NEMA 6-50 configuration, and to some extent the other specified configurations.

General issues of concern

Breaking under load - the conditions of use require that the receptacle be de-energized prior to inserting/removing the mating plug to avoid destructive arcing that could lead to degraded thermal performance and a potential fire hazard. Accordingly, listing requires use by a “qualified person” as defined by NEC 100.

Conditions of use - The NEMA14-50 configuration, rated IP10, is suitable for use in “dry” locations. A primary residential use has been for home electric ranges for cooking. For installation in damp or wet locations, appropriate weather protection and an accessible disconnecting means should be provided. This configuration has more recently been popularized by RV campgrounds for motor coaches in wet outdoor locations. In this application, the receptacle is in a weather protectiove NEMA 3R enclosure with a circuit breaker located directly above to disconnect and de-energize the circuit. The enclosure door and latch act to prevent partial or unintended removal of plug. Technically, the next generation of RV outlets will most likely include a Class A GFCI circuit breaker

Engagement/retention - Non-locking straight blade devices are subject to partial engagement or disconnection from unintended mechanical forces resulting in a potential shock and fire hazard. A locking/latching function would be beneficial. This is accomplished in RV applications by the enclosure cover and latching mechanism.

Neutral conductor - EVSE is a 208-240V device and does not require the neutral conductor and thus the neutral conductor is unnecessary with a NEMA14-50 device.

Overcurrent protection - Contrary to established good engineering practice of not allowing receptacles to have a higher current rating than the protective overcurrent device, the code allows an exception to the NEMA 6-50 and NEMA14-50 devices to permit use with a 40 A circuit breaker and corresponding conductor rating for special circumstances. This provides an additional possibility of misuse for EV charging applications.

Personnel protection - Recent advancements require Class A GFCI protection for wiring devices suitable for dry use when installed in “damp” (garages) and “wet” (outdoors) locations. Good policy would also require a disconnecting means accessible and in clear site, suitable weather protection, and clear instructions for safe and proper use. GFCI, weather protection, and disconnecting means increase installation cost. The technical and operational effects of class A GFCI lead to unnecessary and undesirable impacts with unintended and undesirable consequences.

EVSE Personnel Protection - Class A GFCI is a remarkable and important device that has been developed to avoid or mitigate shock hazards for both grounded and ungrounded common household appliances in damp and wet locations. Accordingly, the circuit is interrupted within 20 milliseconds if the current leakage exceeds 5 mA nominal. Normally, the allowable current leakage level for utilization equipment and appliances is 0.5 mA.

Given the electrical mass of an EV in terms of V, A, kW, and kWh and the normal conditions of use on the highways and byways in all weather conditions, Class A GFCI is not suitable for EVs. A primary requirement for connecting an EV to the grid to receive charge energy is an effective “equipment ground”. A comprehensive UL study funded by EPRI, Ford, GM, and Chrysler in the 1990s developed the available basic safety management techniques for electric vehicles. As a result, a superior personnel protection system (PPS) was developed for EVs consistent with established physiological standards. The advancements served as the basis for UL2231. The EVSE PPS is a dual function device consisting of a Ground Monitor Interrupter (GMI) and Charge Current Interrupting Device (CCID20) with auto-test on start up. With an assured low impedance ground, the allowable leakage levels and trip point can be increased while providing a superior level of personnel protection.

Adding Class A GFCI to the EVSE supply circuit will defeat the CCID/GMI system and most likely result in nuisance tripping and consumer inconvenience.

Summary, the AC EVSE was developed for permanent installation in compliance with the NEC, by a licensed electrician or knowledgable person, and inspected by the Authority Having Jurisdiction to provide safe operation over the product life. It is imperative to do it right to avoid or mitigate fire and shock hazards. Changes to allow plug-and-cord connection of EVSE that should be “hardwired” and fixed-in-place circumvents professional installation and diminishes code compliance and should be eliminated in the next code cycle. Specifying non-locking straight blade configurations in damp and wet locations defies reason and can not be substantiated.

Rationale and Substantiation

Section 625.44 Equipment Connection.
(B) Portable/mobile Equipment.

Portable/mobile plug and cord connected EVSE is a special purpose means for emergency charge access or specialized uses. In the total absence of EV charging system access, the 120V/15A plug and cord portable/mobile equipment was developed primarily for ubiquitous access to limited charge energy during the transition to EV powertrain technology and the EV charging infrastructure. The limited functional capability, especially with modern full function EVs, was recognized at the time. This has proven to be true as several full function EVs today would require several days to charge using this method.

Variants to this utilization equipment extended plug and cord connection to the broad range of non-locking 20, 30, and 50 A configurations installed for general use. The primary EV use for NEMA14-50 is to connect to RV campground outlets and provide emergency road side vehicle to vehicle charging.

Technically, specifying non-locking straight blade devices is a “design specification” (Ref Article 90) and it improperly requires devices rated for “dry locations” in damp and wet locations. The NEC installation requirements for all general purpose receptacles for all conditions of use are covered in the appropriate sections of the NEC governing premise wiring practices and devices.

Practically speaking, the circuit rating range of EVSE is from 20 to 100 A protected which is not supported by the non-locking devices. Given the conditions of use, the use of locking, safety shroud, and pin and sleeve devices with weather protective features would be a preferred solution for plug and

cord connection of portable EVSE. Available mechanical interlocks or an accessible disconnect with instructions would provide a means to avoid breaking under load. Additionally, EVSE and EV charging systems have grown in capacity to 100 A protected/80 A maximum continuous current and could use appropriate wiring devices rated 60 and 100 A for damp and wet locations to extend the capacity to all mobile/portable EVSE.

Regardless, since the plug and cord connected EVSE is not part of the premise wiring system, the appropriate place for the requirements would be the domain of product standards developed by Underwriters Laboratories and recognized standards organizations. The NEC requirements for a general purpose outlet in the other sections of the code should be applied to the installation requirements of any “general pupose” outlet.

NEC article 625 references to portable/mobile EVSE should be limited to “listed as suitable for the purpose with a personnel protection system located with 300 mm (12”) of the plug and a maximum length of 7.5 m (26’).” The product standards should consider user classification, conditions of use, and electrical characteristics. The product standards should also include compliant label instructions/warnings for the safe and proper use of the product. These changes will improve the proper use of portable/mobile EVSE and broaden the scope to meet a broader range of specialized portable EV charging needs.

As a matter of comparison, the AC vehicle inlet and charge connector has two phase contacts - L1 & L2 - for power transfer, a first-to-make last-to-break equipment ground (protective earth), a control pilot to provide current capacity, a last-to-make first-to-break proximity contact for the drivetrain interlock and to engage the dead-front function to insure no load make/break and avoid destructive arcing. A visual positive latching system with audible and tactile feedback is included to insure full engagement and prohibit unintended disconnection. The EV charge coupling has an equivalent IP65 rating for solid and liquid ingress protection.

For the hypothetical case of an EV connected using a 50A straight blade device is charging at 40A using a portable/mobile charger, by first removing the charge connector from the vehicle inlet the system is safety deenergized. Disconnecting a portable/mobile charger from the 50A straight blade non-locking plug first will result in destructive arcing that “one familiar with the construction and operation of the equipment and the hazards involved” would avoid doing.

Submitter Information Verification

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Submittal Date: Tue Apr 18 13:51:22 EDT 2023
Committee: NEC-P12

Public Input No. 822-NFPA 70-2023 [Section No. 625.44]

~~**625.44** Equipment Connection.~~

~~EVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 625.44(A) through (C).~~

~~**(A)** Portable Equipment.~~

~~Portable equipment shall be connected to the premises wiring system by one or more of the following methods:~~

(1) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes~~

(2) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes~~

(3) ~~A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes~~

(4) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes~~

~~**(B)** Fastened-in-Place Equipment.~~

~~Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:~~

(1) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes~~

(2) ~~A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes~~

(3) ~~A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes~~

(4) ~~A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes~~

~~**(C)** Fixed-in-Place Equipment.~~

~~All other EVSE and WPTE shall be permanently wired and fixed-in-place to the supporting surface.~~

Statement of Problem and Substantiation for Public Input

Leisure boat operators (who are the general public and are not commercial operators) routinely plug their boats into shore power pedestals at marinas up to light industrial 480/600 volts via cord-and-plug-connected receptacles, including locking ones, especially with large yachts. That is in a much more hazardous environment because the shock and electrocution risks are much, much higher due to naturally occurring water, especially seawater, being quite conductive. Yet, those private non-commercial non-industrial boat operators are fine. So, the choice of receptacles for EVSE and WPTE should not be limited unfairly via double standards especially when the risks of shock and electrocution on dry land are many times lower. Also, locking receptacles should definitely be allowed for EVSE and WPTE because they are safer and prevent accidental unplugging especially when the vehicle is charging. After all, the SAE J1772 or Tesla receptacles on the cars have automatic locking as a

standard safety feature. Also, locking receptacles are not so tight as to prevent the cord from being unplugged when there is excessive mechanical force. Just like fuel station hoses, they are designed to break free when a piece of equipment is pulled away from the receptacle by a vehicle driving or sailing off.

Approval to the proposed change (removal of the section) under this public input is the ideal intended goal, and the other public input merely expanding the allowance of types of receptacles up to 277 volts single phase and associated locking receptacles is just a major compromise.

Submitter Information Verification

Submitter Full Name: Conrad Ko
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Street Address:
City:
State:
Zip:
Submittal Date: Sat May 13 20:38:37 EDT 2023
Committee: NEC-P12

Public Input No. 1589-NFPA 70-2023 [New Section after 625.44(A)]

Protection from unintended or unauthorized disconnection under load.

Hot water heaters draw considerably less than EV chargers and yet with common NEMA 14-50 Installations it is possible for a child to unplug it under load or for a person to accidentally yank via tripping etc and have it pull out under load.

Also like hot water heaters there is often no indication when and if these are drawing current, plug installations should require a lockable cover like an NEMA 14-50 RV outlet (what i typically use for stated reasons does).

It is a matter of time before serious injury, death or fire occurs because of a charging cable being accidentally partially or completely unplugged. Also in regards to the Tesla provided chargers the weight of the cord pulls against its "quick change" mechanism which results in loose connections and heat I feel this also needs to be addressed.

Statement of Problem and Substantiation for Public Input

Hot water heaters draw considerably less than EV chargers and yet with common NEMA 14-50 Installations it is possible for a child to unplug it under load or for a person to accidentally yank via tripping etc and have it pull out under load.
Also like hot water heaters there is often no indication when and if these are drawing current, plug installations should require a lockable cover like an NEMA 14-50 RV outlet (what i typically use for stated reasons does).
It is a matter of time before serious injury, death or fire occurs because of a charging cable being accidentally partially or completely unplugged. Also in regards to the Tesla provided chargers the weight of the cord pulls against its "quick change" mechanism which results in loose connections and heat I feel this also needs to be addressed. Such a requirement would not create any unreasonable burden on contractors.

Submitter Information Verification

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Zip:
Submittal Date: Wed Jul 26 15:18:09 EDT 2023
Committee: NEC-P12

Public Input No. 761-NFPA 70-2023 [Sections 625.44(A), 625.44(B)]

Sections 625.44(A), 625.44(B)

(A) Portable Equipment.

Portable equipment shall be connected to the premises wiring system by one or more of the following methods:

(1) A ~~nonlocking~~ non-locking , 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts or 250 volts , single phase, 15 ~~or 20 amperes~~ , 20, 30, or 50 amperes

(2) A
~~nonlocking~~

(3) non-locking ,
~~2~~

(4) 3 -pole,
~~3~~

(5) 4 -wire grounding-type receptacle outlet rated
~~at~~

(6) at 125/ 250 volts, single - phase, 15
~~or 20~~

(7) , 20, 30, 50, or 60 amperes

(8) A ~~nonlocking~~ non-locking , 2-pole, 3-wire ~~or 3-pole, 4-wire~~ grounding-type receptacle outlet rated at ~~250 volts~~ 277 volts , single - phase, ~~30 or 50 amperes, or 125/250 volts, single-phase,~~ 15, 20, 30, or 50 ~~, or 60~~ amperes

(9) A ~~nonlocking~~ non-locking , 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(10) A horsepower-rated attachment plug and receptacle, flanged surface inlet and cord connector, or attachment plug and cord connector

(B) Fastened-in-Place Equipment.

Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:

(1) A ~~nonlocking~~ non-locking , 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes

(2) A ~~nonlocking~~ non-locking , 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to ~~50~~ 60 amperes

(3) A ~~nonlocking~~ non-locking , 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 15, 20, 30, 50, or 60 amperes

(4) A
~~nonlocking~~

(5) non-locking , 2-pole, 3-wire grounding-type receptacle outlet rated at 277 volts, single-phase, 15, 20, 30, or 50 amperes

(6) A non-locking, 3-pole, 4-wire grounding-type receptacle outlet rated at 120/208 volts, three phase, up to 60 amperes

(7) A non-locking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

(8) A horsepower-rated attachment plug and receptacle, flanged surface inlet and cord connector, or attachment plug and cord connector

Statement of Problem and Substantiation for Public Input

Non-locking was misspelled as nonlocking. Also, simplified section for portable equipment. Added support for NEMA 5-30R, 5-50R, 6-30R, 6-50R, 7-15R, 7-20R, 7-30R, 7-50R, 15-60R, 18-15R, 18-20R, 18-30R, 18-50R, and 18-60R. Most importantly, added support for extremely safe pin-and-sleeve connectors, which are suitable for even disconnecting running industrial motor loads as per 430.109(F). Furthermore, 277 volts is standard as the lower voltage and not over 300 volts as derived from a 277/480 service/feeder transformer in large commercial and all light industrial properties, so it is makes the justification for allowing 277-volt receptacles to be even stronger.

Approval to the proposed changes under this public input merely expanding the allowance of types of receptacles up to 277 volts single phase and associated locking receptacles is just a major compromise. Approval to the proposed changes under the other public input (removing the section) allowing any connection permitted by the general provisions of the Code in Chapters 1-3 is the ideal intended goal.

Submitter Information Verification

Submitter Full Name: Conrad Ko
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 02 03:41:43 EDT 2023
Committee: NEC-P12

Public Input No. 2552-NFPA 70-2023 [Sections 625.44(A), 625.44(B)]

Sections 625.44(A), 625.44(B)

(A) Portable Equipment.

Portable equipment shall be connected to the premises wiring system by one or more of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, 15 or 20 amperes

(2) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 250 volts, single phase, 15 or 20 amperes

(3) A nonlocking, 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, 30 or 50 amperes, or 125/250 volts, single-phase, 30, 50, or 60 amperes Listed and identified for EVSE and WPTE use.

(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated at 60 volts dc maximum, 15 or 20 amperes

(B) Fastened-in-Place Equipment.

Equipment that is fastened-in-place shall be connected to the premises wiring system by one of the following methods:

(1) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, up to 50 amperes

(2) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, up to 50 amperes

(3) A nonlocking, 3-pole, 4-wire grounding-type receptacle outlet rated 125/250 volts, single phase, 30, 50, or 60 amperes Listed and identified for EVSE and WPTE use.

(4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

Statement of Problem and Substantiation for Public Input

Substantiation
Electric Vehicle Supply Equipment (EVSE and WPTE) is a new and challenging application for receptacles. These receptacles should meet certain standards and be listed for the purpose of use with EVSE.

- Rated and tested for continuous load. EVSE and WPTE current draws are increasing and are often adjustable by the end-user. It is likely that end-users that do not understand the receptacle's capability will use (for example) a 48A EVSE on a 50A receptacle for charging that could exceed three hours. Designing the receptacle with this capability will prevent an unsafe condition. There have been reports of receptacles failing due to high temperatures. Root cause needs to be determined but it is believed to be caused by the EVSE being in high ambient temperatures and in use for extended time and possibly drawing more than design current. Testing needs to be developed by UL that will assure safe operating temperature and ability to function in it's intended environment over long periods of time.
- Visual identifier for dedicated EV Charging (mark "EV" on product, or similar).

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Committee: NEC-P12

Public Input No. 4396-NFPA 70-2023 [New Section after 625.44(C)]

625.45 Hazardous Locations. Electrica l vehicle supply equipment (EVSE) installed in any hazardous (classified) location shall be suitable and identified for the use and installation within that location. Equipment suitability shall be in a ccordance with Section 500.8(A).

Statement of Problem and Substantiation for Public Input

This Public Input attempts to fill a gap and correlate Article 625 with the requirements for installing EVSE within or within the vicinity of locations that classified as hazardous. There is currently no alignment or correlation between Article 625 and the chapter 5 hazardous location articles, and there should be. There are many motor fuel dispensing facilities, bulk storage facilities, commercial repair garages, and other facilities or locations where EVSE is being installed. By incorporating the requirement in Article 625, it eliminates the need for adding EVSE installation requirements or restrictions in multiple articles.

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Committee: NEC-P12

Public Input No. 1940-NFPA 70-2023 [Section No. 625.44 [Excluding any Sub-Sections]]

EVSE and WPTE shall be connected to the premises wiring system in accordance with one of the methods in 625.44(A) through (C).

Cord and plug connected equipment shall be provided with an attachment plug rated not less than 125 percent of the maximum rating of the equipment.

Statement of Problem and Substantiation for Public Input

While 625.6 requires electric vehicle power transfer system equipment to be Listed, the internet is filled with cord and plug connected EVSE that are constructed with attachment plugs that are not rated 125 percent of the EVSE rating (e.g. 48A rated EVSE with a 50A plug). UL 2594, The Standard for Electric Vehicle Supply Equipment requires the attachment plug on EVSE be rated for 125 percent of the input current rating of the device so that an EVSE with a 50A plug is limited to a 40A rating and a 48A rated cord and plug connected EVSE would be required to have a 60A rated plug. Many un-listed cord and plug connected EVSE products are available in the marketplace that are not constructed with an attachment plug rated for 125 percent of the current rating of the product that may contribute the premature failure of receptacles increasing the risk of fire.

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Committee: NEC-P12

Public Input No. 4206-NFPA 70-2023 [Section No. 625.44 [Excluding any Sub-Sections]]

EVSE and ~~WPTE shall be~~ WPTE that is connected to the premises wiring ~~system~~ shall be connected in accordance with one of the methods in 625.44(A) through (C).

Statement of Problem and Substantiation for Public Input

Current NEC doesn't allow EVSE that is not connected to premises power. There is significant interest in non-connected EVSE. More specifically, a number of startups have designed non-connected systems that include solar panels, storage, and EVSE to be installed in parking lots, driveways, etc.

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Submittal Date: Wed Sep 06 22:23:43 EDT 2023
Committee: NEC-P12

Public Input No. 1790-NFPA 70-2023 [Section No. 625.46]

625.46 Loss of Primary Source.

Means shall be provided such that, upon loss of ~~voltage from the utility or other electrical system(s), energy cannot be back fed through the electric vehicle and the supply equipment to the premises wiring system~~ one or more phases of the primary source, the electric vehicle bidirectional (or export) power equipment shall be automatically disconnected from all ungrounded conductors of the premises unless permitted by 625.48, or 625 . 49.

Statement of Problem and Substantiation for Public Input

Existing wording is not as clear as 705.40, and there will be interactive systems that are incapable of island mode, and non-interactive systems that are capable of island mode (including Ford F-150 backup power kit), so we've suggested some changes to try to make it more consistent. It is for example worthwhile considering what happens for three-phase systems that lose a phase. As previously indicated please note that UL-9741 will only consider it power export (or bidirectional power) if via the EV Connector (EV Plug e.g. SAE-J1772 or CCS1, not an L6-30P/R). The receptacles on EVs and other cars and trucks (5-15R, L6-30R, etc.) are consider vehicle-to-load (V2L), and due to inverter power quality, grounding, etc., issues are unlikely to ever be permitted to be used for interactive system use. Theoretically, with an isolation transformer, grounding, a transfer switch, and a sub-panel, more powerful V2L systems (like on an F-150 Hybrid) could be used to power a small subset of loads in the premises, but that is not considered EVPE or BiDi power according to UL-9741, just non-interactive island mode. If such a system happens to be in-use when the power goes out to the premises, there is no reason to disconnect it since the transfer switch ensures no interconnection.

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Committee: NEC-P12

Public Input No. 1370-NFPA 70-2023 [Section No. 625.48]

625.48 Interactive Equipment.

~~EVSE or WPTE that~~ Electric vehicle power transfer system equipment that incorporates a power export function and that is part of an interactive system that serves as an optional standby system, an electric power production source, or a bidirectional ~~power feed~~ current flow shall be listed and marked as suitable for that purpose. When used as an optional standby system, the requirements of Parts I and II of Article 702 shall apply; when used as an electric power production source, the requirements of Parts I and II of Article 705 shall apply. EVPE that provides a receptacle outlet as its point of power export shall be in accordance with 625.60.

Informational Note No. 1: See UL 1741, *Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources*, for further information on supply equipment.

Informational Note No. 2: See UL 9741, *Bidirectional Electric Vehicle (EV) Charging System Equipment*, for vehicle interactive systems.

Informational Note No. 3: See SAE J3072, *Standard for Interconnection Requirements for Onboard, Utility-Interactive Inverter Systems*, for further information.

Statement of Problem and Substantiation for Public Input

This public input corrects terminology for accuracy and clarity. EVSE and WPTE are just two types of electric vehicle power transfer system equipment recognized by this article. The rule should be applicable to all listed electric vehicle power transfer system equipment. The term “power feed” is changed to “current flow” to align the rule with the same terminology used in sections 625.1 and 90.2(C)(6).

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Public Input No. 1791-NFPA 70-2023 [Section No. 625.48]

625.48 Interactive Equipment.

~~EVSE or WPTE~~ EV power transfer system equipment that incorporates a power export function and that is part of an interactive system that serves as an optional standby system, an electric power production source, or a bidirectional power feed shall ~~be listed and marked~~ be marked as suitable for that purpose. When used as an optional standby system, the requirements of Parts I and II of Article 702 shall apply; when used as an electric power production source, the requirements of Parts I and II of Article 705 shall apply. ~~EVPE that provides a receptacle outlet as its point of power export shall be in accordance with 625.60 .~~

Informational Note No. 1: See ~~UL 1741, *Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources* , for further information on supply equipment.~~

~~Informational Note No. 2: See UL 9741, *Bidirectional Electric Vehicle (EV) Charging System Equipment* , for vehicle interactive systems.~~

~~Informational Note No. 3: See~~ SAE J3072, *Standard for Interconnection Requirements for Onboard, Utility-Interactive Inverter Systems*, for further information.

Statement of Problem and Substantiation for Public Input

By definition EVPE or BiDi (UL=-9741) only apply to connections via the EV Plug (eg. SAE J-1772). So, while it is possible that the optional standby system provides receptacles for plug-in loads, those receptacles, if located in the premises, will be regulated by Chapter 2 and other existing Chapters, so there is no need to mention them. We noted in the last cycle that section 625.60 is a violation of the scope of the NEC, see 90.2(D)(1), as the NEC does not regulate automotive vehicles, just the premise wiring portion, see 90.2(C)(6), and the receptacles referenced are on the vehicle and would apply to the receptacles in the bed of a Ford F-150 Hybrid, or any car or truck with a 125 V AC power outlet. Per our PI on 625.1 and 625.6 it is not permitted to require listing and indicate the product standards in informational notes, they belong in Annex A Table A.1(a) per the 2023 NEC Style Manual 4.2.1, 4.2.2.1 and 4.2.2.1.1 as adopted by the NEC Correlating Committee in Apr 2023.

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Public Input No. 1792-NFPA 70-2023 [Section No. 625.49]

625.49 Island Mode.

EVPE and bidirectional ~~EVSE that incorporate a power export function~~ EV power transfer system equipment shall be permitted to be a part of an interconnected power system operating in island mode.

Statement of Problem and Substantiation for Public Input

EVPE by definition, along with bidirectional EVPTSE, are capable of exporting power, and island mode has fewer requirements (power quality, protective relaying, etc.) than interactive systems.

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Public Input No. 1801-NFPA 70-2023 [Section No. 625.50]

625.50 Location.

The ~~EVSE shall~~ EV power transfer system equipment shall be located for direct electrical coupling of the EV connector (conductive or inductive) to the electric vehicle. Unless specifically listed and marked for the location, the coupling means of the ~~EVSE shall~~ EV power transfer system equipment shall be stored or located at a height of not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above the grade level for outdoor locations. This requirement does not apply to portable ~~EVSE constructed~~ EV power transfer system equipment constructed in accordance with 625.44(A).

Statement of Problem and Substantiation for Public Input

EVSE, DCFC, EVPE, and maybe even WPTE may theoretically all be portable, so, combined with our comments on 625.44 and those of NEMA, it is probably best to refer to EV power transfer system equipment (or EVPTSE if that is defined).

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1788-NFPA 70-2023 [Section No. 625.44]	Consolidates Portable and Fastened-in-place equipment receptacle types, but portable is still a separate category.

Submitter Information Verification

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Submittal Date: Thu Aug 03 19:54:53 EDT 2023
Committee: NEC-P12

Public Input No. 653-NFPA 70-2023 [Section No. 625.50]

625.50 Location.

The EVSE shall be located for direct electrical coupling of the EV connector (conductive or inductive) to the electric vehicle. Unless specifically listed and marked for the location, the coupling means of the EVSE shall be stored or located at a height of not less than 450 mm (18 in.) above the floor level for indoor locations or 600 mm (24 in.) above the grade level for outdoor locations. This requirement does not apply to:

(A) portable EVSE constructed in accordance with 625.44(A).

(B) Inductive charging

(C) Overhead EVSE utilizing pantograph supported conductors to connect to the top of an EV.

Statement of Problem and Substantiation for Public Input

As written the code does not recognize utilizing inductive charging or pantographs for charging of EVs, particularly transit buses. The revised text addresses this.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 1372-NFPA 70-2023 [Section No. 625.54]

625.54 Ground-Fault Circuit-Interrupter Protection for Personnel.

All receptacles installed for the connection of electric vehicle ~~charging~~ power transfer system equipment shall have ground-fault circuit-interrupter protection for personnel.

Exception: Receptacles installed in accordance with 625.44(A)(4) or 625.44(B)(4).

Statement of Problem and Substantiation for Public Input

This public input corrects terminology to align the rule with the title of the article and to properly describe the equipment used for electric vehicle power transfer. An exception is also added to provide an exception for GFCI or receptacles installed as permitted in 625.44(A)(4) and (B)(4) as Class A GFCI protection only applies to “devices intended for use on alternating current (AC) circuits of 120 V, 208Y/120 V, 120/240 V, 127 V, or 220Y/127 V, 60 Hz circuits” as indicated by UL 943.

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Submittal Date: Tue Jul 11 12:55:15 EDT 2023
Committee: NEC-P12

Public Input No. 1440-NFPA 70-2023 [Section No. 625.54]

625.54 Ground-Fault Circuit-Interrupter Protection for Personnel.

All receptacles and outlets installed for the connection of electric vehicle charging shall have ground-fault circuit-interrupter protection for personnel.

Additional Proposed Changes

File Name	Description	Approved
315522135_562375592318221_2186616584159142738_n.1688922631723_1_.jpg	Manufacturer instructions from Tesla don't specify hardwired outlets require class A protection	

Statement of Problem and Substantiation for Public Input

The problem is in the interpretation that EVSE when hardwired is required to have class A GFCI protection per 210.8(A)-(F)

Submitter Information Verification

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Submittal Date: Sun Jul 16 17:18:34 EDT 2023
Committee: NEC-P12

Public Input No. 1743-NFPA 70-2023 [Section No. 625.54]

~~**625.54** Ground-Fault Circuit-Interrupter Protection for Personnel.~~

~~All receptacles installed for the connection of electric vehicle charging shall have ground-fault circuit-interrupter protection for personnel.~~

Statement of Problem and Substantiation for Public Input

In this paragraph, the receptacles for charging an electric vehicle are referenced. These receptacles can only be located in garages as mentioned in 210.8(A)(2) and 210.8(B)(10), or outdoors as mentioned in 210.8(A)(3) and 210.8(B)(6). There are no other locations where a vehicle will be physically located for charging. Therefore, the reference does not modify 210.8 and just repeats the requirement. In accordance with 4.1.1 of the Style Manual, general requirements contained in Chapters 1 through 4 shall not be repeated in other Articles. The paragraph can be deleted.

Submitter Information Verification

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Submittal Date: Mon Jul 31 15:05:57 EDT 2023
Committee: NEC-P12

Public Input No. 1802-NFPA 70-2023 [Section No. 625.54]

625.54 Ground-Fault Circuit-Interrupter Protection for Personnel.

~~All receptacles installed for the connection of electric vehicle charging shall~~ (A) Receptacles installed for fastened-in-place EV power transfer system equipment shall not be required to have ground-fault circuit-interrupter protection for personnel if the receptacle is in a dedicated space.

Informational Note: This exception to 210.8(A) and (B) is based on 210.8(D) and TIA-23-3 and TIA Log #1748 and #1749 and intended to expire Jan. 1, 2028 with them.

(B) The outlet supplying fixed-in-place EV power transfer system equipment shall not be required to have ground-fault circuit-interrupter protection for personnel.

Statement of Problem and Substantiation for Public Input

We support NEMA's PI to create an exception for receptacles for portable and fastened in place LV DC EVPTSE. Section 210.8 already requires GFCI protection outdoors or in garages, or below grade similar uses, of all ratings in dwellings (subdivision A), and up to 50 A 1 Ph in non-dwellings (subdivisions B and F), and the NEC Style Manual indicates Chapter 2 should not be repeated (4.1.1). The "Enhanced Content" of the NFPA Link version indicates that "The outlet supplying direct-connected EVSE is not required to be GFCI protected, unless specified in the manufacturer's instructions", but this is not clear given the changes in section 210.8. In order to incorporate EVSE, WPTE, EVPE / BiDi, and DCFC more clearly it would be advantageous to use the EV power transfer system equipment terminology and make clear that fixed-in-place equipment does not require GFCI protection. See TIA-23-3, Log #1748 and #1749 for details on the incompatibility of current GFCI breakers and receptacles with modern non-linear (inverter/rectifier/switch-mode power-supply) loads. EV onboard chargers will be such non-linear loads because they have to convert line voltage AC to a higher DC battery voltage (nom. 400 VDC typ). Per our comments in our conference presentation, and its handouts, and in support of TIA Log #1748 and #1749, there is no need for GFCI protection to EV power transfer system equipment as it will already include personnel protection system equipment per UL 2231-1 and 2231-2 which includes the Dalziel Frequency Factor to improve compatibility with such non-linear equipment and reduce nuisance tripping, without compromising safety (muscular tetanization / let-go). There have been no known / confirmed shocks from EV charging, even during firefighting operations, so UL 2231 has been shown to be safe. The UL study referenced in TIA Log #1748 and #1749 acknowledge the current incompatibility of GFCI Class A with UL 101, or by inference UL 2231, despite such equipment being shown to be safe, not only theoretically, but in actual use. The NFPA Link Enhanced Content is written by experts. UL and the task group have determined that be at least five years before GFCI can be made interoperable with non-linear loads, and this will be especially difficult for EVs because on-board chargers are not required to be listed, so while UL has an on-board charger standard, there is no enforcement of it, nor is it yet compatible with the as-yet revised UL 943 standard. GFCI Class A is simply not yet ready for use in front of knowingly incompatible equipment, and in the case of EVs they may remain incompatible indefinitely.

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Committee:	NEC-P12

Public Input No. 2352-NFPA 70-2023 [Section No. 625.54]

625.54 Ground-Fault Circuit-Interrupter Protection for Personnel.

All receptacles installed for the connection of electric vehicle ~~charging~~ supply equipment shall have ground-fault circuit-interrupter protection for personnel.

Statement of Problem and Substantiation for Public Input

This requirement applies to EVSE equipment that is cord-and-plug connected via a receptacle. The term ‘electric vehicle charging’ is technically inaccurate because the charger is in the EV itself. This proposed revision will bring clarity for Code users.

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Committee: NEC-P12

Public Input No. 1373-NFPA 70-2023 [Section No. 625.56]

625.56 Receptacle Enclosures.

~~All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed. An outlet box hood installed for this purpose shall be listed and shall be identified as extra duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood shall not be required to be marked extra duty.~~

Statement of Problem and Substantiation for Public Input

This public input deletes 625.56 as the same requirements for receptacle enclosures is already found in sections 314.15 and 406.9. Section 90.3 indicates that Chapters 1-4 apply to all electrical installations, therefore repeating these requirements in Article 625 is unnecessary. This section is superfluous and adds no value to the code.

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Submittal Date: Tue Jul 11 13:03:40 EDT 2023
Committee: NEC-P12

Public Input No. 1904-NFPA 70-2023 [Section No. 625.56]

~~**625.56** Receptacle Enclosures.~~

~~All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed. An outlet box hood installed for this purpose shall be listed and shall be identified as extra duty. Other listed products, enclosures, or assemblies providing weatherproof protection that do not utilize an outlet box hood shall not be required to be marked extra duty.~~

Statement of Problem and Substantiation for Public Input

We support NEMA's PI to delete this requirement because NEC Style Manual 4.1.1 indicates general requirements contained in Ch. 1 through 4 shall not be repeated, and compliance with the Style Manual is required by the Regs (3.1.7(d), etc.) and NEC Supplemental Operating Procedure (SOP 3.3.2). The 2023 Style Manual was adopted by the NEC Correlating Committee in Apr 2023, and NEC SOP was adopted and approved by the NEC CC and SC in 2012, and all are requirements.

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Committee: NEC-P12

Public Input No. 1803-NFPA 70-2023 [Section No. 625.60]

~~**625.60** AC Receptacle Outlets Used for EVPE.~~

~~AC receptacles installed in electric vehicles and intended to allow for connection of off-board utilization equipment shall comply with 625.60(A) through (D).~~

~~**(A)** Type.~~

~~The receptacle outlet shall be listed.~~

~~**(B)** Rating.~~

~~The receptacle outlet shall be rated 250 volts maximum, single phase 50 amperes maximum.~~

~~**(C)** Overcurrent Protection.~~

~~Electric vehicles provided with receptacle outlets for power export shall be provided with overcurrent protection integral to the power export system. The overcurrent protection shall have a nominal rating sufficient for the receptacle it protects. The overcurrent protection shall also be sufficiently rated for the maximum available fault current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

~~**(D)** GFCI Protection for Personnel.~~

~~Ground-fault circuit-interrupter protection for personnel shall be provided for all receptacles. The ground-fault circuit-interrupter indication and reset shall be installed in a readily accessible location.~~

~~Informational Note: There are various methods available to achieve ground-fault circuit-interrupter protection.~~

Statement of Problem and Substantiation for Public Input

Attempting to regulate conventional receptacles installed in EVs is a violation of the TC scope, thus a Regs violation (3.3.1, 3.1.1, 3.1.7, etc.). NFPA as a whole only regulates some fuel sub-systems of vehicles, or the fire-fighting aspects of fire-fighting vehicles, and line-voltage electrical installations within recreational vehicles, mobile homes, and park trailers. Many EVs and conventional cars and trucks incorporate line-voltage receptacles and the NEC unenforceable on them. It used to be common for cigarette lighter (12 VDC) inverters to be used to power small electronics such as laptops and none of those had GFCI. By definition (UL-9741, which we're on) is via the EV Inlet / EV Plug / EV Connector, not a conventional receptacle regulated by the NEC. Also, see 90.2(C)(6) and (D)(1), the NEC should only cover the premises portion of EVPE or BiDi. Section 625.44 will already regulate the receptacle if EVPE or BiDi EVPTSE connect via a receptacle. Since the 14-60R has been permitted in the prior cycle and any 125/250 VAC connection will want to include the neutral, for 125 VAC loads, it is better to defer to 625.44 which already allows for the 125/250 connection.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1715-NFPA 70-2023 [Section No. 90.2(D)]	The scope of the NEC does not include receptacles on an EV. The anticipated eventual response is for the NEC Correlating Committee to direct CMP-12 to correct the conflict.
Public Input No. 1714-NFPA 70-2023 [Definition: Microgrid.]	Powering a portion of a building wiring system from an EV via EVPE or BiDi is a form of Microgrid.

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Committee: NEC-P12

Public Input No. 2845-NFPA 70-2023 [Section No. 625.101]

625.~~101~~ 101 Equipment Grounding Conductor .

The primary pad base plate shall be of a nonferrous metal and shall be connected to the circuit equipment grounding conductor unless the listed WPTE employs a double-insulation system. The base plate shall be sized to match the size of the primary pad enclosure.

Statement of Problem and Substantiation for Public Input

The section title must be revised to match the technical requirement. In accordance with NEC style manual section 2.1.3.2 the title must be descriptive and concise with the intent of the requirement. See 215.6 Feeder Equipment Grounding Conductor, 320.108 Equipment Grounding Conductor, 330.108 Equipment Grounding Conductor, 334.108 Equipment Grounding Conductor, 410.182 Equipment Grounding Conductor, 547.27 Separate Equipment Grounding Conductor, 555.37 Equipment Grounding Conductor, and 690.45 Size of Equipment Grounding Conductors.

Submitter Information Verification

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Submittal Date: Fri Aug 25 14:35:42 EDT 2023
Committee: NEC-P12

Public Input No. 331-NFPA 70-2023 [Section No. 625.102(D)]

(D) Protection of Cords and Cables to the Primary Pad.

The output cable to the primary pad shall be protected from physical damage and secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. ~~If installed in conditions where drive-over could occur, the cable shall be provided with supplemental protection.~~

Where there is no control box, the cord or cable supplying power to the primary pad shall be protected from physical damage and secured in place in order to restrict movement and to prevent strain at the connection points. ~~Where subject to vehicular traffic, supplemental protection shall be provided.~~

Additional Proposed Changes

File Name	Description	Approved
PI_1.pdf	625.102(D)	

Statement of Problem and Substantiation for Public Input

Substantiation-

The definition of **Wireless Power Transfer Equipment** (**WPTE**) specifically states- Equipment installed **specifically** for the purpose of transferring energy between the premises wiring and the electric ***vehicle*** without physical electrical contact. Obviously there will be no physical contact between the vehicle and the charging pad but the power supply cord or cable will be subject to electric vehicular damage if not installed underneath a concrete slab or properly protected by a heavy wall metal raceway. If WPTE is specific to electric vehicles, subsection **625.102** (**D**) part verbage - '***If installed in conditions where drive-over could occur***, ***the cable shall be provided with supplemental protection***' and '***Where subject to vehicular traffic supplemental protection shall be provided***' creates a redundancy. This should be omitted and the original protection of installation verbage, 'The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points', and 'Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points' should be revised adding 'protected from physical damage' to both parts. The original 'redundant portion' seems to be in place to specify vehicle use and empathizes protection against vehicular traffic even though the subsection is in **Article 625 Electric Vehicle Power Transfer System**. Sounds like the original protection of installation verbage was put in place to create a sense of WPTE for other equipment applications due to recent technological advancements of wireless power transfer systems external to electric vehicles. Now if the non-electric vehicle WPTE happens to be installed in an area subject to vehicular traffic for example future technologies like a WPT electric lawnmower charger, lawn care equipment, wood working equipment, island and peninsular countertops and work surfaces with integrated wireless inductive sensor spots installed in a garage, 'man cave', or workshop with indoor parking, ect., then the suggested omitted portion should stay unedited, emphasizing supplementary protection of the power supplied cord or cable but placed in a new article for general WPTE under subsection, protection of installation.

Submitter Information Verification

Submitter Full Name: Jacob Riddle
Organization: Marrs Electric

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City:	
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Submittal Date:	Fri Feb 10 20:10:40 EST 2023
Committee:	NEC-P12

Article 625 Electric Vehicle Power Transfer System

Part IV. Wireless Power Transfer Equipment

625.102. Installation.

(D) Protection of Cords and Cables to the Primary Pad.

The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. ***If installed in conditions where drive-over could occur***, ***the cable shall be provided with supplemental protection***.

Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points. ***Where subject to vehicular traffic supplemental protection shall be provided***.

100 Definitions.

Wireless Power Transfer (WPT).

The transfer of electrical energy from a power source to an electrical load via magnetic fields by a contactless means between a primary device and a secondary device. (625) (CMP-12)

Wireless Power Transfer Equipment (WPTE).

Equipment installed specifically for the purpose of transferring energy between the premises wiring and the electric ***vehicle*** without physical electrical contact. (625) (CMP-12)

Public Input Suggestions- #1,#2,#3

#1 The output cable to the primary pad shall be ***protected from physical damage*** and secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points. ~~If installed in conditions where drive-over could occur, the cable shall be provided with supplemental protection.~~

#2 Where there is no control box, the cord or cable supplying power to the primary pad shall be ***protected from physical damage*** and secured in place in order to restrict movement and to prevent strain at the connection points. W~~here subject to vehicular traffic supplemental protection shall be provided.~~

#3

-Create a new article specifically for **Wireless Power Transfer Equipment** (**WPTE**) without any mention of electric vehicles or revise definied words, **Wireless Power Transfer Equipment** (**WPTE**), to **Electric Vehicle Wireless Power Transfer Equipment** (**EVWPTE**) or revise definition of **Wireless Power Transfer Equipment** (**WPTE**) to-

Equipment installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle **or associated wireless equipment** without physical electrical contact. ~~(625)~~ (CMP-12),- articles with WPTE should mention vehicular damage and supplementary protection but in different circumstances outside of **625 Electric Vehicle Power Transfer System**.

Substantiation-

The definition of **Wireless Power Transfer Equipment** (**WPTE**) specifically states- Equipment installed **specifically** for the purpose of transferring energy between the premises wiring and the electric ***vehicle*** without physical electrical contact. Obviously there will be no physical contact between the vehicle and the charging pad but the power supply cord or cable will be subject to electric vehicular damage if not installed underneath a concrete slab or properly protected by a heavy wall metal raceway. If WPTE is specific to electric vehicles, subsection **625.102** (**D**) part verbage - '***If installed in conditions where drive-over could occur***, ***the cable shall be provided with supplemental protection***' and '***Where subject to vehicular traffic supplemental protection shall be provided***' creates a redundancy**.** This should be omitted and the original protection of installation verbage, 'The output cable to the primary pad shall be secured in place over its entire length for the purpose of restricting its movement and to prevent strain at the connection points', and 'Where there is no control box, the cord or cable supplying power to the primary pad shall be secured in place in order to restrict movement and to prevent strain at the connection points' should be revised adding 'protected from physical damage' to both parts. The original 'redundant portion' seems to be in place to specify vehicle use and empathizes protection against vehicular traffic even though the subsection is in **Article 625 Electric Vehicle Power Transfer System**. Sounds like the original protection of installation verbage was put in place to create a sense of WPTE for other equipment applications due to recent technological advancements of wireless power transfer systems external to electric vehicles. Now if the non-electric vehicle WPTE happens to be installed in an area subject to vehicular traffic for example future technologies like a WPT electric lawnmower charger, lawn care equipment, wood working equipment, island and peninsular countertops and work surfaces with integrated wireless inductive sensor spots installed in a garage, 'man cave', or workshop with indoor parking, ect., then the suggested omitted portion should stay unedited, emphasizing supplementary protection of the power supplied cord or cable but placed in a new article for general WPTE under subsection, protection of installation.

Public Input No. 3041-NFPA 70-2023 [Section No. 626.3]

626.3 Other Articles.

Wherever the requirements of other articles of this *Code* and ~~Article~~ 626 ~~differ~~ this article differ , the requirements of ~~Article~~ 626 ~~shall~~ this article shall apply. Unless electrified truck parking space wiring systems are supported or arranged in such a manner that they cannot be used in or above locations classified in 511.3 or 514.3, or both, they shall comply with 626.3(A) and (B) in addition to the requirements of this article.

(A) Vehicle Repair and Storage Facilities.

Electrified truck parking space electrical wiring systems located at facilities for the repair or storage of self-propelled vehicles that use volatile flammable liquids or flammable gases for fuel or power shall comply with Article 511.

(B) Motor Fuel Dispensing Stations.

Electrified truck parking space electrical wiring systems located at or serving motor fuel dispensing stations shall comply with Article 514.

Informational Note: See NFPA 88A-2019, *Standard for Parking Structures*, and NFPA 30A-2021, *Code for Motor Fuel Dispensing Facilities and Repair Garages*, for additional information.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article other than Article 100 or where required for context. As such, the references to Article 626 are suggested to change to "this article", to comply, but the references to Article 511 and 514 in sections A and B are suggested to stay as is for context.

Submitter Information Verification

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Submittal Date: Tue Aug 29 08:23:52 EDT 2023
Committee: NEC-P12

Public Input No. 2920-NFPA 70-2023 [Section No. 626.10]

626.10 Branch Circuits.

Electrified truck parking space single-phase branch circuits shall be derived from a ~~208Y/120-~~ single-phase 120/240 volt, 3-~~phase, 4-~~ wire

system or two ungrounded conductors from a ~~120/240-volt, single-phase, 3-wire~~ polyphase system not exceeding 240 Volts between conductors and one grounded conductor that has 120 volts to ground from either ungrounded conductor. So far as practicable, the loads shall be equally distributed on the polyphase system.

Exception: A 120-volt distribution system shall be permitted to supply existing electrified truck parking spaces.

Statement of Problem and Substantiation for Public Input

Some industrial sites have 240/120 Delta or even 5 wire 240/120 volt two phase systems. There is no technical reason to exclude these types of polyphase systems from powering single phase 120/240 electric truck parking receptacles.

Submitter Information Verification

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City:
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Submittal Date: Sun Aug 27 18:08:24 EDT 2023
Committee: NEC-P12

Public Input No. 3110-NFPA 70-2023 [Section No. 626.22(D)]

(D) Disconnecting Means.

A disconnecting switch or circuit breaker shall be provided to disconnect one or more electrified truck parking space supply equipment sites from a remote location. The disconnecting means shall be provided and installed in a readily accessible location and shall be lockable open in accordance with 110.25.

(A) EVSE shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects and labeled with an approved sign stating "EMERGENCY ELECTRIC VEHICLE CHARGING SYSTEM SHUTOFF" or equivalent language

(B) Emergency shutoff devices or electrical disconnects shall be installed in approved locations accessible to patrons, but not less than 6 m (20 ft) or more than 30 m (100 ft) from the EVCS.

(C) Resetting from an emergency shutoff condition shall require manual intervention.

Statement of Problem and Substantiation for Public Input

This would provided Emergency Stops in correlation to NFPA 30A

Submitter Information Verification

Submitter Full Name: Chris Pfaff
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Submittal Date: Tue Aug 29 12:13:43 EDT 2023
Committee: NEC-P12

Public Input No. 4480-NFPA 70-2023 [Section No. 626.30]

626.30 Transport Refrigerated Units.

Electrified truck parking spaces intended to supply transport refrigerated units (TRUs) shall include an individual branch circuit and receptacle for operation of the refrigeration/heating units. The receptacle associated with the TRUs shall be provided in addition to the receptacles required in 626.24(B).

(A) Branch Circuits.

TRU spaces shall be supplied from 208-volt, 3-phase, 240-volt, 3-phase, or 480-volt, 3-phase branch circuits and with an equipment grounding conductor.

(B) Electrified Truck Parking Space Supply Equipment.

The electrified truck parking space supply equipment, or portion thereof, providing electric power for the operation of TRUs shall be independent of the loads in Part III of Article 626.

(C) Ground-Fault Circuit-Interrupter (GFCI) Protection for Personnel .

In addition to the requirements in **210.8** , the electrified truck parking space equipment intended to supply transport refrigerated units shall be designed and constructed such that all receptacle outlets in **626.30,** supplied by branch circuits that are rated 150 volts or less to ground, 100 amperes or less, shall be provided with GFCI protection for personnel.

D) Special Purpose Ground-Fault Circuit-Interrupter (SPGFCI) Protection for Personnel .

The electrified truck parking space equipment intended to supply transport refrigerated units shall be designed and constructed such that all receptacle outlets in **626.30,** supplied by branch circuits that are rated more than 150 volts to ground, 100 amperes or less, shall be provided with SPGFCI protection for personnel.

Statement of Problem and Substantiation for Public Input

The addition of (C) is to correlate with 210.8(B)(6) for GFCI protection in outdoor applications. These receptacles and the cords that get connected to them are prone to wear and tear over time, and the outdoor environment which is inclined to become wet or damp makes the shock hazard all that more prevalent.

The addition of (D) is to accommodate the 480 V three phase applications which are common for this TRU application. Since class A GFCIs are limited to 150 V to ground or less, but shock hazards are still just as prevalent at the 480 V three phase level, Class C personnel protection should be added for those applications as well.

GFCIs and SPGFCIs are both commercially available up to 100A for the branch circuits outlined in (A) of this section.

Submitter Information Verification

Submitter Full Name: Tim Piemonte
Organization: Littelfuse

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Submittal Date:	Thu Sep 07 16:13:21 EDT 2023
Committee:	NEC-P12

Public Input No. 962-NFPA 70-2023 [Section No. 626.30]

626.30 Transport Refrigerated Units.

Electrified truck parking spaces intended to supply transport refrigerated units (TRUs) shall include an individual branch circuit ~~and receptacle for operation of the~~ with a receptacle or cord connector output to supply the refrigeration/heating units. The receptacle or cord connector associated with supplying the TRUs shall be provided in addition to the receptacles required in 626.24(B).

(A) Branch Circuits.

TRU spaces shall be supplied from 208-volt, 3-phase, 240-volt, 3-phase, or 480-volt, 3-phase branch circuits and with an equipment grounding conductor.

(B) Electrified Truck Parking Space Supply Equipment.

The electrified truck parking space supply equipment, or portion thereof, providing electric power for the operation of TRUs shall be independent of the loads in Part III of Article 626.

Statement of Problem and Substantiation for Public Input

This proposal adds an additional option for supplying electricity to TRUs. There is no safety reason to limit the supply connection to only receptacle and separable power supply cable assembly combination. Disconnect switches with integral cord and connector are readily available and can be installed to satisfy the requirements in sections 626.31(A), 626.31(B), and 626.32.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 963-NFPA 70-2023 [Section No. 626.31(B)]	Same output option
Public Input No. 964-NFPA 70-2023 [Section No. 626.31(C)]	Same output option
Public Input No. 963-NFPA 70-2023 [Section No. 626.31(B)]	
Public Input No. 964-NFPA 70-2023 [Section No. 626.31(C)]	
Public Input No. 965-NFPA 70-2023 [Section No. 626.32]	

Submitter Information Verification

Submitter Full Name: Frank Tse
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City:
State:
Zip:
Submittal Date: Wed Jun 07 09:20:17 EDT 2023
Committee: NEC-P12

Public Input No. 2770-NFPA 70-2023 [Section No. 626.30(B)]

(B) Electrified Truck Parking Space Supply Equipment.

The electrified truck parking space supply equipment, or portion thereof, providing electric power for the operation of TRUs shall be independent of the loads in ~~Part III of~~ Article 626 , Part III .

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
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Zip:
Submittal Date: Thu Aug 24 20:26:20 EDT 2023
Committee: NEC-P12

Public Input No. 963-NFPA 70-2023 [Section No. 626.31(B)]

(B) Location.

The disconnecting means shall be readily accessible, located not more than 750 mm (30 in.) from ~~the receptacle it controls~~ the outlet supplying the receptacle or cord connector , and located in the supply circuit ahead of the outlet supplying the receptacle or cord connector . Circuit breakers or switches located in power outlets complying with this section shall be permitted as the disconnecting means.

Statement of Problem and Substantiation for Public Input

This proposal adds an alternative means for supplying power to TRUs. There is no safety reason to limit the supply connection to only receptacle. Disconnect switches with integral cord and connector are readily available and can be installed to satisfy the requirements in sections 626.31(A) and 626.32.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 962-NFPA 70-2023 [Section No. 626.30]	Same output option
Public Input No. 964-NFPA 70-2023 [Section No. 626.31(C)]	Same output option
Public Input No. 962-NFPA 70-2023 [Section No. 626.30]	
Public Input No. 964-NFPA 70-2023 [Section No. 626.31(C)]	
Public Input No. 965-NFPA 70-2023 [Section No. 626.32]	

Submitter Information Verification

Submitter Full Name: Frank Tse
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Zip:
Submittal Date: Wed Jun 07 09:28:24 EDT 2023
Committee: NEC-P12

Public Input No. 964-NFPA 70-2023 [Section No. 626.31(C)]

(C) Receptacles and Cord Connectors .

All receptacles and cord connectors shall be listed and of the grounding type. Every electrified truck parking space intended to provide an electrical supply for TRUs shall be equipped with one or more of the following:

(1) A 30-ampere, 480-volt, 3-phase, 3-pole, 4-wire receptacle or cord connector

(2) A 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire receptacle or cord connector

(3) A 20-ampere, 1000-volt, 3-phase, 3-pole, 4-wire receptacle or cord connector , pin and sleeve type

(4) A 60-ampere, 250-volt, 3-phase, 3-pole, 4-wire receptacle or cord connector

(5) A 60-ampere, 480-volt, 3-phase, 3-pole, 4-wire receptacle or cord connector

Informational Note: See UL 1686-2012, *Pin and Sleeve Configurations*, Figure C2.11, for complete details of the 30-ampere pin and sleeve receptacle configuration for refrigerated containers (TRUs) and for various configurations of 60-ampere pin and sleeve receptacles.

Statement of Problem and Substantiation for Public Input

This proposal adds an additional option for supplying electricity to TRUs. There is no safety reason to limit the supply connection to only receptacle and separable power supply cable assembly combination. Disconnect switches with integral cord and connector are readily available and can be installed to satisfy the requirements in sections 626.31(A), 626.31(B), and 626.32.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 962-NFPA 70-2023 [Section No. 626.30]	Same output option
Public Input No. 963-NFPA 70-2023 [Section No. 626.31(B)]	Same output option
Public Input No. 962-NFPA 70-2023 [Section No. 626.30]	
Public Input No. 963-NFPA 70-2023 [Section No. 626.31(B)]	
Public Input No. 965-NFPA 70-2023 [Section No. 626.32]	

Submitter Information Verification

Submitter Full Name: Frank Tse
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Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 07 09:29:39 EDT 2023
Committee: NEC-P12

Public Input No. 965-NFPA 70-2023 [Section No. 626.32]

626.32 ~~Separable~~ Power Supply ~~Cable Assembly~~ Cable Assembly .

A separable power supply ~~cable assembly~~ cable assembly , consisting of a cord with an attachment plug and cord connector, shall be one of the types and ratings specified in 626.32(A), (B), and (C). Cords with adapters and pigtail ends, extension cords, and similar items shall not be used.

A permanently connected power supply cable assembly, consisting of a cord with a cord connector, shall be one of the types and ratings specified in 626.32 (A) , (B), and (D).

(A) Rating(s).

The power supply cable assembly shall be listed and rated in accordance with one of the following:

(1) A 30-ampere, 480-volt, 3-phase assembly

(2) A 60-ampere, 208-volt, 3-phase assembly

(3) A 20-ampere, 1000-volt, 3-phase assembly

(4) A 60-ampere, 480-volt, 3-phase assembly

(5) A 60-ampere, 250-volt, 3-phase assembly

(B) ~~Cord Assemblies~~ Cable Assemblies .

The cord shall be a listed type with four conductors, for 3-phase connection, one of which shall be identified in accordance with 400.23 for use as the equipment grounding conductor. Extra-hard usage cables rated not less than 90°C (194°F), 600 volts, listed for both wet locations and sunlight resistance, and having an outer jacket rated to be resistant to temperature extremes, oil, gasoline, ozone, abrasion, acids, and chemicals, shall be permitted where flexibility is necessary between the electrified truck parking space supply equipment and the inlet(s) on the TRU.

(C) Drive-away Protection

The power supply cable assembly shall be provided with an integral breakaway means that prevents physical damage or rupture, in the event of an unintended drive-away, at the attachment plug's or connector's connection to the respective receptacle or inlet.

(D) Attachment Plug(s) and Cord Connector(s).

Where a flexible cord is provided with an attachment plug and/or cord connector, they shall comply with 250.138(A). The attachment plug(s) and/or cord connector(s) shall be listed, by itself or as part of the power-supply ~~cable~~ cord assembly, for the purpose and shall be molded to or installed on the flexible cord so that it is secured tightly to the cord at the point where the cord enters the attachment plug or cord connector. If a right-angle cap is used, the configuration shall be oriented so that the grounding member is farthest from the cord. An attachment plug and/or cord connector for the connection of a truck or trailer shall be rated in accordance with one of the following:

(1) 30-ampere, 480-volt, 3-phase, 3-pole, 4-wire and intended for use with 30-ampere, 480-volt, 3-phase, 3-pole, 4-wire receptacles and inlets, respectively

(2) 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire and intended for use with 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire receptacles and inlets, respectively

(3) 20-ampere, 1000-volt, 3-phase, 3-pole, 4-wire and intended for use with 20-ampere, 1000-volt, 3-phase, 3-pole, 4-wire receptacles and inlets, respectively

(4) 60-ampere, 480-volt, 3-phase, 3-pole, 4-wire and intended for use with 60-ampere, 480-volt, 3-phase, 3-pole, 4-wire receptacles and inlets, respectively

(5) 60-ampere, 250-volt, 3-phase, 3-pole, 4-wire and intended for use with 60-ampere, 250-volt, 3-phase, 3-pole, 4-wire receptacles and inlets, respectively

Informational Note: See UL 1686-2012, *Pin and Sleeve Configurations*, Figures C2.12 and C2.11, for complete details of the 30-ampere pin and sleeve receptacle configuration for refrigerated containers (TRUs) and for various configurations of 60-ampere pin and sleeve receptacles.

Statement of Problem and Substantiation for Public Input

This proposal adds an important requirement to ensure safe break away of the power supply cord should an unintended drive away event occurs. Unintended drive away protection has been an integral part of the safety system built into fuel dispensing stations. Each fuel line is provide with a break away to safely separate the hose during an unintended drive away event. The same safeguard shall be provided for the cords supplying the TRUs, as the consequence of an unintended drive away can range from a broken connector or inlet up to damaging permanently mounted supply equipment. eTRU will increase in popularity, as it is one of the more effective means to combat climate change by removing reliance on onboard diesel power generation. We must make sure such solution does not create unintended hazards.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 962-NFPA 70-2023 [Section No. 626.30]	Same output option
Public Input No. 963-NFPA 70-2023 [Section No. 626.31(B)]	Same output option
Public Input No. 964-NFPA 70-2023 [Section No. 626.31(C)]	Same output option

Submitter Information Verification

Submitter Full Name: Frank Tse
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Zip:

Submittal Date: Wed Jun 07 11:16:20 EDT 2023
Committee: NEC-P12

Public Input No. 2805-NFPA 70-2023 [New Section after 630.1]

630.2 Listing Requirements.

All welding and cutting power equipment under the scope of this article shall be listed.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document when general listing requirements are covered within an article. The NEC Style Manual Section 2.2.1 Parallel Numbering Required, states that technical committees shall use the following section numbers for the same purposes within articles. The listing requirements are to be located in the .2 section.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2804-NFPA 70-2023 [Section No. 630.6]	Deleted and relocated to the .2 section.
Public Input No. 2804-NFPA 70-2023 [Section No. 630.6]	

Submitter Information Verification

Submitter Full Name: Dean Hunter
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Zip:
Submittal Date: Fri Aug 25 12:59:02 EDT 2023
Committee: NEC-P12

Public Input No. 628-NFPA 70-2023 [New Section after 630.1]

630.2 Reconditioned Equipment

Electric Welders shall not be reconditioned.

Statement of Problem and Substantiation for Public Input

These items are not permitted to be reconditioned per the NEMA Technical Position on Reconditioned Equipment (NEMA CS 100-2020, Appendix B.1)

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 634-NFPA 70-2023 [New Section after 692.1]	

Submitter Information Verification

Submitter Full Name: Russ Leblanc
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Zip:
Submittal Date: Sun Apr 16 09:33:55 EDT 2023
Committee: NEC-P12

Public Input No. 2804-NFPA 70-2023 [Section No. 630.6]

~~**630.6** Listing.~~

~~All welding and cutting power equipment under the scope of this article shall be listed.~~

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document when general listing requirements are covered within an article. The NEC Style Manual Section 2.2.1 Parallel Numbering Required, states that technical committees shall use the following section numbers for the same purposes within articles. The listing requirements are to be located in the .2 section.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2805-NFPA 70-2023 [New Section after 630.1]	Deleted and relocated to the .2 section.
Public Input No. 2805-NFPA 70-2023 [New Section after 630.1]	

Submitter Information Verification

Submitter Full Name: Dean Hunter
Organization: Minnesota Department of Labor
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 25 12:57:52 EDT 2023
Committee: NEC-P12

Public Input No. 2449-NFPA 70-2023 [New Section after 630.8]

630.9 Welder(s) and Other Load(s)_

Unless expressly prohibited, in which case add clarifying language, provide language as to how conductors, overcurrent protection, etc. for non-welder loads such as lighting, and non-welder receptacle outlets, other outlets, etc. which are connected to a welder feeder or branch circuit including any taps are to be calculated.

- Article 430.24 “Several Motors or a Motor(s) and Other Load(s)”, 430.53 “Several Motors or Loads on One Branch Circuit, 430.55 “Combined Overcurrent Protection” and 430.63 “Rating or Setting - Motor Load and Other Load(s) may serve as a methodology for establishing conductor sizing and overcurrent language for new code article named “Welder(s) and Other Loads(s)”.

Statement of Problem and Substantiation for Public Input

To help ensure the practical safeguarding of persons and property.

Submitter Information Verification

Submitter Full Name: Gary Hein
Organization: [Not Specified]
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 17 12:26:21 EDT 2023
Committee: NEC-P12

Public Input No. 2238-NFPA 70-2023 [Section No. 630.8]

~~**630.8** Ground-Fault Circuit-Interrupter Protection for Personnel.~~

~~All 125-volt, 15- and 20-ampere receptacles for electrical hand tools or portable lighting equipment, supplied by single-phase branch circuits rated 150 volts or less to ground, installed in work areas where welders are operated shall have ground-fault circuit-interrupter protection for personnel.~~

Statement of Problem and Substantiation for Public Input

This requirement is not within the scope of Article 630. Submitted a public input to relocate to new rule 210.8(B)(16).

Submitter Information Verification

Submitter Full Name: Mike Holt
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Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 15 12:56:20 EDT 2023
Committee: NEC-P12

Public Input No. 243-NFPA 70-2023 [Section No. 630.8]

~~**630.8** Ground-Fault Circuit-Interrupter Protection for Personnel.~~

~~All 125-volt, 15- and 20-ampere receptacles for electrical hand tools or portable lighting equipment, supplied by single-phase branch circuits rated 150 volts or less to ground, installed in work areas where welders are operated shall have ground-fault circuit-interrupter protection for personnel.~~

Statement of Problem and Substantiation for Public Input

Delete this requirement. GFCI protection of receptacles does not fall within the scope of Article 630. IF this requirement were to exist anywhere 210.8 would be the appropriate location. It does not belong here.

Submitter Information Verification

Submitter Full Name: Russ Leblanc
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Submittal Date: Sat Jan 28 14:59:52 EST 2023
Committee: NEC-P12

Public Input No. 577-NFPA 70-2023 [Section No. 630.8]

~~**630.8** Ground-Fault Circuit-Interrupter Protection for Personnel.~~

~~All 125-volt, 15- and 20-ampere receptacles for electrical hand tools or portable lighting equipment, supplied by single-phase branch circuits rated 150 volts or less to ground, installed in work areas where welders are operated shall have ground-fault circuit-interrupter protection for personnel.~~

Statement of Problem and Substantiation for Public Input

The scope of Article 630 is the welder, not everything surrounding it. This never should have been included this article.

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Submittal Date: Mon Apr 10 14:03:47 EDT 2023
Committee: NEC-P12

Public Input No. 2333-NFPA 70-2023 [Section No. 630.12(A)]

(A) For Welders.

Each welder shall have overcurrent protection rated or set at not more than 200 percent of I_{1max}. Alternatively, if the I_{1max} is not given, the overcurrent protection shall be rated or set at not more than 200 percent of the rated primary current of the welder.

An overcurrent device shall not be required for a welder that has supply conductors protected by an overcurrent device rated or set at not more than 200 percent of I_{1max} or at the rated primary current of the welder.

If the supply conductors for a welder are protected by an overcurrent device rated or set at not more than 200 percent of I_{1max} or at the rated primary current of the welder, a separate overcurrent device shall not be required.

Add language prohibiting other loads/devices from being connected to the load side of the required overcurrent protection for each welder unless the other devices/loads are suitably protected by the up to 200% allowed for welders.

Statement of Problem and Substantiation for Public Input

To help ensure the practical safeguarding of persons and property, add language prohibiting other loads/devices from being connected to the load side of the required overcurrent protection for each welder unless the other devices/loads are suitably protected by the up to 200% allowed for welders.

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Submittal Date: Wed Aug 16 12:56:58 EDT 2023
Committee: NEC-P12

Public Input No. 3044-NFPA 70-2023 [Section No. 630.15]

630.15 Grounding of Welder Secondary Circuit.

The secondary circuit conductors of an arc welder, consisting of the electrode conductor and the work conductor, shall not be considered as premises wiring for the purpose of ~~applying Article 250~~ grounding and bonding .

Informational Note: Connecting welder secondary circuits to grounded objects can create parallel paths and can cause objectionable current over equipment grounding conductors.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In this case, it is suggested we simply replace with "grounding and bonding", the subject of Article 250, to be compliant without changing the meaning of the section. The existing informational note does a good job of explaining the consequences of blindly following Article 250.

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Committee: NEC-P12

Public Input No. 2448-NFPA 70-2023 [Section No. 630.32(A)]

(A) For Welders.

Each welder shall have an overcurrent device rated or set at not more than 300 percent of the rated primary current of the welder. If the supply conductors for a welder are protected by an overcurrent device rated or set at not more than 200 percent of the rated primary current of the welder, a separate overcurrent device shall not be required.

Add language prohibiting other loads/devices from being connected to the load side of the required overcurrent protection for each welder unless the other devices/loads are suitably protected by the up to 200% or 300% allowed for welders.

Statement of Problem and Substantiation for Public Input

To help ensure the practical safeguarding of persons and property.

Submitter Information Verification

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Submittal Date: Thu Aug 17 12:21:27 EDT 2023
Committee: NEC-P12

Public Input No. 3063-NFPA 70-2023 [Section No. 640.1(A)]

(A) Covered.

This article covers equipment and wiring for audio signal generation, recording, processing, amplification, and reproduction; distribution of sound; public address; speech input systems; temporary audio system installations; and electronic organs or other electronic musical instruments. This also includes audio systems subject to Article 517, Part VI, and ~~Articles~~ ~~518~~ ~~,~~ ~~520~~ ~~,~~ ~~525~~ ~~, and~~ ~~530~~ other special occupancies .

Informational Note: Examples of permanently installed distributed audio system locations include, but are not limited to, restaurant, hotel, business office, commercial and retail sales environments, churches, and schools. Both portable and permanently installed equipment locations include, but are not limited to, residences, auditoriums, theaters, stadiums, and movie and television studios. Temporary installations include, but are not limited to, auditoriums, theaters, stadiums (which use both temporary and permanently installed systems), and outdoor events such as fairs, festivals, circuses, public events, and concerts.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing entire articles except Article 100 or where required for context. As such, it is suggested here that we change to "other special occupancies" instead of the list of articles previously included in the scope statement. The intent here is to not change the overall scope, but comply with the style manual.

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Committee: NEC-P12

Public Input No. 3079-NFPA 70-2023 [Section No. 640.3]

640.3 ~~–~~ **4** Locations and Other Articles.

Circuits and equipment shall comply with 640.3 ~~3~~ 4 (A) through (~~N~~ K), as applicable.

(A) Spread of Fire or Products of Combustion.

Section 300.21 shall apply.

(B) Ducts, Plenums, and Other Air-Handling Spaces.

Section 300.22(B) shall apply to circuits and equipment installed in ducts specifically fabricated for environmental air. Section 300.22(C) shall apply to circuits and equipment installed in other spaces used for environmental air (plenums).

Exception No. 1: Class 2 and Class 3 cables installed in accordance with 722.135(B) shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 2: Class 2 and Class 3 cables installed in accordance with 722.135(B) shall be permitted to be installed in other spaces used for environmental air (plenums).

Informational Note: See NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 4.3.11.2.6.5, which permits loudspeakers, loudspeaker assemblies, and their accessories listed in accordance with UL 2043-2013, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, to be installed in other spaces used for environmental air (ceiling cavity plenums).

(C) Communications Cables.

Types CMP, CMR, CMG, and CM communications cables shall be permitted to substitute for Class 2 and Class 3 cables in accordance with 722.135(E).

(D) Cable Trays.

Cable trays and cable tray systems shall be installed in accordance with Part II of Article 392. The installation of Class 2, Class 3, and Type PLTC cables in cable trays shall be in accordance with 722.135(B).

(E) Hazardous (Classified) Locations.

Equipment used in hazardous (classified) locations shall comply with the applicable requirements of Chapter 5.

(F) – ~~Assembly~~ Special Occupancies ~~.~~

~~Equipment~~

Audio equipment used in

~~assembly~~

special occupancies shall comply with

~~Article 518 .~~

~~**(G)** Theaters, Audience Areas of Motion Picture and Television Studios, and Similar Locations.~~

~~Equipment used in theaters, audience areas of motion picture and television studios, and similar locations shall comply with Article 520 .~~

~~**(H)** Carnivals, Circuses, Fairs, and Similar Events.~~

~~Equipment used in carnivals, circuses, fairs, and similar events shall comply with Article 525 .~~

~~**(I)** Motion Picture and Television Studios.~~

~~Equipment used in motion picture and television studios shall comply with Article 530 .~~

~~**(J)** Swimming Pools, Fountains, and Similar Locations.~~

~~Audio equipment used in or near swimming pools, fountains, and similar locations shall comply with Article 680 .~~

~~**(K)**~~

the requirements in the associated special occupancy article of Chapter 5.

(G) Combination Systems.

Where the authority having jurisdiction permits audio systems for paging or music, or both, to be combined with fire alarm systems, the wiring shall comply with Article 760.

Informational Note: See *NFPA 72*, *National Fire Alarm and Signaling Code*, and NFPA *101*, *Life Safety Code*, for installation requirements for such combination systems.

(~~L~~ H) Antennas.

Equipment used in audio systems that contain an audio or video tuner and an antenna input shall comply with ~~Article 810~~ the Chapter 8 requirements . Wiring other than antenna wiring that connects such equipment to other audio equipment shall comply with this article.

(~~M~~ I) Generators.

Generators shall be installed in accordance with 445.10 through 445.12, 445.14 through 445.16, and 445.18. Grounding of portable and vehicle-mounted generators shall be in accordance with 250.34.

(~~N~~ K) Organ Pipes.

Additions of pipe organ pipes to an electronic organ shall be in accordance with 650.4 through 650.9.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article other than Article 100 or where required for context. The current sections F through J are not modifying the requirements found in the special occupancy articles so it is suggested that we replace this language with a common statement making it clear that the equipment requirements in special occupancies is subject to the equipment requirements of the applicable special occupancy article. Alternatively, 90.3 applies so these specific items could be deleted if the panel chooses to do so. I proposed leaving them for usability and to make it clear where the equipment requirements are found. In addition, Section 2.2.1 requires the reconditioned language to be in the .3 section, so it is proposed to move this language to the .4 section to comply with the revision to the 2023 Style Manual.

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Submittal Date: Tue Aug 29 11:07:25 EDT 2023
Committee: NEC-P12

Public Input No. 575-NFPA 70-2023 [Section No. 640.3]

640.3 Locations and Other Articles.

Circuits and equipment shall comply with 640.3(A) through (N), as applicable.

(A) Spread of Fire or Products of Combustion.

Section 300.21 shall apply.

(B) Ducts, Plenums, and Other Air-Handling Spaces.

Section 300.22(B) shall apply to circuits and equipment installed in ducts specifically fabricated for environmental air. Section 300.22(C) shall apply to circuits and equipment installed in other spaces used for environmental air (plenums).

Exception No. 1: *Class 2 and Class 3 cables installed in accordance with 722.135(B) shall be permitted to be installed in ducts specifically fabricated for environmental air.*

Exception No. 2: *Class 2 and Class 3 cables installed in accordance with 722.135(B) shall be permitted to be installed in other spaces used for environmental air (plenums).*

Informational Note: See NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems* , 4.3.11.2.6.5, which permits loudspeakers, loudspeaker assemblies, and their accessories listed in accordance with UL 2043-2013, *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces* , to be installed in other spaces used for environmental air (ceiling cavity plenums).

(C) Communications Cables.

Types CMP, CMR, CMG, and CM communications cables shall be permitted to substitute for Class 2 and Class 3 cables in accordance with 722.135(E) .

(D) Cable Trays.

Cable trays and cable tray systems shall be installed in accordance with Part II of Article 392 . The installation of Class 2, Class 3, and Type PLTC cables in cable trays shall be in accordance with 722.135(B) .

(E) Hazardous (Classified) Locations.

Equipment used in hazardous (classified) locations shall comply with the applicable requirements of Chapter 5 .

(F) Assembly Occupancies.

Equipment used in assembly occupancies shall comply with Article 518 .

(G) Theaters, Audience Areas of Motion Picture and Television Studios, and Similar Locations.

Equipment used in theaters, audience areas of motion picture and television studios, and similar locations shall comply with Article 520 .

(H) Carnivals, Circuses, Fairs, and Similar Events.

Equipment used in carnivals, circuses, fairs, and similar events shall comply with Article 525 .

(I) Motion Picture and Television Studios.

Equipment used in motion picture and television studios shall comply with Article 530 .

(J) Swimming Pools, Fountains, and Similar Locations.

Audio equipment used in or near swimming pools, fountains, and similar locations shall comply with Article 680 .

~~**(K)** Combination Systems.~~

~~Where the authority having jurisdiction permits audio systems for paging or music, or both, to be combined with fire alarm systems, the wiring shall comply with Article 760 .~~

~~Informational Note: See *NFPA 72* , *National Fire Alarm and Signaling Code* , and NFPA *101* , *Life Safety Code* , for installation requirements for such combination systems.~~

~~**(L)** Antennas.~~

~~Equipment used in audio systems that contain an audio or video tuner and an antenna input shall comply with Article 810 . Wiring other than antenna wiring that connects such equipment to other audio equipment shall comply with this article.~~

~~**(M)** Generators.~~

~~Generators shall be installed in accordance with 445.10 through 445.12 , 445.14 through 445.16 , and 445.18 . Grounding of portable and vehicle-mounted generators shall be in accordance with 250.34 .~~

~~**(N)** Organ Pipes.~~

~~Additions of pipe organ pipes to an electronic organ shall be in accordance with 650.4 through 650.9 .~~

Statement of Problem and Substantiation for Public Input

This entire section is covered by 90.3 and violates 4.1.1 of the Style Manual.

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Committee: NEC-P12

Public Input No. 14-NFPA 70-2023 [Section No. 640.3(B)]

(B) Ducts, Plenums, and Other Air-Handling Spaces.

Section 300.22(B) shall apply to circuits and equipment installed in ducts specifically fabricated for environmental air. Section 300.22(C) shall apply to circuits and equipment installed in other spaces used for environmental air (plenums).

Exception No. 1: Class 2 and Class 3 cables installed in accordance with 722.135(B) shall be permitted to be installed in ducts specifically fabricated for environmental air.

Exception No. 2: Class 2 and Class 3 cables installed in accordance with 722.135(B) shall be permitted to be installed in other spaces used for environmental air (plenums).

Informational Note: See NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 4 8 .3 5 .11 5 .2. 6.5 , which permits loudspeakers, loudspeaker assemblies, and their accessories listed in accordance with UL 2043-2013 , *Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*, to be installed in other spaces used for environmental air (ceiling cavity plenums).

Statement of Problem and Substantiation for Public Input

The requirements for loudspeakers in 4.3.11.2.6.5 in NFPA 90A-2021 will be moved to 8.5.5.6 in the next (2024) edition of NFPA 90A.

The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states “Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard.”

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]	Revise NFPA 90A reference
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]	Revise NFPA 90A reference
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]	Revise NFPA 90A reference
Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]	Revise NFPA 90A reference
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]	Revise NFPA 90A reference
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)]	Revise NFPA 90A reference
Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)]	Revise NFPA 90A reference
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]	Revise NFPA 90A reference
Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]	Revise NFPA 90A reference
Public Input No. 26-NFPA 70-2023 [Section No. 800.170]	Revise NFPA 90A reference
Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]	Revise NFPA 90A reference
Public Input No. 15-NFPA 70-2023 [Section No. 110.12(C)]	
Public Input No. 17-NFPA 70-2023 [Section No. 722.24(A)]	
Public Input No. 18-NFPA 70-2023 [Section No. 722.135(B)]	
Public Input No. 19-NFPA 70-2023 [Section No. 770.24(A)]	
Public Input No. 20-NFPA 70-2023 [Section No. 770.113(B)(2)]	
Public Input No. 21-NFPA 70-2023 [Section No. 770.113(C)(2)]	

Public Input No. 22-NFPA 70-2023 [Section No. 800.24(A)]
Public Input No. 24-NFPA 70-2023 [Section No. 800.113(B)(2)]
Public Input No. 25-NFPA 70-2023 [Section No. 800.113(C)(2)]
Public Input No. 26-NFPA 70-2023 [Section No. 800.170]
Public Input No. 27-NFPA 70-2023 [Section No. 800.182(A)]

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 2771-NFPA 70-2023 [Section No. 640.3(D)]

(D) Cable Trays.

Cable trays and cable tray systems shall be installed in accordance with ~~Part II of~~ Article 392 , Part II . The installation of Class 2, Class 3, and Type PLTC cables in cable trays shall be in accordance with 722.135(B).

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 4003-NFPA 70-2023 [Section No. 640.3(E)]

(E) Hazardous (Classified) Locations.

Equipment used in hazardous (classified) locations shall comply with the applicable requirements of ~~Chapter~~ ~~5~~ I DON'T KNOW WHAT TO PUT HERE .

Statement of Problem and Substantiation for Public Input

"the appropriate requirements of Chapter 5" violates the style guide restriction of calling out whole articles. A chapter is a collection of articles, therefore it must be disallowed. I don't know the appropriate replacement text. I'm hoping the panel can reach out to the appropriate CMP (14?) and get the correct answer.

Submitter Information Verification

Submitter Full Name: Chad Jones
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Submittal Date: Wed Sep 06 13:25:57 EDT 2023
Committee: NEC-P12

Public Input No. 3064-NFPA 70-2023 [Section No. 640.3(K)]

(K) Combination Systems.

Where the authority having jurisdiction permits audio systems for paging or music, or both, to be combined with fire alarm systems, the wiring shall comply with Article 760, Parts I through IV as applicable .

Informational Note: See *NFPA 72*, *National Fire Alarm and Signaling Code*, and NFPA *101*, *Life Safety Code*, for installation requirements for such combination systems.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article, except Article 100 or where required for context. In this instance, we're asking the user to look for the wiring requirements in 760 and those are found in Parts I through IV, with Part V containing the equipment requirement. Changing as proposed to make it clear that we're asking the user to comply with Parts I through IV would be the preferred approach, I believe, in this instance.

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Submittal Date: Tue Aug 29 10:45:59 EDT 2023
Committee: NEC-P12

Public Input No. 576-NFPA 70-2023 [Section No. 640.5]

~~**640.5** Access to Electrical Equipment Behind Panels Designed to Allow Access.~~

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

Statement of Problem and Substantiation for Public Input

This is already required by 300.23. See 90.3 and 4.1.1 of the Style Manual.

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Submittal Date: Mon Apr 10 14:00:49 EDT 2023
Committee: NEC-P12

Public Input No. 3122-NFPA 70-2023 [Section No. 640.7(C)]

(C) Isolated Ground Receptacles.

Isolated grounding-type receptacles shall be permitted as described in 250.146(D), and for the implementation of other technical power systems in compliance with ~~Article~~ ~~250~~ the grounding and bonding requirements of this Code . For separately derived systems with 60 volts to ground, the branch-circuit equipment grounding conductor shall be terminated as required in 647.6(B).

Informational Note: See 406.3(E) for grounding-type receptacles and required identification.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing the entire article with the exception of Article 100 or where required for context. As such, the proposed text is intended to comply with the Style Manual requirement without altering the meaning of the current text language.

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Submittal Date: Tue Aug 29 13:07:23 EDT 2023
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Public Input No. 3123-NFPA 70-2023 [Section No. 640.9(A)(2)]

(2) Separately Derived Power Systems.

Separately derived systems shall comply with the applicable articles of this *Code*, except as modified by this article. Separately derived systems with 60 volts to ground ~~shall~~ installed in accordance with 647.3 shall be permitted for use in audio system ~~installations as specified in Article 647~~ .

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing the entire article with the exception of Article 100 or where required for context. That said, I see no specific provisions currently stated in Article 647 referencing Audio Systems so I presume the intent here is that a 60 V AC system with a Technical Equipment Ground is intended to be permitted here. 647.3 specifies the requirements in 647 which are required in order for a separately derived system to be used. This is intended to correct the current text to comply with the style manual requirements, and for correlation with the existing text, but not intended to change the requirements that exist in the published 2023 NEC(r).

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Submittal Date: Tue Aug 29 13:20:53 EDT 2023
Committee: NEC-P12

Public Input No. 2772-NFPA 70-2023 [Section No. 640.9(A)(3)]

(3) Other Wiring.

All wiring not connected to the premises wiring system or to a wiring system separately derived from the premises wiring system shall comply with ~~Part II of~~ Article 725 , Part II .

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
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Submittal Date: Thu Aug 24 20:31:09 EDT 2023
Committee: NEC-P12

Public Input No. 3124-NFPA 70-2023 [Section No. 640.9(A)(3)]

(3) Other Wiring.

All wiring not connected to the premises wiring system or to a wiring system separately derived from the premises wiring system shall comply ~~with Part II of Article 725~~ with Article 725, Part II .

Statement of Problem and Substantiation for Public Input

This revision is intended to be purely editorial and to comply with Section 4.1.4 of the NEC(r) Style Manual. In accordance with the Style Manual, Section 4.1.4, "the article number shall precede the part number."

Submitter Information Verification

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Submittal Date: Tue Aug 29 13:29:02 EDT 2023
Committee: NEC-P12

Public Input No. 953-NFPA 70-2023 [Section No. 640.9(A)(3)]

(3) Other Wiring.

All wiring not connected to the premises wiring system or to a wiring system separately derived from the premises wiring system shall comply with ~~Part II of~~ Article 725 , Part II .

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
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Submittal Date: Mon Jun 05 10:56:58 EDT 2023
Committee: NEC-P12

Public Input No. 3126-NFPA 70-2023 [Section No. 640.9(B)]

(B) Auxiliary Power Supply Wiring.

Equipment that has a separate input for an auxiliary power supply shall be wired in compliance with Article ~~725 . Battery installation~~ 724.3 . If applicable, battery installation greater than 1kWh shall be installed in accordance with ~~Article~~ 480 .3 through 480.13. This section shall not apply to the use of uninterruptible power supply (UPS) equipment, or other sources of supply, that are intended to act as a direct replacement for the primary circuit power source and are connected to the primary circuit input.

Informational Note: See *NFPA 72*-2019, *National Fire Alarm and Signaling Code*, where equipment is used for a fire alarm system.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing the entire article with the exception of Article 100 or where required for context. In this section, though, I believe there are correlation problems with the existing text as the Class 1 circuit requirements were moved to Article 724 in the 2023 revision and the scope of Article 480 was clarified to only apply to systems in excess of 1kWh. It is not clear that this would automatically apply, now, to a battery system provided for the auxiliary power supply for audio systems. A proposed revision is shown, though the panel should confirm the intent of this section vs. the current published text in the 2023 NEC(r) to confirm that this isn't a misinterpretation of the intended requirement.

Submitter Information Verification

Submitter Full Name: Richard Holub
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Zip:
Submittal Date: Tue Aug 29 13:41:04 EDT 2023
Committee: NEC-P12

Public Input No. 3187-NFPA 70-2023 [Section No. 640.9(C)]

(C) Output Wiring and Listing of Amplifiers.

Amplifiers with output circuits carrying audio program signals shall be permitted to employ Class 1, Class 2, or Class 3 wiring where the amplifier is listed and marked for use with the specific class of wiring method. Such listing shall ensure the energy output is equivalent to the shock and fire risk of the same class as stated in ~~Articles 724 and 725~~ applicable article . Overcurrent protection shall be provided and shall be permitted to be inherent in the amplifier.

Audio amplifier output circuits wired using Class 1 wiring methods shall be considered equivalent to Class 1 circuits and shall be installed in accordance with 724.46, where applicable.

Audio amplifier output circuits wired using Class 2 or Class 3 wiring methods shall be considered equivalent to Class 2 or Class 3 circuits, respectively. They shall use conductors insulated at not less than the requirements of 722.179 and shall be installed in accordance with 722.135 and 725.136 through 725.144.

Informational Note No. 1: See UL 1711-2016, *Amplifiers for Fire Protective Signaling Systems*, which contains requirements for the listing of amplifiers used for fire alarm systems in compliance with *NFPA 72*-2019, *National Fire Alarm and Signaling Code*.

Informational Note No. 2: See UL 813-1996, *Commercial Audio Equipment*; UL 1419-2016, *Professional Video and Audio Equipment*; ANSI/UL 1492-1996, *Audio-Video Products and Accessories*; UL 6500-1999, *Audio/Video and Musical Instrument Apparatus for Household, Commercial, and Similar Use*; and UL 62368-1-2014, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*, for examples of requirements for listing amplifiers used in residential, commercial, and professional use.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. As such, it is proposed to change the language here to point instead to "the applicable article" to comply with the Style Manual. Further text in the section clearly identifies specific clauses applicable to either Class 1 or Class 2/Class 3 wiring, so it is simple to identify the specific article intended if an individual isn't familiar with the Code layout, and there is a table of contents and an index as well to assist.

Submitter Information Verification

Submitter Full Name: Richard Holub
Organization: The DuPont Company, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 30 09:55:04 EDT 2023
Committee: NEC-P12

Public Input No. 3189-NFPA 70-2023 [Section No. 640.21(B)]

(B) Between Loudspeakers and Amplifiers or Between Loudspeakers.

Cables used to connect loudspeakers to each other or to an amplifier shall comply with Article 722. 135 and 722.179, as applicable . Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In this case, it is recommended to point the user specifically to 722.135 which requires the cables to be listed and 722.179 which gives more specific listing requirements depending on the application.

Submitter Information Verification

Submitter Full Name: Richard Holub
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Submittal Date: Wed Aug 30 10:04:58 EDT 2023
Committee: NEC-P12

Public Input No. 3192-NFPA 70-2023 [Section No. 640.21(C)]

(C) Between Equipment.

Cables used for the distribution of audio signals between equipment shall comply with Article 722. 135 and 722.179, as applicable . Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted. Other cable types and assemblies specified by the equipment manufacturer as acceptable for the use shall be permitted in accordance with 110.3(B).

Informational Note: See 770.3 for the classification of composite optical fiber cables.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In this case, it is recommended to point the user specifically to 722.135 which requires the cables to be listed and 722.179 which gives more specific listing requirements depending on the application.

Submitter Information Verification

Submitter Full Name: Richard Holub
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Street Address:
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Submittal Date: Wed Aug 30 10:17:09 EDT 2023
Committee: NEC-P12

Public Input No. 2773-NFPA 70-2023 [Section No. 640.42]

640.42 Use of Flexible Cords and Cables.

(A) Between Equipment and Branch-Circuit Power.

Power supply cords for audio equipment shall be listed and shall be permitted to be used where the interchange, maintenance, or repair of such equipment is facilitated through the use of a power-supply cord.

(B) Between Loudspeakers and Amplifiers, or Between Loudspeakers.

Installation of flexible cords and cables used to connect loudspeakers to each other or to an amplifier shall comply with ~~Part I of~~ Article 400 , Part I and Article 725, Parts I, II, and III ~~of Article 725~~ , respectively. Cords and cables listed for portable use, either hard or extra-hard usage as defined by Article 400, Part I, and II , shall also be permitted. Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted.

(C) Between Equipment and/or Between Equipment Racks.

Installation of flexible cords and cables used for the distribution of audio signals between equipment shall comply with Article 400, Parts I and ~~II of Article 400 and~~ II and Article 725, Parts I, II, and III ~~of Article 725~~ , respectively. Cords and cables listed for portable use, either hard or extra-hard service as defined by Article 400, shall also be permitted. Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted.

(D) Between Equipment, Equipment Racks, and Power Supplies Other Than Branch-Circuit Power.

Wiring between the following power supplies, other than branch-circuit power supplies, shall be installed, connected, or wired in accordance with this *Code* for the voltage and power required:

(1) Storage batteries

(2) Transformers

(3) Transformer rectifiers

(4) Other ac or dc power supplies

(E) Between Equipment Racks and Branch-Circuit Power.

The supply to a portable equipment rack shall be by means of listed extra-hard usage cords or cables, as defined in Table 400.4. For outdoor portable or temporary use, the cords or cables shall be further listed as being suitable for wet locations and sunlight resistant. Sections 520.5, 520.10, and 525.3 shall apply as appropriate when the following conditions exist:

(1) Where equipment racks include audio and lighting and/or power equipment

(2) When using or constructing cable extensions, adapters, and breakout assemblies

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article

number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 24 20:32:12 EDT 2023
Committee: NEC-P12

Public Input No. 3193-NFPA 70-2023 [Section No. 640.42(B)]

(B) Between Loudspeakers and Amplifiers, or Between Loudspeakers.

Installation of flexible cords and cables used to connect loudspeakers to each other or to an amplifier shall comply ~~with Part I of Article~~ 400 ~~and Parts I, II, and III of Article~~ 725 ~~,~~ ~~respectively~~ with Article 400, Part I, Article 725 , Parts I and II respectively . Cords and cables listed for portable use, either hard or extra-hard usage as defined ~~by Article~~ 400 in Table 4 00.4 , shall also be permitted. Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or where required for context. In addition, we're required to list the article first, and then the applicable part. I've also proposed removing the Part III of Article 725 as that is an equipment listing requirement and not applicable to cords or cables. Including all the parts of Article 725 is essentially referencing an entire article in violation of Section 4.1.4. The proposed public input should satisfy the style manual requirement and is not intended to change the requirements currently specified, but rather be editorial in nature. Finally, the pointer to Article 400 for hard or extra-hard usage was revised to Table 400.4 since that's the specific table with this information included.

Submitter Information Verification

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Submittal Date: Wed Aug 30 10:19:42 EDT 2023
Committee: NEC-P12

Public Input No. 954-NFPA 70-2023 [Section No. 640.42(B)]

(B) Between Loudspeakers and Amplifiers, or Between Loudspeakers.

Installation of flexible cords and cables used to connect loudspeakers to each other or to an amplifier shall comply with ~~Part I of~~ Article 400 , Part I, and Article 725, Parts I, II, and III ~~of Article 725~~ , respectively. Cords and cables listed for portable use, either hard or extra-hard usage ~~as defined by Article 400~~ , shall also be permitted. Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The reference to a definition in Article 400 was deleted because all definitions are in Article 100.

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
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Affiliation: Plastics Industry Association (PLASTICS)
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 05 11:00:34 EDT 2023
Committee: NEC-P12

Public Input No. 3194-NFPA 70-2023 [Section No. 640.42(C)]

(C) Between Equipment and/or Between Equipment Racks.

Installation of flexible cords and cables used for the distribution of audio signals between equipment shall comply with Article 400, Parts I and II ~~of Article 400 and~~ or Article 725, Parts I, II, and III ~~of Article 725 , respectively~~ respectively . Cords and cables listed for portable use, either hard or extra-hard service as defined by ~~Article~~ Table 400.4 , shall also be permitted. Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article except Article 100 or where required for context. In addition, we're required to list the article first, and then the applicable part. I've also proposed removing the Part III of Article 725 as that is an equipment listing requirement and not applicable to cords or cables. Including all the parts of Article 725 is essentially referencing an entire article in violation of Section 4.1.4. The proposed public input should satisfy the style manual requirement and is not intended to change the requirements currently specified, but rather be editorial in nature. Finally, the pointer to Article 400 for hard or extra-hard usage was revised to Table 400.4 since that's the specific table with this information included.

Submitter Information Verification

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Submittal Date: Wed Aug 30 10:28:10 EDT 2023
Committee: NEC-P12

Public Input No. 2774-NFPA 70-2023 [Section No. 645.3]

645.3 Other Articles.

Circuits and equipment shall comply with 645.3(A) through (I), as applicable.

(A) Spread of Fire or Products of Combustion.

Sections 300.21, 770.26, and 800.26 shall apply to penetrations of the fire-resistant room boundary.

(B) Wiring and Cabling in Other Spaces Used for Environmental Air (Plenums).

The following sections and tables shall apply to wiring and cabling in other spaces used for environmental air (plenums) above an information technology equipment room:

(1) Wiring methods: 300.22(C)(1)

(2) Class 2, Class 3, and PLTC cables: 722.135(B)

(3) Fire alarm systems: 760.53(B)(2) and Table 760.154

(4) Optical fiber cables: 770.113(C) and Table 770.154(a)

(5) Communications circuits: 800.133(C) and Table 800.154(a)

(6) CATV and radio distribution systems: 800.113(C) and Table 800.154(a)

(C) Bonding and Grounding.

The non-current-carrying conductive members of optical fiber cables in an information technology equipment room shall be bonded and grounded in accordance with 770.114.

(D) Electrical Classification of Data Circuits.

Section 725.60(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits.

(E) Fire Alarm Cables and Equipment.

Article 760, Parts I, II, and ~~III of Article 760 shall~~ III shall apply to fire alarm systems cables and equipment installed in an information technology equipment room. Only fire alarm cables listed in accordance with ~~Part IV of~~ Article 760 ~~and~~ , Part IV and listed fire alarm equipment shall be permitted to be installed in an information technology equipment room.

(F) Cable Routing Assemblies, Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110, 800.113, and 800.154 shall apply to cable routing assemblies and communications raceways. Article 800 and 805, Parts I, II, III, IV, and ~~V of Articles 800 and 805 shall~~ V shall apply to communications wires, cables, and equipment installed in an information technology equipment room. Only communications wires and cables listed in accordance with 800.179, cable routing assemblies, and communications raceways listed in accordance with 800.182, and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an information technology equipment room. Article 645 shall apply to the powering of communications equipment in an information technology equipment room.

Informational Note: See Article 100, Definitions, for a definition of *communications equipment*.

(G) Community Antenna Television and Radio Distribution Systems Cables and Equipment.

Article 800 and 820, Parts I, II, III, IV, and ~~V of Articles 800 and 820 shall~~ V shall apply to community antenna television and radio distribution systems cables and equipment installed in an information technology equipment room. Only community antenna television and radio distribution cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an information technology equipment room. Article 645 shall apply to the powering of community antenna television and radio distribution systems equipment installed in an information technology equipment room.

(H) Optical Fiber Cables.

Only optical fiber cables listed in accordance with 770.179 shall be permitted to be installed in an information technology equipment room.

(I) Cables Not in Information Technology Equipment Room.

Cables extending beyond the information technology equipment room shall be subject to the applicable requirements of this *Code*.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

(F) needs to identify which part of Articles 800 and 805 apply.
(G) needs to identify which part of Articles 800 and 820 apply.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
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City:
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Submittal Date: Thu Aug 24 20:35:23 EDT 2023
Committee: NEC-P12

Public Input No. 574-NFPA 70-2023 [Section No. 645.3]

645.3 Other Articles.

Circuits and equipment shall comply with 645.3(A) through (I), as applicable.

(A) Spread of Fire or Products of Combustion.

Sections 300.21 , 770.26 , and 800.26 shall apply to penetrations of the fire-resistant room boundary.

(B) Wiring and Cabling in Other Spaces Used for Environmental Air (Plenums).

The following sections and tables shall apply to wiring and cabling in other spaces used for environmental air (plenums) above an information technology equipment room:

(1) Wiring methods: 300.22(C)(1)

(2) Class 2, Class 3, and PLTC cables: 722.135(B)

(3) Fire alarm systems: 760.53(B)(2) and Table 760.154

(4) Optical fiber cables: 770.113(C) and Table 770.154(a)

(5) Communications circuits: 800.133(C) and Table 800.154(a)

(6) CATV and radio distribution systems: 800.113 (C) and Table 800.154(a)

(C) Bonding and Grounding.

The non-current-carrying conductive members of optical fiber cables in an information technology equipment room shall be bonded and grounded in accordance with 770.114 .

(D) Electrical Classification of Data Circuits.

Section 725.60(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits.

(E) Fire Alarm Cables and Equipment.

Parts I, II, and III of Article 760 shall apply to fire alarm systems cables and equipment installed in an information technology equipment room. Only fire alarm cables listed in accordance with Part IV of Article 760 and listed fire alarm equipment shall be permitted to be installed in an information technology equipment room.

(F) Cable Routing Assemblies, Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110 , 800.113 , and 800.154 shall apply to cable routing assemblies and communications raceways. Parts I, II, III, IV, and V of Articles 800 and 805 shall apply to communications wires, cables, and equipment installed in an information technology equipment room. Only communications wires and cables listed in accordance with 800.179 , cable routing assemblies, and communications raceways listed in accordance with 800.182 , and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an information technology equipment room. Article 645 shall apply to the powering of communications equipment in an information technology equipment room.

Informational Note: See Article 100 , Definitions, for a definition of *communications equipment* .

~~**(G)** Community Antenna Television and Radio Distribution Systems Cables and Equipment.~~

~~Parts I, II, III, IV, and V of Articles 800 and 820 shall apply to community antenna television and radio distribution systems cables and equipment installed in an information technology equipment room. Only community antenna television and radio distribution cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an information technology equipment room. Article 645 shall apply to the powering of community antenna television and radio distribution systems equipment installed in an information technology equipment room.~~

~~**(H)** Optical Fiber Cables.~~

~~Only optical fiber cables listed in accordance with 770.179 shall be permitted to be installed in an information technology equipment room.~~

~~**(I)** Cables Not in Information Technology Equipment Room.~~

~~Cables extending beyond the information technology equipment room shall be subject to the applicable requirements of this *Code* .~~

Statement of Problem and Substantiation for Public Input

This entire section is already addressed via 90.3 and therefore violates 4.1.1 of the Style Manual.

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Self-employed
Street Address:
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State:
Zip:
Submittal Date: Mon Apr 10 13:57:22 EDT 2023
Committee: NEC-P12

Public Input No. 3914-NFPA 70-2023 [Section No. 645.3(B)]

(B) Wiring and Cabling in Other Spaces Used for Environmental Air (Plenums).

The following sections and tables shall apply to wiring and cabling in other spaces used for environmental air (plenums) above an information technology equipment room:

(1) Wiring methods: 300.22(C)(1)

(2) Class 2, Class 3, ~~and~~ Class 4, and PLTC cables: 722.135(B)

(3) Fire alarm systems: 760.53(B)(2) and Table 760.154

(4) Optical fiber cables: 770.113(C) and Table 770.154(a)

(5) Communications circuits: 800.133(C) and Table 800.154(a)

(6) CATV and radio distribution systems: 800.113(C) and Table 800.154(a)

Statement of Problem and Substantiation for Public Input

Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.
Article 722 covers Class 2, Class 3, Class 4, and PLTC cables and treats them all the same. Therefore, Class 4 should be added to this list.

Submitter Information Verification

Submitter Full Name: Chad Jones
Organization: Cisco Systems
Street Address:
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Submittal Date: Wed Sep 06 10:22:31 EDT 2023
Committee: NEC-P12

Public Input No. 931-NFPA 70-2023 [Section No. 645.3(E)]

(E) Fire Alarm Cables and Equipment.

Article 760, Parts I, II, and III ~~of Article 760 - 7~~ 60 shall apply to fire alarm systems cables and equipment installed in an information technology equipment room. Only fire alarm cables listed in accordance with ~~Part IV of~~ Article 760 , Part IV and listed fire alarm equipment shall be permitted to be installed in an information technology equipment room.

Statement of Problem and Substantiation for Public Input

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, “The article number shall precede the part number.”

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
Organization: CableSafe, Inc./OFS
Affiliation: Plastics Industry Association (PLASTICS)
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 05 06:49:48 EDT 2023
Committee: NEC-P12

Public Input No. 3199-NFPA 70-2023 [Section No. 645.3(F)]

(F) Cable Routing Assemblies, Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110, 800.113, and 800.154 shall apply to cable routing assemblies and communications raceways. Parts I, II, III, IV, and V of Articles 800 and 805 shall apply to communications wires, cables, and equipment installed in an information technology equipment room. Only communications wires and cables listed in accordance with 800.179, cable routing assemblies, and communications raceways listed in accordance with 800.182, and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an information technology equipment room. ~~Article 645 shall~~ This article shall apply to the powering of communications equipment in an information technology equipment room.

Informational Note: See Article 100, Definitions, for a definition of *communications equipment*.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In this case, the simple proposal to change "Article 645" to "this article" satisfies the Style Manual requirement. A more complicated fix is how to address the referencing of Parts I through V of 800 and 805 - that's essentially referencing the entire article but it's not simple to correct. Section 90.3 of the style manual establishes that Chapter 8 requirements stand alone, so they wouldn't necessarily be applied to an Article 645 installation unless so referenced. While it would be nice to correct this as well, I'm recommending we leave it as is "for context" and just address the Article 645 change as proposed.

Submitter Information Verification

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Submittal Date: Wed Aug 30 10:38:24 EDT 2023
Committee: NEC-P12

Public Input No. 932-NFPA 70-2023 [Section No. 645.3(F)]

(F) Cable Routing Assemblies, Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110, 800.113, and 800.154 shall apply to cable routing assemblies and communications raceways. Article 800, Parts I, II, III , and IV, and ~~V of Articles~~ ~~800~~ ~~and~~ ~~805~~ Article 805 , Parts I, II, III and IV, shall apply to communications wires, cables, and equipment installed in an information technology equipment room. Only communications wires and cables listed in accordance with 800.179, cable routing assemblies, and communications raceways listed in accordance with 800.182, and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an information technology equipment room. Article 645 shall apply to the powering of communications equipment in an information technology equipment room.

Informational Note: See Article 100, Definitions, for a definition of *communications equipment*.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
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Affiliation: Plastics Industry Association (PLASTICS)
Street Address:
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State:
Zip:
Submittal Date: Mon Jun 05 06:57:16 EDT 2023
Committee: NEC-P12

Public Input No. 3208-NFPA 70-2023 [Section No. 645.3(G)]

(G) Community Antenna Television and Radio Distribution Systems Cables and Equipment.

Parts I, II, III, IV, and V of Articles 800 and 820 shall apply to community antenna television and radio distribution systems cables and equipment installed in an information technology equipment room. Only community antenna television and radio distribution cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an information technology equipment room. ~~Article~~ 645 ~~shall~~ This article shall apply to the powering of community antenna television and radio distribution systems equipment installed in an information technology equipment room.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In this case, the simple proposal to change "Article 645" to "this article" satisfies the Style Manual requirement. A more complicated fix is how to address the referencing of Parts I through V of 800 and 820 - that's essentially referencing the entire article but it's not simple to correct. Section 90.3 of the style manual establishes that Chapter 8 requirements stand alone, so they wouldn't necessarily be applied to an Article 645 installation unless so referenced. While it would be nice to correct this as well, I'm recommending we leave it as is "for context" and just address the Article 645 change as proposed.

Submitter Information Verification

Submitter Full Name: Richard Holub
Organization: The DuPont Company, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 30 11:23:48 EDT 2023
Committee: NEC-P12

Public Input No. 933-NFPA 70-2023 [Section No. 645.3(G)]

(G) Community Antenna Television and Radio Distribution Systems Cables and Equipment.

Article 800, Parts I, II, III ~~,~~ and IV, and ~~V of Articles 800 and 820~~ Article 820 , Parts I and V, shall apply to community antenna television and radio distribution systems coaxial cables and equipment installed in an information technology equipment room. Only community antenna television and radio distribution coaxial cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an information technology equipment room. Article 645 shall apply to the powering of community antenna television and radio distribution systems equipment installed in an information technology equipment room.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

All CATV cables are coaxial cables, so "coaxial" was added for clarity.

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
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Zip:
Submittal Date: Mon Jun 05 07:07:29 EDT 2023
Committee: NEC-P12

Public Input No. 2485-NFPA 70-2023 [Section No. 645.4]

645.4 Special Requirements for Information Technology Equipment Room.

The alternative wiring methods to Chapter 3 and Parts I and II of Article 725 for signaling wiring and Parts I and V of Article 770 for optical fiber cabling shall be permitted where all of the following conditions are met:

(1) Disconnecting means complying with 645.10 are provided.

(2) A heating/ventilating/air-conditioning (HVAC) system is provided in one of the methods identified in the following:

(3) A separate HVAC system that is dedicated for information technology equipment use and is separated from other areas of occupancy

(4) An HVAC system that serves other occupancies and meets all of the following:

(5) Also serves the information technology equipment room

(6) Provides fire/smoke dampers at the point of penetration of the room boundary

(7) Activates the damper operation upon initiation by smoke detector alarms, by operation of the disconnecting means required by 645.10 , or by both

Informational Note No. 1: See NFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*, Chapter 11, Section 11.1, 11.1.1, 11.1.2, and 11.1.3, for further information.

(8) All information technology and communications equipment installed in the room is listed. All test and measurement equipment installed in the room and required for the operation or monitoring of the information technology equipment is listed.

(9) The room is occupied by, and accessible to, only those personnel needed for the maintenance and functional operation of the installed information technology equipment.

(10) The room is separated from other occupancies by fire-resistant-rated walls, floors, and ceilings with protected openings.

Informational Note No. 2: SeeNFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*, Chapter 6, for further information on room construction requirements.

(11) Only electrical equipment and wiring associated with the operation of the information technology room is installed in the room.

Informational Note No. 3: HVAC systems, communications systems, and monitoring systems such as telephone, fire alarm systems, security systems, water detection systems, and other related protective equipment are examples of equipment associated with the operation of the information technology room.

Statement of Problem and Substantiation for Public Input

As quantum computers become commercialized, it is expected that test and measurement equipment will be deployed in the information technology room. For a superconducting quantum computer to function properly, certain equipment that is typically listed under the test and measurement equipment standard is required.

Clarifying that listed test and measurement equipment (e.g., per UL 61010-1) are allowed in information technology rooms will ensure that information technology rooms and the alternative wiring methods can be used as commercially available quantum computers are installed.

Submitter Information Verification

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Submittal Date: Fri Aug 18 12:12:00 EDT 2023
Committee: NEC-P12

Public Input No. 2775-NFPA 70-2023 [Section No. 645.4]

645.4 Special Requirements for Information Technology Equipment Room.

The alternative wiring methods to Chapter 3 and Article 725, Parts I and ~~II of Article 725 for~~ II for signaling wiring and Article 770, Parts I and ~~V of Article 770 for~~ V for optical fiber cabling shall be permitted where all of the following conditions are met:

(1) Disconnecting means complying with 645.10 are provided.

(2) A heating/ventilating/air-conditioning (HVAC) system is provided in one of the methods identified in the following:

(3) A separate HVAC system that is dedicated for information technology equipment use and is separated from other areas of occupancy

(4) An HVAC system that serves other occupancies and meets all of the following:

(5) Also serves the information technology equipment room

(6) Provides fire/smoke dampers at the point of penetration of the room boundary

(7) Activates the damper operation upon initiation by smoke detector alarms, by operation of the disconnecting means required by 645.10 , or by both

Informational Note No. 1: See NFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*, Chapter 11, Section 11.1, 11.1.1, 11.1.2, and 11.1.3, for further information.

(8) All information technology and communications equipment installed in the room is listed.

(9) The room is occupied by, and accessible to, only those personnel needed for the maintenance and functional operation of the installed information technology equipment.

(10) The room is separated from other occupancies by fire-resistant-rated walls, floors, and ceilings with protected openings.

Informational Note No. 2: SeeNFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*, Chapter 6, for further information on room construction requirements.

(11) Only electrical equipment and wiring associated with the operation of the information technology room is installed in the room.

Informational Note No. 3: HVAC systems, communications systems, and monitoring systems such as telephone, fire alarm systems, security systems, water detection systems, and other related protective equipment are examples of equipment associated with the operation of the information technology room.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee: NEC-P12

Public Input No. 672-NFPA 70-2023 [Section No. 645.4]

645.4 Special Requirements for Information Technology Equipment Room.

All requirements of this article shall be considered optional, other than as follows. The alternative wiring methods to Chapter 3 and Parts I and II of Article 725 for signaling wiring and Parts I and V of Article 770 for optical fiber cabling shall be permitted where all of the following conditions are met:

(1) Disconnecting means complying with 645.10 are provided.

(2) A heating/ventilating/air-conditioning (HVAC) system is provided in one of the methods identified in the following:

(3) A separate HVAC system that is dedicated for information technology equipment use and is separated from other areas of occupancy

(4) An HVAC system that serves other occupancies and meets all of the following:

(5) Also serves the information technology equipment room

(6) Provides fire/smoke dampers at the point of penetration of the room boundary

(7) Activates the damper operation upon initiation by smoke detector alarms, by operation of the disconnecting means required by 645.10 , or by both

Informational Note No. 1: See NFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*, Chapter 11, Section 11.1, 11.1.1, 11.1.2, and 11.1.3, for further information.

(8) All information technology and communications equipment installed in the room is listed.

(9) The room is occupied by, and accessible to, only those personnel needed for the maintenance and functional operation of the installed information technology equipment.

(10) The room is separated from other occupancies by fire-resistant-rated walls, floors, and ceilings with protected openings.

Informational Note No. 2: SeeNFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*, Chapter 6, for further information on room construction requirements.

(11) Only electrical equipment and wiring associated with the operation of the information technology room is installed in the room.

Informational Note No. 3: HVAC systems, communications systems, and monitoring systems such as telephone, fire alarm systems, security systems, water detection systems, and other related protective equipment are examples of equipment associated with the operation of the information technology room.

Statement of Problem and Substantiation for Public Input

Complying with this article was once entirely optional. That was the correct approach, because if you are not taking advantage of the permissions of 645.5 there is no reason to have to comply with the rest of the article. As written, EVERY room that has IT equipment MUST have the disconnect required by 645.10, for example. I would like to see a single example of the disconnecting means required by 645.10 in the home of any of the Code-making panel members.

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Public Input No. 934-NFPA 70-2023 [Section No. 645.4]

645.4 Special Requirements for Information Technology Equipment Room.

The alternative wiring methods to Chapter 3 and Article 722, Parts I, and ~~II of~~ Article 725 , Parts I and II 725 for signaling wiring, and Article 770, Parts I and V ~~of Article~~ 770 for optical fiber cabling shall be permitted where all of the following conditions are met:

(1) Disconnecting means complying with 645.10 are provided.

(2) A heating/ventilating/air-conditioning (HVAC) system is provided in one of the methods identified in the following:

(3) A separate HVAC system that is dedicated for information technology equipment use and is separated from other areas of occupancy

(4) An HVAC system that serves other occupancies and meets all of the following:

(5) Also serves the information technology equipment room

(6) Provides fire/smoke dampers at the point of penetration of the room boundary

(7) Activates the damper operation upon initiation by smoke detector alarms, by operation of the disconnecting means required by 645.10 , or by both

Informational Note No. 1: See NFPA 75-~~2020~~ , *Standard for the Fire Protection of Information Technology Equipment*, Chapter 11, Section 11.1, 11.1.1, 11.1.2, and 11.1.3, for further information.

(8) All information technology and communications equipment installed in the room is listed.

(9) The room is occupied by, and accessible to, only those personnel needed for the maintenance and functional operation of the installed information technology equipment.

(10) The room is separated from other occupancies by fire-resistant-rated walls, floors, and ceilings with protected openings.

Informational Note No. 2: ~~See~~NFPA 75-~~2020~~ See NFPA 75 , *Standard for the Fire Protection of Information Technology Equipment*, Chapter 6, for further information on room construction requirements.

(11) Only electrical equipment and wiring associated with the operation of the information technology room is installed in the room.

Informational Note No. 3: HVAC systems, communications systems, and monitoring systems such as telephone, fire alarm systems, security systems, water detection systems, and other related protective equipment are examples of equipment associated with the operation of the information technology room.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The references dealing with Class 2 and Class 3 cables were expanded to include new Article 722.

The edition date for NFPA 75 has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states “Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard.”

The underlining in 645.4(2) was done by TerraView. It should be ignored.

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Public Input No. 3128-NFPA 70-2023 [New Section after 645.5]

645.5(I) 416Y/240 Volt Supply Circuits.

A 416Y/240 three-phase system shall be permitted to use the following color codes beginning at the source of a 416Y/240 volt supply;

A blue conductor as a grounded conductor and a gray as a ungrounded conductor where the equipment grounding conductor is green with one or more yellow stripes and the ungrounded phase conductors are either brown for line 1, black for line 2, and gray for line 3 or brown for all ungrounded conductors. Where brown is used for all phase conductors the conductors shall also be identified by phase or line at all termination, connection and splice points by separate marking tape, tagging or other approved means.

Statement of Problem and Substantiation for Public Input

Much equipment and cables for data centers use the the IEC Standard 60445 "Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductor terminations and conductors", this color code has been standardized world wide especially in data centers where we now see 416Y/230 Volt services and feeders.
Allowing data centers to use this standard color code for 416Y/230 Volt service, feeder and branch circuits will assist with avoiding ambiguity and confusion with 480Y/277 or 208Y/120 volt systems and ensure safe operation.

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Public Input No. 3168-NFPA 70-2023 [Section No. 645.5(A)]

(A) Branch-Circuit ~~Conductors~~ Sizing .

(1) Conductor Sizing. The branch-circuit conductors supplying one or more units of information technology equipment shall have an ampacity not less than 125 percent of the total connected load.

(2) Overcurrent Protection Sizing.The branch-circuit overcurrent protective device for one or more units of information technology equipment shall have an ampere rating not less than 125 percent of the total connected load.

Statement of Problem and Substantiation for Public Input

Added text to clarify that if the branch circuit conductors are sized at 125% then the overcurrent protective device will also be sized at 125%. This added text will add clarity to Code users. Adding new second level subdivision (1) and (2) to split the requirements for clarity and in accordance with the NEC style manual.

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Public Input No. 3131-NFPA 70-2023 [Section No. 645.5(B)]

(B) Power-Supply Cords.

Information technology equipment shall be permitted to be connected to branch circuits by power-supply cords that comply with the following:

(1) Power-supply cords shall not exceed 4.5 m (15 ft).

(2) Power-supply cords shall be listed and a type permitted for use on listed information technology equipment or shall be constructed of listed flexible cord and listed attachment plugs and cord connectors of a type permitted for information technology equipment.

(3) Plugs and receptacles used to connect the power-supply cords shall be listed and identified for the system voltage and current applied.

Informational Note No. 1: See UL 60950-1, *Safety of Information Technology Equipment — Safety — Part 1: General Requirements*; or UL 62368-1, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*, for one method of determining if cords are of a permitted type.

Informational Note No. 2: See ANSI/NEMA WD-6, *Wiring Devices — Dimensional Specifications*, which identifies plug and receptacle configurations L25-30P and L25-30R for 240 Vac and L26-30P and L26-30R for 416Y/ 240 ~~/415 Vac~~ Vac .

Statement of Problem and Substantiation for Public Input

The code should use consistency when referring to a 416Y/240 volt system.
There seems to be some manufacturers calling this a 415Y/240 system, that would be like some people calling 208 '207 volt'
207 / sqrt(3) = 119.51 round up to 120V
208 / sqrt(3) = 120.09 round down to 120V
same with 415 and 416 volt.
This also correlates with other proposals to add 416Y240 as a standard voltage in other parts of the code.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2916-NFPA 70-2023 [Section No. 220.5(A)]	416Y/240 as standard voltage

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Public Input No. 3169-NFPA 70-2023 [Section No. 645.5(E)(1)]

(1) Installation Requirements for Branch-Circuit Supply Conductors Under a Raised Floor.

(a) The supply conductors shall be installed in accordance with 300.11 .

~~In addition to the wiring methods of~~

(b) If supply conductors are installed in plenum spaces, they shall comply with 300.22(C)

~~, the~~

.

(c) The following wiring methods shall also be permitted:

(1) Rigid metal conduit

(2) Rigid nonmetallic conduit

(3) Intermediate metal conduit

(4) Electrical metallic tubing

(5) Electrical nonmetallic tubing

(6) Metal wireway

(7) Nonmetallic wireway

(8) Surface metal raceway with metal cover

(9) Surface nonmetallic raceway

(10) Flexible metal conduit

(11) Liquidtight flexible metal conduit

(12) Liquidtight flexible nonmetallic conduit

(13) Type MI cable

(14) Type MC cable

(15) Type AC cable

(16) Associated metallic and nonmetallic boxes or enclosures

(17) Type TC power and control tray cable

Statement of Problem and Substantiation for Public Input

Adding new third level subdivision 645.5(E)(1)(c) and relocating 645.5(E)(1)(b) to split up these requirements. If the area under the raised floor is used as a plenum than it must comply with 300.22(C) and if its not a plenum then you can use the wiring method in list items (1) through (17). These revisions will improve usability and add clarity for Code users.

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Committee:	NEC-P12

Public Input No. 3917-NFPA 70-2023 [Section No. 645.5(E)(2)]

(2) Installation Requirements for Power-Supply Cords, Data Cables, Interconnecting Cables, and Grounding Conductors Under a Raised Floor.

The following cords, cables, and conductors shall be permitted to be installed under a raised floor:

(1) Power-supply cords of listed information technology equipment in accordance with 645.5(B).

(2) Interconnecting cables enclosed in a raceway.

(3) Equipment grounding conductors.

(4) Where the air space under a raised floor is protected by an automatic fire suppression system, in addition to wiring installed in compliance with 722.135(B), Types CL2R, CL3R, CL4R, CL2, ~~and~~ CL3, and CL4 and substitute cables, including CMP, CMR, CM, and CMG, installed in accordance with 722.135(E) shall be permitted under raised floors.

(5) Where the air space under a raised floor is not protected by an automatic fire suppression system, in addition to wiring installed in compliance with 722.135(B), substitute cable Type CMP installed in accordance with 722.135(E) shall be permitted under raised floors.

(6) Listed Type DP cable having adequate fire-resistant characteristics suitable for use under raised floors of an information technology equipment room.

Informational Note: See CSA "Vertical Flame Test-Cables in Cable Trays" as described in CSA C22.2 No. 0.3, *Test Methods for Electrical Wires and Cables*, for one method of defining resistance to the spread of fire where the damage (char length) of the cable does not exceed 1.5 m (4 ft 11 in.) or "UL Flame Exposure, Vertical Flame Tray Test" in UL 1685, *Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables*. The smoke measurements in the test method are not applicable.

Statement of Problem and Substantiation for Public Input

Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.
Article 722 covers Class 2, Class 3, Class 4, and PLTC cables and treats them all the same. Therefore, Class 4 cables should be added to this list.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 2507-NFPA 70-2023 [Section No. 645.10(A)(2)]

(2) Disconnect Identification.

The remote disconnect means for the control of electronic equipment power and HVAC systems shall be grouped and ~~identified~~ marked . A single means to control both systems shall be permitted.

Statement of Problem and Substantiation for Public Input

The word "identified" is defined in Article 100, and it ultimately means that a product is suitable for the application. It seems that the intent of this requirement is marking, not suitablity.

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Public Input No. 3918-NFPA 70-2023 [Section No. 645.10(B)]

(B) Critical Operations Data Systems.

Remote disconnecting controls shall not be required for critical operations data systems when all of the following conditions are met:

(1) An approved procedure has been established and maintained for removing power and air movement within the room or zone.

(2) Qualified personnel are continuously available to advise emergency responders and to instruct them of disconnecting methods.

(3) A smoke-sensing fire detection system is in place.

Informational Note: See *NFPA 72*, *National Fire Alarm and Signaling Code*, for further information.

(4) An approved fire suppression system suitable for the application is in place.

(5) Cables installed under a raised floor, other than branch-circuit wiring, and power cords are installed in compliance with 645.5(E)(2) or (E)(3), or in compliance with Table 645.10(B).

Table 645.10(B) Cables Installed Under Raised Floors

Cable Type	Applicable Sections
Branch circuits under raised floors	645.5(E)(1)
Supply cords of listed information technology equipment	645.5(E)(2)(1), 300.22(C)
Class 2 and Class 3 remote control, Class 4, and PLTC cables in other spaces used for environmental air (plenums)	722.135(B)
Optical fiber cable in other spaces used for environmental air (plenums)	770.113(C) and Table 770.154(a)
Communications wires and cables, cable routing assemblies, and communications raceways in other spaces used for environmental air (plenums)	800.113(C) and Tables 800.154(a), (b), and (c)
Coaxial CATV and radio distribution cables in other spaces used for environmental air (plenums)	800.113(C) and Table 800.154(a)

Statement of Problem and Substantiation for Public Input

Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.
Article 722 covers Class 2, Class 3, Class 4, and PLTC cables and treats them all the same. Therefore, Class 4 should be added to this list.

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Public Input No. 2776-NFPA 70-2023 [Section No. 645.11]

645.11 Uninterruptible Power Supply (UPS).

UPS systems installed within the information technology equipment room and their supply and output circuits shall comply with 645.10, except for the following installations and constructions:

(1) Installations complying with Article 685, Parts I and ~~II of Article 685~~ II

(2) Power sources limited to 750 volt-amperes or less derived either from UPS equipment or from battery circuits integral to electronic equipment

The disconnecting means shall also disconnect the battery from its load.

Informational Note: See UL 1778, *Uninterruptible Power Systems*, and UL 62368-1, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*, for information on product listings for electronic equipment disconnecting means and backup battery power sources.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Public Input No. 936-NFPA 70-2023 [Section No. 645.11]

645.11 Uninterruptible Power Supply (UPS).

UPS systems installed within the information technology equipment room and their supply and output circuits shall comply with 645.10, except for the following installations and constructions:

(1) Installations complying with Article, 685, Parts I and II ~~of Article 685~~

(2) Power sources limited to 750 volt-amperes or less derived either from UPS equipment or from battery circuits integral to electronic equipment

The disconnecting means shall also disconnect the battery from its load.

Informational Note: See UL 1778, *Uninterruptible Power Systems*, and UL 62368-1, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*, for information on product listings for electronic equipment disconnecting means and backup battery power sources.

Statement of Problem and Substantiation for Public Input

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, “The article number shall precede the part number.”

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 2777-NFPA 70-2023 [Section No. 645.14]

645.14 System Grounding.

Separately derived power systems shall be installed in accordance with Article 250, Parts I and II ~~of Article 250~~ . Power systems derived within listed information technology equipment that supply information technology systems through receptacles or cable assemblies supplied as part of this equipment shall not be considered separately derived for the purpose of applying 250.30.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Public Input No. 2778-NFPA 70-2023 [Section No. 645.15]

645.15 Equipment Grounding and Bonding.

All exposed non-current-carrying metal parts of an information technology system shall be bonded to the equipment grounding conductor in accordance with Article 250, Parts I, V, VI, VII, and ~~VIII of Article 250 or~~ VIII or shall be double insulated. Where signal reference structures are installed, they shall be bonded to the equipment grounding conductor provided for the information technology equipment. Any auxiliary grounding electrode(s) installed for information technology equipment shall be installed in accordance with 250.54.

Informational Note: See 250.146(D) and 406.3(E) for information on isolated grounding-type receptacles.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
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Public Input No. 937-NFPA 70-2023 [Section No. 645.15]

645.15 Equipment Grounding and Bonding.

All exposed non-current-carrying metal parts of an information technology system shall be bonded to the equipment grounding conductor in accordance with Article 250, Parts I, V, VI, VII, and VIII ~~of Article 250~~ or shall be double insulated. Where signal reference structures are installed, they shall be bonded to the equipment grounding conductor provided for the information technology equipment. Any auxiliary grounding electrode(s) installed for information technology equipment shall be installed in accordance with 250.54.

Informational Note: See 250.146(D) and 406.3(E) for information on isolated grounding-type receptacles.

Statement of Problem and Substantiation for Public Input

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, “The article number shall precede the part number.”

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Committee: NEC-P12

Public Input No. 2481-NFPA 70-2023 [Section No. 645.16]

645.16 Marking.

Each unit of an information technology system supplied by a branch circuit shall be provided with a manufacturer's nameplate, which shall also include the input power requirements for voltage, frequency, and maximum rated load in amperes.

Information Note: Information technology and communications equipment are not subject to Article 110.20 or 110.21 for reconditioned equipment when refurbishing operations are done by an authorized entity. See Article 100, Definitions, for a definition of reconditioned.

Statement of Problem and Substantiation for Public Input

Many IT equipment manufacturers offer a resale program for de-installed assets as an environmentally and economically sound alternative to disposal. The resale program is usually part of an end-to-end sustainability solution that enables a circular economy. Even though some of the programs use the word "refurbished," the IT equipment is reconditioned according to the manufacturer's instructions. The original product safety agency labels remain valid when parts that are on the approved bill of materials are used. These parts are included in the product safety agency report and are part of the listing. A product safety label is changed only when it is either damaged or a different model designation must be identified.

Refurbished IT equipment is certified and labelled according to the original listing mark or certified as refurbished at an authorized factory. For example, the primary power supply is either replaced as a subassembly (if non-functional) or retested to ensure it passes routine factory (hipot and ground continuity) testing. All other safety critical parts that are replaced and/or added are only those allowed according to the Listing report. Therefore, IT equipment refurbishing does not introduce new or unique product safety concerns when done according to the manufacturer's instructions.

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Public Input No. 2779-NFPA 70-2023 [Section No. 645.18]

645.18 Surge Protection for Critical Operations Data Systems.

A listed surge-protective device (SPD) shall be installed for critical operations data systems in accordance with ~~Part II of~~ Article 242 , Part II .

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Submittal Date: Thu Aug 24 20:49:53 EDT 2023
Committee: NEC-P12

Public Input No. 938-NFPA 70-2023 [Section No. 645.18]

645.18 Surge Protection for Critical Operations Data Systems.

A listed surge-protective device (SPD) shall be installed for critical operations data systems in accordance with ~~Part II of~~ Article 242 , Part II .

Statement of Problem and Substantiation for Public Input

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, “The article number shall precede the part number.”

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Committee: NEC-P12

Public Input No. 2780-NFPA 70-2023 [Section No. 645.25]

645.25 Engineering Supervision.

As an alternative to the feeder and service load calculations required by Article 220, Parts III and IV ~~of Article 220~~ , feeder and service load calculations for new or existing loads shall be permitted to be used if provided by qualified persons under engineering supervision.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee: NEC-P12

Public Input No. 939-NFPA 70-2023 [Section No. 645.25]

645.25 Engineering Supervision.

As an alternative to the feeder and service load calculations required by Article 220, Parts III and IV ~~of Article 220~~ , feeder and service load calculations for new or existing loads shall be permitted to be used if provided by qualified persons under engineering supervision.

Statement of Problem and Substantiation for Public Input

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, “The article number shall precede the part number.”

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Committee: NEC-P12

Public Input No. 4037-NFPA 70-2023 [Section No. 645.27]

645.27 Selective Coordination.

(A) General.

Critical operations data system(s) overcurrent protective devices shall be selectively coordinated with all supply-side overcurrent protective devices.

Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

(B) Replacements.

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

(C) Modifications.

If modifications, additions, or deletions to the critical operations data system(s) or the normal system supplying the emergency load(s) occur, selective coordination of the critical operations data system(s) OCPDs with all supply-side and load-side OCPDs shall be reevaluated.

Statement of Problem and Substantiation for Public Input

Selective coordination is vital to ensure the reliability of critical operations data systems (CODS). The NEC has established that it is important that selective coordination be maintained throughout the life of the system in Sections 700.32(B) and (C), 701.32(B) and (C), and 708.54(B) and (C).
Selective coordination is achieved and verified based on the specific OCPDs and their ratings and settings and the available fault current at the time of installation. Since selective coordination applies to all supply-side and load-side OCPDs, the OCPDs in the normal system that supply the CODS are included in this evaluation. Therefore, if any OCPD in the CODS system or one of the OCPDs in the normal system supplying the CODS is replaced, it will directly affect whether the system remains selectively coordinated.
Selective coordination should also be reevaluated after the replacement, modification, deletion, or addition of any overcurrent protective devices in the system. Additionally, modifications to supply equipment, including transformers or conductor lengths, may result in changes to the available fault currents throughout the critical operations data system. Therefore, to ensure selective coordination through the life of the system, selective coordination should be re-evaluated after these changes are made.

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Committee: NEC-P12

Public Input No. 4501-NFPA 70-2023 [Section No. 645.27]

645.27 Selective Coordination.

Critical operations data system(s) overcurrent protective devices shall be selectively coordinated with all supply-side overcurrent protective devices for the period of time that a fault's duration extends beyond 0 . 1 second .

Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

Statement of Problem and Substantiation for Public Input

In 2012, NFPA 99 the Technical Committee on Electrical System realized this issue and stated that 4.4.2.1.2.1 Selective Coordination – Overcurrent devices serving the essential electrical systems shall be selectively coordinated down to 0.1 second. This then became part of the National Electrical Code in Article 517.31(G) stating that "Coordination. Overcurrent protective devices serving the essential electrical system shall be coordinated for the period of time that a fault's duration extends beyond 0.1 second."
Health care is a critical system that deemed this to be a safer way to proceed with their electrical systems.

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Public Input No. 2781-NFPA 70-2023 [Section No. 646.3]

646.3 Other Articles.

Circuits and equipment shall comply with 646.3(A) through (M) as applicable. Wherever the requirements of other articles of this *Code* and Article 646 differ, the requirements of Article 646 shall apply.

(A) Spread of Fire or Products of Combustion.

Sections 300.21, 770.26, and 800.26 shall apply to penetrations of a fire-resistant room boundary, if provided.

(B) Wiring and Cabling in Other Spaces Used for Environmental Air (Plenums).

The following sections and tables shall apply to wiring and cabling in other spaces used for environmental air (plenums) within a modular data center space:

(1) Wiring methods: 300.22(C)(1)

(2) Class 2, Class 3, and PLTC cables: 722.135(B)

(3) Fire alarm systems: 760.53(B)(2) and Table 760.154

(4) Optical fiber cables: 770.113(C) and Table 770.154(a)

(5) Communications circuits: 800.113(C) and Table 800.154(a)

(6) CATV and radio distribution systems: 800.113(C) and Table 800.154(a)

Informational Note: Environmentally controlled working spaces, aisles, and equipment areas in an MDC are not considered a plenum.

(C) Grounding and Bonding.

The non-current-carrying conductive members of optical fiber cables in an MDC shall be grounded in accordance with 770.114. Grounding and bonding of communications protectors, cable shields, and non-current-carrying metallic members of cable shall comply with ~~Part IV of~~ Article 805 , Part IV .

(D) Electrical Classification of Data Circuits.

Section 725.60(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits.

(E) Fire Alarm Equipment.

Article 760, Parts I, II, and III ~~of Article 760 shall~~ shall apply to fire alarm systems, cables, and equipment installed in an MDC, where provided. Only fire alarm cables listed in accordance with ~~Part IV of~~ Article 760 ~~and~~ , Part IV and listed fire alarm equipment shall be permitted to be installed in an MDC.

(F) Cable Routing Assemblies and Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110, 800.113, and 800.154 shall apply to cable routing assemblies and communications raceways. Article 800 and 805, Parts I, II, III, IV, and ~~V of Articles 800 and 805 shall~~ V shall apply to communications wires, cables, and equipment installed in an MDC. Only communications wires and cables listed in accordance with 800.179, cable routing assemblies and communications raceways listed in accordance with 800.182, and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an MDC.

Informational Note: See Article 100 for a definition of *communications equipment*.

(G) Community Antenna Television and Radio Distribution Systems Cables and Equipment.

Article 800 and 820, Parts I, II, III, IV, and ~~V of Articles 800 and 820 shall~~ V shall apply to community antenna television and radio distribution systems equipment installed in an MDC. Only community antenna television and radio distribution cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an MDC.

(H) Surge-Protective Devices (SPDs).

Where provided, surge-protective devices shall be listed and labeled and installed in accordance with Part II of Article 242.

(I) Lighting.

Lighting shall be installed in accordance with Parts I through XIV of Article 410.

(J) Power Distribution Wiring and Wiring Protection.

Power distribution wiring and wiring protection within an MDC shall comply with Parts I, II, and III of Article 210 for branch circuits.

(K) Wiring Methods and Materials.

Wiring methods and materials shall comply with the following:

(1) Unless modified elsewhere in this article, wiring methods and materials for power distribution shall comply with Chapter 3. Wiring shall be suitable for its use and installation and shall be listed and labeled.

Exception: This requirement shall not apply to wiring that is part of listed and labeled equipment.

(2) The following wiring methods shall not be permitted:

(3) Integrated gas spacer cable: Type IGS (Article 326)

(4) Concealed knob-and-tube wiring (Article 394)

(5) Messenger-supported wiring (Article 396)

(6) Open wiring on insulators (Article 398)

(7) Outdoor overhead conductors over 600 volts (Article 395)

(8) Wiring in areas under a raised floor that are constructed and used for ventilation as described in 645.5(E) shall be permitted to use the wiring methods described in 645.5(E) if the conditions of 645.4 are met.

(9) Installation of wiring for remote-control, signaling, and power-limited circuits shall comply with Part II of Article 725.

(10) Installation of optical fiber cables shall comply with Part V of Article 770.

(11) Alternate wiring methods as permitted by Article 645 shall be permitted for MDCs, provided that all of the conditions of 645.4 are met.

(L) Service Equipment.

For an MDC that is designed such that it can be powered from a separate electrical service, the service equipment for control and protection of services and their installation shall comply with Parts I, V, VI, and VII of Article 230. The service equipment and their arrangement and installation shall permit the installation of the service-entrance conductors in accordance with Parts I and IV of Article 230. Service equipment shall be listed and labeled and marked as being suitable for use as service equipment.

(M) Disconnecting Means.

An approved means shall be provided to disconnect power to all electronic equipment in the MDC in accordance with 645.10. There shall also be a similar approved means to disconnect the power to all dedicated HVAC systems serving the MDC that shall cause all required fire/smoke dampers to close.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

(F) needs to identify which part of Articles 800 and 805 apply.
(G) needs to identify which part of Articles 800 and 820 apply.

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Committee: NEC-P12

Public Input No. 2782-NFPA 70-2023 [Section No. 646.3]

646.3 Other Articles.

Circuits and equipment shall comply with 646.3(A) through (M) as applicable. Wherever the requirements of other articles of this *Code* and Article 646 differ, the requirements of Article 646 shall apply.

(A) Spread of Fire or Products of Combustion.

Sections 300.21, 770.26, and 800.26 shall apply to penetrations of a fire-resistant room boundary, if provided.

(B) Wiring and Cabling in Other Spaces Used for Environmental Air (Plenums).

The following sections and tables shall apply to wiring and cabling in other spaces used for environmental air (plenums) within a modular data center space:

(1) Wiring methods: 300.22(C)(1)

(2) Class 2, Class 3, and PLTC cables: 722.135(B)

(3) Fire alarm systems: 760.53(B)(2) and Table 760.154

(4) Optical fiber cables: 770.113(C) and Table 770.154(a)

(5) Communications circuits: 800.113(C) and Table 800.154(a)

(6) CATV and radio distribution systems: 800.113(C) and Table 800.154(a)

Informational Note: Environmentally controlled working spaces, aisles, and equipment areas in an MDC are not considered a plenum.

(C) Grounding and Bonding.

The non-current-carrying conductive members of optical fiber cables in an MDC shall be grounded in accordance with 770.114. Grounding and bonding of communications protectors, cable shields, and non-current-carrying metallic members of cable shall comply with Part IV of Article 805.

(D) Electrical Classification of Data Circuits.

Section 725.60(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits.

(E) Fire Alarm Equipment.

Parts I, II, and III of Article 760 shall apply to fire alarm systems, cables, and equipment installed in an MDC, where provided. Only fire alarm cables listed in accordance with Part IV of Article 760 and listed fire alarm equipment shall be permitted to be installed in an MDC.

(F) Cable Routing Assemblies and Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110, 800.113, and 800.154 shall apply to cable routing assemblies and communications raceways. Parts I, II, III, IV, and V of Articles 800 and 805 shall apply to communications wires, cables, and equipment installed in an MDC. Only communications wires and cables listed in accordance with 800.179, cable routing assemblies and communications raceways listed in accordance with 800.182, and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an MDC.

Informational Note: See Article 100 for a definition of *communications equipment*.

(G) Community Antenna Television and Radio Distribution Systems Cables and Equipment.

Parts I, II, III, IV, and V of Articles 800 and 820 shall apply to community antenna television and radio distribution systems equipment installed in an MDC. Only community antenna television and radio distribution cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an MDC.

(H) Surge-Protective Devices (SPDs).

Where provided, surge-protective devices shall be listed and labeled and installed in accordance with ~~Part II of~~ Article 242 , Part II .

(I) Lighting.

Lighting shall be installed in accordance with Article 410, Parts I through XIV ~~of Article 410~~ .

(J) Power Distribution Wiring and Wiring Protection.

Power distribution wiring and wiring protection within an MDC shall comply with Article 210, Parts I, II, and ~~III of Article 210 for~~ III for branch circuits.

(K) Wiring Methods and Materials.

Wiring methods and materials shall comply with the following:

(1) Unless modified elsewhere in this article, wiring methods and materials for power distribution shall comply with Chapter 3. Wiring shall be suitable for its use and installation and shall be listed and labeled.

Exception: This requirement shall not apply to wiring that is part of listed and labeled equipment.

(2) The following wiring methods shall not be permitted:

(3) Integrated gas spacer cable: Type IGS (Article 326)

(4) Concealed knob-and-tube wiring (Article 394)

(5) Messenger-supported wiring (Article 396)

(6) Open wiring on insulators (Article 398)

(7) Outdoor overhead conductors over 600 volts (Article 395)

(8) Wiring in areas under a raised floor that are constructed and used for ventilation as described in 645.5(E) shall be permitted to use the wiring methods described in 645.5(E) if the conditions of 645.4 are met.

(9) Installation of wiring for remote-control, signaling, and power-limited circuits shall comply with Article 725, Part II ~~of Article 725~~ .

(10) Installation of optical fiber cables shall comply with ARTICLE 770, Part V ~~of Article 770~~ .

(11) Alternate wiring methods as permitted by Article 645 shall be permitted for MDCs, provided that all of the conditions of 645.4 are met.

(L) Service Equipment.

For an MDC that is designed such that it can be powered from a separate electrical service, the service equipment for control and protection of services and their installation shall comply with Article 230, Parts I, V, VI, and VII ~~of Article 230~~ . The service equipment and their arrangement and installation shall permit the installation of the service-entrance conductors in accordance with Article 230, Parts I and IV ~~of Article 230~~ . Service equipment shall be listed and labeled and marked as being suitable for use as service equipment.

(M) Disconnecting Means.

An approved means shall be provided to disconnect power to all electronic equipment in the MDC in accordance with 645.10. There shall also be a similar approved means to disconnect the power to all dedicated HVAC systems serving the MDC that shall cause all required fire/smoke dampers to close.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee: NEC-P12

Public Input No. 3227-NFPA 70-2023 [Section No. 646.3]

646.3 Other Articles.

Circuits and equipment shall comply with 646.3(A) through (M) as applicable. Wherever the requirements of other articles of this *Code* and

~~Article 646 differ~~
this article differ , the requirements of

~~Article 646 shall~~
this article shall apply.

(A) Spread of Fire or Products of Combustion.

Sections 300.21, 770.26, and 800.26 shall apply to penetrations of a fire-resistant room boundary, if provided.

(B) Wiring and Cabling in Other Spaces Used for Environmental Air (Plenums).

The following sections and tables shall apply to wiring and cabling in other spaces used for environmental air (plenums) within a modular data center space:

(1) Wiring methods: 300.22(C)(1)

(2) Class 2, Class 3, and PLTC cables: 722.135(B)

(3) Fire alarm systems: 760.53(B)(2) and Table 760.154

(4) Optical fiber cables: 770.113(C) and Table 770.154(a)

(5) Communications circuits: 800.113(C) and Table 800.154(a)

(6) CATV and radio distribution systems: 800.113(C) and Table 800.154(a)

Informational Note: Environmentally controlled working spaces, aisles, and equipment areas in an MDC are not considered a plenum.

(C) Grounding and Bonding.

The non-current-carrying conductive members of optical fiber cables in an MDC shall be grounded in accordance with 770.114. Grounding and bonding of communications protectors, cable shields, and non-current-carrying metallic members of cable shall comply with ~~Part IV of~~ Article 805, Part IV .

(D) Electrical Classification of Data Circuits.

Section 725.60(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits.

(E) Fire Alarm Equipment.

Article 760, Parts I, II, and III ~~of Article 760 shall~~ shall apply to fire alarm systems, cables, and equipment installed in an MDC, where provided. Only fire alarm cables listed in accordance with ~~Part IV of~~ Article 760 ~~and~~ , Part IV and listed fire alarm equipment shall be permitted to be installed in an MDC.

(F) Cable Routing Assemblies and Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110, 800.113, and 800.154 shall apply to cable routing assemblies and communications raceways. Articles 800 and 805, Parts I, II, III, IV, and V ~~of Articles 800 and 805 shall~~ , shall apply to communications wires, cables, and equipment installed in an MDC. Only communications wires and cables listed in accordance with 800.179, cable routing assemblies and communications raceways listed in accordance with 800.182, and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an MDC.

Informational Note: See Article 100 for a definition of *communications equipment*.

(G) Community Antenna Television and Radio Distribution Systems Cables and Equipment.

Articles 800 and 820, Parts I, II, III, IV, and V ~~of Articles 800 and 820 shall~~ , shall apply to community antenna television and radio distribution systems equipment installed in an MDC. Only community antenna television and radio distribution cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an MDC.

(H) Surge-Protective Devices (SPDs).

Where provided, surge-protective devices shall be listed and labeled and installed in accordance with ~~Part II of~~ Article 242, Part II .

(I) Lighting.

Lighting shall be installed in accordance with Article 410, Parts I through XIV ~~of Article 410~~ .

(J) Power Distribution Wiring and Wiring Protection.

Power distribution wiring and wiring protection within an MDC shall comply with ~~Parts I, II, and III of Article 210 for branch circuits~~ the branch circuit requirements stated elsewhere in this Code .

(K) Wiring Methods and Materials.

Wiring methods and materials shall comply with the following:

(1) Unless modified elsewhere in this article, wiring methods and materials for power distribution shall comply with Chapter 3. Wiring shall be suitable for its use and installation and shall be listed and labeled.

Exception: This requirement shall not apply to wiring that is part of listed and labeled equipment.

(2) The following wiring methods shall not be permitted:

(3) Integrated gas spacer cable: Type IGS (Article 326)

(4) Concealed knob-and-tube wiring (Article 394)

(5) Messenger-supported wiring (Article 396)

(6) Open wiring on insulators (Article 398)

(7) Outdoor overhead conductors over 600 volts (Article 395)

(8) Wiring in areas under a raised floor that are constructed and used for ventilation as described in 645.5(E) shall be permitted to use the wiring methods described in 645.5(E) if the conditions of 645.4 are met.

(9) Installation of wiring for remote-control, signaling, and power-limited circuits shall comply with ~~Part II of~~ Article 725, Part II .

(10) Installation of optical fiber cables shall comply with ~~Part V of~~ Article 770, Part V .

(11) Alternate wiring methods as permitted by Article 645 shall be permitted for MDCs, provided that all of the conditions of 645.4 are met.

(L) Service Equipment.

For an MDC that is designed such that it can be powered from a separate electrical service, the service equipment for control and protection of services and their installation shall comply with Article 230, Parts I, V, VI, and VII ~~of Article 230~~ . The service equipment and their arrangement and installation shall permit the installation of the service-entrance conductors in accordance ~~with~~ with Article 230, Parts I and IV ~~of Article 230~~ . Service equipment shall be listed and labeled and marked as being suitable for use as service equipment.

(M) Disconnecting Means.

An approved means shall be provided to disconnect power to all electronic equipment in the MDC in accordance with 645.10. There shall also be a similar approved means to disconnect the power to all dedicated HVAC systems serving the MDC that shall cause all required fire/smoke dampers to close.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. Furthermore, it directs these references to appear with the article first, followed by the part where parts are specified. Revisions are proposed for this section to comply with these requirements, though some instances have been left as is "for context", including the references to the articles listed for the prohibited wiring methods, and the references to Chapter 8 articles since per 90.3, those articles stand alone so the pointers to those specific rules appears appropriate in this section.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 3921-NFPA 70-2023 [Section No. 646.3(B)]

(B) Wiring and Cabling in Other Spaces Used for Environmental Air (Plenums).

The following sections and tables shall apply to wiring and cabling in other spaces used for environmental air (plenums) within a modular data center space:

(1) Wiring methods: 300.22(C)(1)

(2) Class 2, Class 3, Class 4, and PLTC cables: 722.135(B)

(3) Fire alarm systems: 760.53(B)(2) and Table 760.154

(4) Optical fiber cables: 770.113(C) and Table 770.154(a)

(5) Communications circuits: 800.113(C) and Table 800.154(a)

(6) CATV and radio distribution systems: 800.113(C) and Table 800.154(a)

Informational Note: Environmentally controlled working spaces, aisles, and equipment areas in an MDC are not considered a plenum.

Statement of Problem and Substantiation for Public Input

Class 4 systems were added in the 2023 code and have equivalent or better than fire and life safety requirements as Class 2 circuits. An effort to analyze all the locations of Class 2 in the code to see if Class 4 was also appropriate in the application should have happened for the 2023 code and not doing it was an oversight.
Article 722 covers Class 2, Class 3, Class 4, and PLTC cables and treats them all the same. Therefore, Class 4 should be added to this list.

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 941-NFPA 70-2023 [Section No. 646.3(C)]

(C) Grounding and Bonding.

The non-current-carrying conductive members of optical fiber cables in an MDC shall be grounded in accordance with 770.114. Grounding and bonding of communications protectors, cable shields, and non-current-carrying metallic members of cable shall comply with ~~Part IV of~~ Article 805 , Part III .

Statement of Problem and Substantiation for Public Input

The reference to Article 805 was corrected, and brought into compliance with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Public Input No. 942-NFPA 70-2023 [Section No. 646.3(E)]

(E) Fire Alarm Equipment.

Article 760, Parts I, II, and III ~~of Article 760~~ shall apply to fire alarm systems, cables, and equipment installed in an MDC, where provided. Only fire alarm cables listed in accordance with ~~Part IV of~~ Article 760 , Part IV and listed fire alarm equipment shall be permitted to be installed in an MDC.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Submittal Date: Mon Jun 05 10:06:30 EDT 2023
Committee: NEC-P12

Public Input No. 943-NFPA 70-2023 [Section No. 646.3(F)]

(F) Cable Routing Assemblies and Communications Wires, Cables, Raceways, and Equipment.

Sections 800.110, 800.113, and 800.154 shall apply to cable routing assemblies and communications raceways. Article 800, Parts I, II, III, and IV, and ~~V of Articles 800 and~~ 805 Articles 805, Parts I, II, III and IV, shall apply to communications wires, cables, and equipment installed in an MDC. Only communications wires and cables listed in accordance with 800.179, cable routing assemblies and communications raceways listed in accordance with 800.182, and communications equipment listed in accordance with 800.171 shall be permitted to be installed in an MDC.

Informational Note: See Article 100 for a definition of *communications equipment*.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide
the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted.
The article number shall precede the part number.

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Public Input No. 944-NFPA 70-2023 [Section No. 646.3(G)]

(G) Community Antenna Television and Radio Distribution Systems Cables and Equipment.

Article 800, Parts I, II, III, and IV, and ~~V of Articles 800 and 820~~ Article 820, Parts I and V, shall apply to community antenna television and radio distribution systems equipment installed in an MDC. Only community antenna television and radio distribution coaxial cables listed in accordance with 800.179 and listed CATV equipment shall be permitted to be installed in an MDC.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide
the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted.
The article number shall precede the part number.

All CATV cables are coaxial cables, so "coaxial" was added for clarity.

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Public Input No. 945-NFPA 70-2023 [Section No. 646.3(H)]

(H) Surge-Protective Devices (SPDs).

Where provided, surge-protective devices shall be listed and labeled and installed in accordance with Article 22, Part II ~~of Article 242~~ .

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Committee: NEC-P12

Public Input No. 946-NFPA 70-2023 [Section No. 646.3(I)]

(I) Lighting.

Lighting shall be installed in accordance with Article 410, Parts I through XIV ~~of Article 410~~ .

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Public Input No. 947-NFPA 70-2023 [Section No. 646.3(J)]

(J) Power Distribution Wiring and Wiring Protection.

Power distribution wiring and wiring protection within an MDC shall comply with branch circuit requirements in Article 210, Parts I, II, and III ~~of Article 210 for branch circuits~~ .

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Public Input No. 948-NFPA 70-2023 [Section No. 646.3(K)]

(K) Wiring Methods and Materials.

Wiring methods and materials shall comply with the following:

(1) Unless modified elsewhere in this article, wiring methods and materials for power distribution shall comply with Chapter 3. Wiring shall be suitable for its use and installation and shall be listed and labeled.

Exception: This requirement shall not apply to wiring that is part of listed and labeled equipment.

(2) The following wiring methods shall not be permitted:

(3) Integrated gas spacer cable: Type IGS (Article 326)

(4) Concealed knob-and-tube wiring (Article 394)

(5) Messenger-supported wiring (Article 396)

(6) Open wiring on insulators (Article 398)

(7) Outdoor overhead conductors over 600 volts (Article 395)

(8) Wiring in areas under a raised floor that are constructed and used for ventilation as described in 645.5(E) shall be permitted to use the wiring methods described in 645.5(E) if the conditions of 645.4 are met.

(9) Installation of wiring for remote-control, signaling, and power-limited circuits shall comply with ~~Part II of Article~~ ~~725~~ Article 722, Part I, and Article 725, Part I and II .

(10) Installation of optical fiber cables shall comply with ~~Part V of~~ Article 770 , Part V .

(11) Alternate wiring methods as permitted by Article 645 shall be permitted for MDCs, provided that all of the conditions of 645.4 are met.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Committee: NEC-P12

Public Input No. 949-NFPA 70-2023 [Section No. 646.3(L)]

(L) Service Equipment.

For an MDC that is designed such that it can be powered from a separate electrical service, the service equipment for control and protection of services and their installation shall comply with Parts I, V, VI, and VII of Article 230. The service equipment and their arrangement and installation shall permit the installation of the service-entrance conductors in accordance with Article 230, Parts I and IV ~~of Article 230~~ . Service equipment shall be listed and labeled and marked as being suitable for use as service equipment.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Public Input No. 940-NFPA 70-2023 [Section No. 646.3 [Excluding any Sub-Sections]]

Circuits and equipment shall comply with 646.3(A) through (M) as applicable. Wherever the requirements of other articles of this *Code* and this Article ~~646~~ differ, the requirements of this Article ~~646~~ shall apply.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The recommended text is in accordance with one of the examples in 4.1.4:

Incorrect:
525.3(A) Portable Wiring and Equipment. Wherever the requirements of other articles of this Code and Article 525 differ, the requirements of Article 525 shall apply to the portable wiring and equipment.

Correct:
525.3(A) Portable Wiring and Equipment. Wherever the requirements of other articles of this Code and this article differ, the requirements of this article shall apply to the portable wiring and equipment.

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Public Input No. 2784-NFPA 70-2023 [Section No. 646.5]

646.5 Nameplate Data.

A permanent nameplate shall be attached to each equipment enclosure of an MDC and shall be plainly visible after installation. The nameplate shall include the following information, as applicable:

(1) Supply voltage, number of phases, frequency, and full-load current. The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth, require oversized conductors or permit reduced-size conductors, the required capacity shall be included in the marked full-load current. Where more than one incoming supply circuit is to be provided, the nameplate shall state the preceding information for each circuit. For listed equipment, the full-load current shown on the nameplate shall be permitted to be the maximum, measured, 15-minute, average full-load current.

Informational Note No. 1: See 430.22(E) and 430.26 for duty cycle requirements.

(2) For MDCs powered by a separate service, the short-circuit current rating of the service equipment provided as part of the MDC.

Informational Note No. 2: This rating may be part of the service equipment marking.

(3) For MDCs powered by a separate service, if the required service as determined by Article 220, Parts III and ~~IV of Article 220 is~~ IV is less than the rating of the service panel used, the required service shall be included on the nameplate. As an alternative to the feeder and service load calculations required by Article 220, Parts III and IV ~~of Article 220~~ , feeder and service load calculations for new, future, or existing loads shall be permitted to be used if performed by qualified persons under engineering supervision.

Informational Note No. 3: Branch circuits supplying ITE loads are assumed to be loaded not less than 80 percent of the branch-circuit rating with a 100 percent duty cycle.

(4) Electrical diagram number(s) or the number of the index to the electrical drawings.

(5) For MDC equipment enclosures that are not powered by a separate service, feeder, or branch circuit, a reference to the powering equipment.

(6) Manufacturer's name or trademark.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee:	NEC-P12

Public Input No. 950-NFPA 70-2023 [Section No. 646.5]

646.5 Nameplate Data.

A permanent nameplate shall be attached to each equipment enclosure of an MDC and shall be plainly visible after installation. The nameplate shall include the following information, as applicable:

(1) Supply voltage, number of phases, frequency, and full-load current. The full-load current shown on the nameplate shall not be less than the sum of the full-load currents required for all motors and other equipment that may be in operation at the same time under normal conditions of use. Where unusual type loads, duty cycles, and so forth, require oversized conductors or permit reduced-size conductors, the required capacity shall be included in the marked full-load current. Where more than one incoming supply circuit is to be provided, the nameplate shall state the preceding information for each circuit. For listed equipment, the full-load current shown on the nameplate shall be permitted to be the maximum, measured, 15-minute, average full-load current.

Informational Note No. 1: See 430.22(E) and 430.26 for duty cycle requirements.

(2) For MDCs powered by a separate service, the short-circuit current rating of the service equipment provided as part of the MDC.

Informational Note No. 2: This rating may be part of the service equipment marking.

(3) For MDCs powered by a separate service, if the required service as determined by Article 220, Parts III and IV ~~of Article 220~~ is less than the rating of the service panel used, the required service shall be included on the nameplate. As an alternative to the feeder and service load calculations required by Article 220, Parts III and IV ~~of Article 220~~, feeder and service load calculations for new, future, or existing loads shall be permitted to be used if performed by qualified persons under engineering supervision.

Informational Note No. 3: Branch circuits supplying ITE loads are assumed to be loaded not less than 80 percent of the branch-circuit rating with a 100 percent duty cycle.

(4) Electrical diagram number(s) or the number of the index to the electrical drawings.

(5) For MDC equipment enclosures that are not powered by a separate service, feeder, or branch circuit, a reference to the powering equipment.

(6) Manufacturer's name or trademark.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Public Input No. 2806-NFPA 70-2023 [Section No. 646.9]

646.9 Flexible Power Cords and Cables for Connecting Equipment Enclosures of an MDC System.

(A) Uses Permitted.

Flexible power cords and cables shall be permitted to be used for connections between equipment enclosures of an MDC system where not subject to physical damage. Where flexible power cords or cables are used, they shall be listed as suitable for extra-hard usage. Where used outdoors, flexible power cords and cables shall also be listed as suitable for wet locations and shall be sunlight resistant.

Informational Note: One example of flexible power cord usage for connections between equipment enclosures of an MDC system is between an MDC enclosure containing only servers and one containing power distribution equipment.

(B) Uses Not Permitted.

Flexible power cords and cables shall not be used for connection to external sources of power.

Informational Note: Examples of external sources of power are electrical services, feeders, and premises branch circuits.

~~**(D)**~~

(C) ~~Listing.~~

~~Where flexible power cords or cables are used, they shall be listed as suitable for extra-hard usage. Where used outdoors, flexible power cords and cables shall also be listed as suitable for wet locations and shall be sunlight resistant.~~

Single-Conductor Cable.

Single-conductor power cable shall be permitted to be used only in sizes 2 AWG or larger.

Statement of Problem and Substantiation for Public Input

The (C) language was deleted and relocated to the (A) text. A separate (C) for "Listing" is not necessary, as it would only apply if permitted in (A).

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Public Input No. 2785-NFPA 70-2023 [Section No. 646.10]

646.10 Electrical Supply and Distribution.

Equipment used for electrical supply and distribution in an MDC, including fittings, devices, luminaires, apparatus, machinery, and the like, shall comply with Article 110, Parts I and II ~~of Article 110~~ .

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Submittal Date: Thu Aug 24 21:03:27 EDT 2023
Committee: NEC-P12

Public Input No. 2786-NFPA 70-2023 [Section No. 646.11]

646.11 Distribution Transformers.

(A) Utility-Owned Transformers.

Utility-owned distribution transformers shall not be permitted in an MDC.

(B) Non-Utility-Owned Premises Transformers.

Non-utility-owned premises distribution transformers installed in the vicinity of an MDC shall be of the dry type or the type filled with a noncombustible dielectric medium. Such transformers shall be installed in accordance with Article 450, Parts I and II ~~of Article 450~~ . Non-utility-owned premises distribution transformers shall not be permitted in an MDC.

(C) Power Transformers.

Power transformers that supply power only to the MDC shall be permitted to be installed in the MDC equipment enclosure. Only dry-type transformers shall be permitted to be installed in the MDC equipment enclosure. Such transformers shall be installed in accordance with Article 450, Parts I, II, and III ~~of Article 450~~ .

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

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Committee: NEC-P12

Public Input No. 951-NFPA 70-2023 [Section No. 646.11(B)]

(B) Non-Utility-Owned Premises Transformers.

Non-utility-owned premises distribution transformers installed in the vicinity of an MDC shall be of the dry type or the type filled with a noncombustible dielectric medium. Such transformers shall be installed in accordance with Artice 450, Parts I and II ~~of Article 450~~ . Non-utility-owned premises distribution transformers shall not be permitted in an MDC.

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Committee: NEC-P12

Public Input No. 3271-NFPA 70-2023 [Section No. 646.11(C)]

(C) Power Transformers.

Power transformers that supply power only to the MDC shall be permitted to be installed in the MDC equipment enclosure. Only dry-type transformers shall be permitted to be installed in the MDC equipment enclosure. Such transformers shall be installed in accordance with Article 450, Parts I ~~, II, and III of Article~~ 450 and II .

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. Referencing all parts of an article is essentially referencing the entire article. When looking at Article 450, we see that Part III is really not relevant to this requirement as it is the Transformer Vaults part of the article. As such, it is suggested that we delete the reference to Part III. Additionally, I've moved the parts referenced to follow the Article number, in compliance with this section of the Style Manual.

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Committee: NEC-P12

Public Input No. 952-NFPA 70-2023 [Section No. 646.11(C)]

(C) Power Transformers.

Power transformers that supply power only to the MDC shall be permitted to be installed in the MDC equipment enclosure. Only dry-type transformers shall be permitted to be installed in the MDC equipment enclosure. Such transformers shall be installed in accordance with Article 450, Parts I, II, and III ~~of Article 450~~ .

Statement of Problem and Substantiation for Public Input

The recommended text complies with Section 4.1.4 of the 2023 NEC Style Manual which states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

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Public Input No. 2788-NFPA 70-2023 [Section No. 650.3]

650.3 Other Articles.

Installations of circuits and equipment shall comply with 650.3(A) and (B) as applicable. Wherever the requirements of other articles in Chapters 1 through 7 of this *Code* and ~~Article 650 differ~~ this article differ , the requirements of ~~Article 650 shall~~ this article shall apply.

(A) Electronic Organ Equipment.

Installations of digital/analog–sampled sound production technology and associated audio signal processing, amplification, reproduction equipment, and wiring installed as part of a pipe organ shall be in accordance with Article 640.

(B) Optical Fiber Cable.

Installations of optical fiber cables shall be in accordance with Article 770, Parts I and V ~~of Article 770~~ .

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 4.1.4, regarding the use of Parts.
4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

The reference to Article 640 needs to include which part or part of the article apply.

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Public Input No. 929-NFPA 70-2023 [Section No. 650.3(A)]

(A) Electronic Organ Equipment.

Installations of digital/analog–sampled sound production technology and associated audio signal processing, amplification, reproduction equipment, and wiring installed as part of a pipe organ shall be in accordance with Article 640, Parts I and II .

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the 2023 NEC Style Manual states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The applicable parts of Article 640, Audio Signal Processing, Amplification, and Reproduction Equipment, are Part I, General and Part II, Permanent Audio System Installations.

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Public Input No. 927-NFPA 70-2023 [Section No. 650.3(B)]

(B) Optical Fiber Cable.

Installations of optical fiber cables shall be in accordance with Article 770, Parts I and V ~~of Article 770~~ .

Statement of Problem and Substantiation for Public Input

The references to other Articles have been revised to comply with the 2023 NEC Style Manual section 4.1.4 which states, “The article number shall precede the part number.”

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Public Input No. 3272-NFPA 70-2023 [Section No. 650.3 [Excluding any Sub-Sections]]

Installations of circuits and equipment shall comply with 650.3(A) and (B) as applicable. Wherever the requirements of other articles in Chapters 1 through 7 of this *Code* and ~~Article 650~~ - this article differ, the requirements of ~~Article 650 shall~~ htis article shall apply.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In terms of the charging text of this article, it is suggested that changing the reference to Article 650 to "this article" will satisfy the requirement in the Style Manual. The reference in (A) to Article 640 is proposed to stay as is "for context".

Submitter Information Verification

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Committee: NEC-P12

Public Input No. 930-NFPA 70-2023 [Section No. 650.3 [Excluding any Sub-Sections]]

Installations of circuits and equipment shall comply with 650.3(A) and (B) as applicable. Wherever the requirements of other articles in Chapters 1 through 7 of this *Code* and this Article ~~650~~ ~~differ~~ , the requirements of this Article ~~650~~ shall apply.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the 2023 NEC Style Manual states:

4.1.4 References to an Entire Article. References shall not be made to an entire article, except for the Article 100 or where referenced to provide the necessary context. References to specific parts within articles shall be permitted. References to all parts of an article shall not be permitted. The article number shall precede the part number.

The recommended text is in accordance with one of the examples in 4.1.4:

"Incorrect:
525.3(A) Portable Wiring and Equipment. Wherever the requirements of other articles of this Code and Article 525 differ, the requirements of Article 525 shall apply to the portable wiring and equipment.

Correct:
525.3(A) Portable Wiring and Equipment. Wherever the requirements of other articles of this Code and this article differ, the requirements of this article shall apply to the portable wiring and equipment."

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Submittal Date: Mon Jun 05 04:21:34 EDT 2023
Committee: NEC-P12

Public Input No. 928-NFPA 70-2023 [Section No. 650.6(D)]

(D) Cable Covering.

Each cable shall be provided with an outer covering, either overall or on each of any subassemblies of grouped conductors. Tape shall be permitted in place of a covering. Where not installed in metal raceway, the covering shall be resistant to flame spread, or the cable or each cable subassembly shall be covered with a closely wound listed fireproof tape.

Informational Note: See UL 2556~~-2015~~ , *Wire, Cables and Cable Test Methods*, for one method of determining that cable is resistant to flame spread by testing the cable to the FV-2/VW-1 Test.

Statement of Problem and Substantiation for Public Input

The edition date for the UL standard has been deleted because it is not needed. Section 90.5(C) in the 2023 NEC states “Unless the standard reference includes a date, the reference is to be considered as the latest edition of the standard.”

Submitter Information Verification

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Submittal Date: Mon Jun 05 04:00:38 EDT 2023
Committee: NEC-P12

Public Input No. 1780-NFPA 70-2023 [Section No. 660.4(C)]

~~(C) Over 1000 Volts, Nominal.~~

~~Circuits and equipment operated at more than 1000 volts, nominal, shall comply with Article 490.~~

Statement of Problem and Substantiation for Public Input

Article 490 does not exist in the 2023 NEC.

Submitter Information Verification

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Submittal Date: Wed Aug 02 02:07:27 EDT 2023
Committee: NEC-P12

Public Input No. 3273-NFPA 70-2023 [Section No. 660.4(C)]

(C) Over 1000 Volts, Nominal.

Circuits and equipment operated at more than 1000 volts, nominal, shall comply with Article ~~490~~ 495 .

Statement of Problem and Substantiation for Public Input

It is proposed to leave the reference here to an entire article "for context" and not attempt to change this language to comply with Section 4.1.4 of the Style Manual, other than to correct the reference to Article 495. This information was moved from 490 to 495 in the 2023 Edition and this reference should have been corrected for correlation.

Submitter Information Verification

Submitter Full Name: Richard Holub
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Submittal Date: Thu Aug 31 08:15:25 EDT 2023
Committee: NEC-P12

Public Input No. 3415-NFPA 70-2023 [Section No. 660.4(C)]

(C) Over 1000 Volts, Nominal.

Circuits and equipment operated at more than 1000 volts, nominal, shall comply with Article ~~490~~ 495 .

Statement of Problem and Substantiation for Public Input

Article 490 was renumbered to 495. This edit is to correct the Article number.

Submitter Information Verification

Submitter Full Name: Mathher Abbassi
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Submittal Date: Sat Sep 02 18:05:29 EDT 2023
Committee: NEC-P12

Public Input No. 2614-NFPA 70-2023 [Section No. 660.10]

660. ~~10~~ **3 Reconditioned** Equipment - ~~Installations~~ **.**

All equipment for new X-ray installations and all used or reconditioned X-ray equipment moved to and reinstalled at a new location shall be of an approved type.

Statement of Problem and Substantiation for Public Input

This Public Input is being submitted on behalf of the NEC Correlating Committee Usability Task Group in order to provide correlation throughout the document. The text is revised to to comply with the NEC Style Manual Section 2.2.1 regarding reconditioned equipment.
2.2.1 Parallel Numbering Required. Technical committees shall use the following section numbers for the same purposes within articles. This requirement shall not apply to Articles 90, 100, and 110. If the article does not contain listing or reconditioning requirements, the subdivisions shall not be included in the article.
Required Parallel Numbering Format
XXX.1 Scope.
XXX.2 Listing Requirements.
XXX.3 Reconditioned Equipment.
XXX.3(A) Permitted to be Installed.
XXX.3(B) Not Permitted to be Installed.
The Usability Task Group members are: Derrick Atkins, David Hittinger, Richard Holub, Dean Hunter, Chad Kennedy and David Williams.

Submitter Information Verification

Submitter Full Name: David Williams
Organization: Delta Charter Township
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 23 20:16:23 EDT 2023
Committee: NEC-P12

Public Input No. 1781-NFPA 70-2023 [Section No. 660.35]

~~**660.35** General.~~

~~Transformers and capacitors that are part of an X-ray equipment shall not be required to comply with Articles 450 and 460.~~

Statement of Problem and Substantiation for Public Input

660.35 is redundant. It should be dleted to comply with section 4.1.1 of the NEC Style Manual which states:

General requirements contained in Chapters 1 through 4 shall not be repeated in other articles of the document.

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
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City:
State:
Zip:
Submittal Date: Wed Aug 02 02:16:04 EDT 2023
Committee: NEC-P12

Public Input No. 3275-NFPA 70-2023 [Section No. 668.15]

668.15 Grounding.

For equipment, apparatus, and structural components that are required to be grounded in accordance with ~~Article~~ ~~668~~ this article , Article 250, Part III, for a local grounding electrode system shall apply, except a water pipe electrode shall not be required to be used. Any electrode or combination of electrodes described in 250.52 shall be permitted.

Statement of Problem and Substantiation for Public Input

Section 4.1.4 of the NEC(r) Style Manual prohibits referencing an entire article with the exception of Article 100 or where required for context. In the case of this text, a simple revision to "this article" will address the Style Manual requirement without changing the intent of the requirement.

Submitter Information Verification

Submitter Full Name: Richard Holub
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Submittal Date: Thu Aug 31 08:45:30 EDT 2023
Committee: NEC-P12

Public Input No. 3278-NFPA 70-2023 [Section No. 670.1]

670.1 Scope.

This article covers the nameplate data for, overvoltage protection for, and the size and overcurrent protection of supply conductors to industrial machinery. Industrial Machinery includes robotic equipment, automated mobile platforms (AMPs), autonomous mobile robots (AMRs) and industrial mobile robots (IMRs).

Informational Note No. 1: See NFPA 79, *Electrical Standard for Industrial Machinery*, for further information.

Informational Note No. 2: See 110.26 for information on the workspace requirements for equipment containing supply conductor terminals.

Informational Note No. 3: See NFPA 79, *Electrical Standard for Industrial Machinery*, for information on the workspace requirements for machine power and control equipment.

Statement of Problem and Substantiation for Public Input

In order to clarify that Article 670 applies to robotic equipment, in various forms, the scope was revised to indicate those products that may not be automatically included when considering industrial machinery. Integration of these robotic products may have implications in the final use environment thus the requirements in Article 670 should be considered, and this change clarifies that relationship.

Submitter Information Verification

Submitter Full Name: Peter Hoogerdijk
Organization: UL Solutions
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City:
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Zip:
Submittal Date: Thu Aug 31 10:24:37 EDT 2023
Committee: NEC-P12

Public Input No. 3429-NFPA 70-2023 [Section No. 670.1]

670.1 Scope.

This article covers the nameplate data for, ~~overvoltage~~ surge protection for, and the size and overcurrent protection of supply conductors to industrial machinery.

Informational Note No. 1: See NFPA 79, *Electrical Standard for Industrial Machinery*, for further information.

Informational Note No. 2: See 110.26 for information on the workspace requirements for equipment containing supply conductor terminals.

Informational Note No. 3: See NFPA 79, *Electrical Standard for Industrial Machinery*, for information on the workspace requirements for machine power and control equipment.

Statement of Problem and Substantiation for Public Input

This public input replaces the term “overvoltage” with “surge” to keep this rule consistent with the title of all other sections of the code covering surge protection. This includes but is not limited to sections 215.18, 225.42, 230.67, 409.70, 501.35, 502.35, 620.51(E), 645.18, 695.15, 700.8, and 708.20(D). There is a correlating input for 670.6.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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Submittal Date: Sat Sep 02 20:41:22 EDT 2023
Committee: NEC-P12

Public Input No. 1392-NFPA 70-2023 [New Section after 670.3(A)]

TITLE OF NEW CONTENT

Type your content here ...

Industrial Equipment is to be listed and/or evaluated by an independent third party for safety in materials and construction

Statement of Problem and Substantiation for Public Input

Safety of the equipment can be assured in an industrial facility without examination by the AHJ and aid in approval of installations

Submitter Information Verification

Submitter Full Name: Adam Pluer
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City:
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Submittal Date: Wed Jul 12 16:27:33 EDT 2023
Committee: NEC-P12

Public Input No. 2206-NFPA 70-2023 [Section No. 670.5(B)]

(B) Available ~~Short-Circuit Current~~ Fault Current Field Marking.

Industrial machinery shall be legibly marked in the field with the available fault current. The field marking(s) shall include the date the available fault current calculation was performed and be of sufficient durability to withstand the environment involved.

Statement of Problem and Substantiation for Public Input

In the 2020 NEC, the term short circuit current was changed to fault current. This public input corrects the title to use the correct term "available fault current".

Submitter Information Verification

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Submittal Date: Mon Aug 14 15:29:53 EDT 2023
Committee: NEC-P12

Public Input No. 2162-NFPA 70-2023 [Section No. 670.6]

670.6 ~~Overvoltage~~ Surge Protection.

Industrial machinery with safety circuits shall have ~~overvoltage~~ surge protection.

Statement of Problem and Substantiation for Public Input

All surge protective devices are over voltage protection devices but not all over voltage protective devices are surge protective devices. The following types of over voltage protective devices exist on the market: Phase Overvoltage (ANSI 59P), Neutral over voltage (ANSI 59N), negative-sequence over voltage (ANSI 59-2), Surge Protective Devices. The requirements of this section pertains only to surge protection and not other types of over voltage protection. This change adds clarity as to what is required.

Submitter Information Verification

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City:
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Submittal Date: Mon Aug 14 10:19:24 EDT 2023
Committee: NEC-P12

Public Input No. 3430-NFPA 70-2023 [Section No. 670.6]

670.6 ~~Overvoltage~~ Surge Protection.

Industrial machinery with safety circuits shall have ~~overvoltage~~ surge protection.

Statement of Problem and Substantiation for Public Input

This public input replaces the term “overvoltage” with “surge” to keep this rule consistent with the title of all other sections of the code covering surge protection. This includes but is not limited to sections 215.18, 225.42, 230.67, 409.70, 501.35, 502.35, 620.51(E), 645.18, 695.15, 700.8, and 708.20(D). There is a correlating input for 670.6.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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City:
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Submittal Date: Sat Sep 02 20:43:16 EDT 2023
Committee: NEC-P12

Public Input No. 1821-NFPA 70-2023 [New Part after II.]

625.7 System Installation

The construction, installation, testing, operation and maintenance of equipment, associated wiring, and interconnections of EVSE, EVPE, and WPTE shall be performed only by qualified persons.

Statement of Problem and Substantiation for Public Input

Do to the unique hazards presented by these technologies, the language should be uniform amongst all articles in emerging technologies. The use and requirement of "qualified persons" is inconsistent from article to article, resulting in the responsibility of the qualified person differing from system to system. Throughout the country, sections and portions of each system are NOT being performed by qualified persons and the argument for those performing the work is based on the language or lack there of total inclusion of all "parts" of the system. Installation by definition is the act of installing and can be broken down into individual components, while construction is the act of constructing a total structure.
This addition will more align with the article 100 definition as referenced and will promote a uniform application of documents as mandated per the style manual, while promoting a more standard formal interpretation of what portion of the work shall be performed by a qualified person.
This change will also conform this language to NFPA 70E and NFPA 70B as referenced throughout this document.

This article has changed from only covering Electric Vehicle Supply Equipment to now covering all Electric Vehicle Power Transfer Equipment, specifically Electric Vehicle Power Export Equipment that will be capable of bidirectional energy flow and requires compliance with both Article 702 and Article 705.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1817-NFPA 70-2023 [Section No. 690.4(C)]	
Public Input No. 1818-NFPA 70-2023 [Section No. 691.4]	
Public Input No. 1819-NFPA 70-2023 [Section No. 692.4(C)]	
Public Input No. 1820-NFPA 70-2023 [Section No. 694.7 [Excluding any Sub-Sections]]	

Submitter Information Verification

Submitter Full Name: George Mostardini
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City:
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Zip:
Submittal Date: Sat Aug 05 14:26:18 EDT 2023
Committee: NEC-P12

Public Input No. 1753-NFPA 70-2023 [Part II.]

~~**Part II.** Equipment Construction~~

Statement of Problem and Substantiation for Public Input

We agree with NEMA in their Public Input that the entire Part II related to Equipment Construction is unnecessary and duplication of the requirement in 625.6 for EVPTSE to be listed, and appropriate reference to the product standards in Annex A Table A.1(a) per NEC Style Manual 4.2.1, and 4.2.2.x.x. If our PI re 625.1 (PI-1752 and 1754) is accepted then it is unnecessary to have Part II. Further, we would argue that it is unenforceable to have cord, and Personnel Protection System, criteria in the NEC when they are already in product standards for listed equipment, thus in violation of NEC Style manual 3.2.1. The NEC Correlating Committee adopted the 2023 NEC Style Manual in Apr 2023. Per NEC Style Manual 3.2.5.4, product testing should be left to a "Qualified Electrical Testing Laboratory" testing and listing in accordance with the referenced product standard in Table A.1(a).

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 1754-NFPA 70-2023 [Section No. 625.6]	This requires listed product, in accordance with Table A.1(a) and any discrepancy with those standards would be a conflict.
Public Input No. 1752-NFPA 70-2023 [Section No. 625.1]	The product standards listed as Informational Notes list some but not all the product standards that will be duplicated by this Part.

Submitter Information Verification

Submitter Full Name: Kevin Cheong
Organization: Chargepoint Canada Inc.
Affiliation: ChargePoint Inc.
Street Address:
City:
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Zip:
Submittal Date: Mon Jul 31 19:12:22 EDT 2023
Committee: NEC-P12

Public Input No. 1843-NFPA 70-2023 [Section No. 610.14(G)]

(G) Nameplate.

Each crane, monorail, or hoist shall be provided with a visible nameplate marked with the manufacturer's name, rating in volts, frequency, number of phases, and circuit amperes as calculated in 610.14(E) and (F). Cranes shall be listed.

Statement of Problem and Substantiation for Public Input

Would ease the AHJ in inspection the installation.

Submitter Information Verification

Submitter Full Name: Adam Pluer
Organization: City of Wauwatosa
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 06 12:06:22 EDT 2023
Committee: NEC-P12