



Public Comment No. 2217-NFPA 70-2018 [Global Input]

The Correlating Committee directs Panel 12 to review all references to Article 310 under their purview. Article 310 has been divided into Article 310,
Conductors for General Wiring, and Article 311, Medium Voltage Conductors and Cables for usability and clarity. Panel 12 shall appoint a task group
to review all necessary references to verify their accuracy and submit Public Comments where necessary. This action instructs Panel 12 to
submit a Public Comment(s) within the time frame required in the NEC schedule.
This action shall be considered as a public comment.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_270.pdf	CN_270

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 270 in the First Draft Report.

The Correlating Committee directs Panel 12 to review all references to Article 310 under their purview. Article 310 has been divided into Article 310,

Conductors for General Wiring, and Article 311, Medium Voltage Conductors and Cables for usability and clarity. Panel 12 shall appoint a task group

to review all necessary references to verify their accuracy and submit Public Comments where necessary. This action instructs Panel 12 to

submit a Public Comment(s) within the time frame required in the NEC schedule.

This action shall be considered as a public comment.

Related Item

- Correlating Committee Note No. 270

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submission Date: Fri Sep 07 14:04:12 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7763-NFPA 70-2018

Statement:

Reference to table 310.104(A) was changed to 310.4(A) to align with reorganization of article 310 and to correct the reference.

**Correlating Committee Note No. 270-NFPA 70-2018 [Global Input]****Submitter Information Verification**

Submitter Full Name: Sarah Caldwell

Committee:

Submittal Date: Fri May 11 17:54:55 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs all panels to review all references to Article 310 under their purview. Article 310 has been divided into Article 310, Conductors for General Wiring, and Article 311, Medium Voltage Conductors and Cables for usability and clarity. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit Public Comments where necessary. This action instructs the referenced panels to submit a Public Comment(s) within the time frame required in the NEC schedule.

This action shall be considered as a public comment.

Ballot Results

✔ This item has passed ballot

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 2234-NFPA 70-2018 [Global Input]

The Correlating Committee directs Panel 12 to review all Articles, within their purview, that supplement or modify (90.3) GFCI requirements in 210.8 for correlation, clarity, usability and standardized format. A Correlating Committee Task Group will be appointed and will submit comments where necessary.

This action shall be considered as a public comment.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_152.pdf	CN_152

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 152 in the First Draft Report.

The Correlating Committee directs Panel 12 to review all Articles, within their purview, that supplement or modify (90.3) GFCI requirements in 210.8 for correlation, clarity, usability and standardized format. A Correlating Committee Task Group will be appointed and will submit comments where necessary.

This action shall be considered as a public comment.

Related Item

- Correlating Committee Note No. 152

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Fri Sep 07 15:00:24 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The panel has reviewed the suggestions from the correlating committee and did not find any sections that needed to be revised.



Correlating Committee Note No. 152-NFPA 70-2018 [Global Input]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Thu May 10 18:00:52 EDT 2018

Committee Statement

Committee Statement: The Correlating Committee directs each panel to review all Articles, within their purview, that supplement or modify (90.3) GFCI requirements in 210.8 for correlation, clarity, usability and standardized format. A Correlating Committee Task Group will be appointed and will submit comments where necessary.

This action shall be considered as a public comment.

Ballot Results

✔ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 1424-NFPA 70-2018 [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, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, 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. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, as well as mobile energy storage systems, are not considered electric vehicles. (CMP-12)

Statement of Problem and Substantiation for Public Comment

Energy storage systems (ESS) can be stationary, mobile and portable. Mobile ESS can be used to provide power during or after natural or man-made 'events' as well as for temporary power to address one time peaking events (e.g. fair, PGA event, etc.). While most entities that adopt and document compliance with the NEC would not consider mobile ESS as an electric vehicle, the possibility exists that someone could. Including ESS in the list of what is not considered an EV should eliminate any confusion regarding a mobile ESS being considered an EV.

Related Item

- 8389-NFPA 70-2018

Submitter Information Verification

Submitter Full Name: David Conover

Organization: Pacific Northwest National Lab

Street Address:

City:

State:

Zip:

Submittal Date: Tue Aug 28 13:09:46 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: Definition is clear as written. The term "mobile energy storage systems" has not been defined. The submitter should provide the panel with a definition of a "mobile energy storage system" to be used.

**Public Comment No. 1198-NFPA 70-2018 [Section No. 610.2]**

610.2 Definition.

Festoon Cable.

Single- and multiple-conductor cable intended for use and installation in accordance with Article 610 where flexibility is required.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_171.pdf	70_CN 171

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 171 in the First Draft Report on Public Input No. 1912.

The Correlating Committee directs the panel to take action on PI 1912 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections.

This action will be considered as a public comment.

Related Item

- PI 1912

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Fri Aug 24 11:14:50 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7765-NFPA 70-2018
Statement: This second revision places a new sentence on a line below the subject line. The definition in this section does apply to this article.

The panel appeals to the CC to move all definitions to article 100 and assign a panel responsibilities to each definition.



Correlating Committee Note No. 171-NFPA 70-2018 [Section No. 610.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submittal Date: Fri May 11 09:49:36 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1912 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✔ This item has passed ballot

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 1934-NFPA 70-2018 [Section No. 610.2]

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

Festoon Cable.

Single- and multiple-conductor cable intended for use and installation in accordance with Article 610 where flexibility is required.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1912, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that this definition already applies only within Article 610, therefore the additional language will explicitly share that information with the Code user. Use of the term as defined in this Article in other locations in the Code would be inappropriate, therefore it is important to clearly indicate that its use is confined to the requirements in this Article.

Related Item

- PI 1912

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 30 12:40:27 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:

Resolution: SR-7765-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definition in this section does apply to this article.

The panel appeals to the CC to move all definitions to article 100 and assign a panel responsibilities to each definition.

**Public Comment No. 240-NFPA 70-2018 [Section No. 610.33]****610.33** Rating of Disconnecting Means.

The continuous ampere rating of the switch or circuit breaker required by 610.32 shall not be less than 50 percent of the combined short-time or continuous ampere rating of the motors or less than 75 percent of the sum of the short-time or continuous ampere rating of the motors required for any single motion.

Statement of Problem and Substantiation for Public Comment

Often times cranes have continuous rated motors and continuous (CLASS F) rated cranes that are not addressed.

Related Item

- PI

Submitter Information Verification

Submitter Full Name: Aaron VandenHeuvel

Organization: Magnetek Inc

Street Address:

City:

State:

Zip:

Submittal Date: Thu Jul 19 11:35:12 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but held

Resolution: This comment introduces new material that needs to be processed during the next revision cycle.



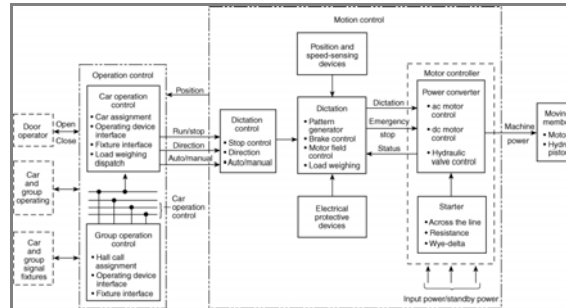
Public Comment No. 1091-NFPA 70-2018 [Section No. 620.2]

620.2 Definitions.

Informational Note No. 1: The motor controller, motion controller, and operation controller are located in a single enclosure or a combination of enclosures.

Informational Note No. 2: Informational Note Figure 620.2, No. 2 is for information only.

Figure Informational Note Figure 620.2, No. 2 Control System.



Control Room (for Elevator, Dumbwaiter).

An enclosed control space outside the hoistway, intended for full bodily entry, that contains the elevator motor controller. The room could also contain electrical and/or mechanical equipment used directly in connection with the elevator or dumbwaiter but not the electric driving machine or the hydraulic machine.

Control Space (for Elevator, Dumbwaiter).

A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, that contains the elevator motor controller. This space could also contain electrical and/or mechanical equipment used directly in connection with the elevator or dumbwaiter but not the electrical driving machine or the hydraulic machine.

Control System.

The overall system governing the starting, stopping, direction of motion, acceleration, speed, and retardation of the moving member.

Controller, Motion.

The electrical device(s) for that part of the control system that governs the acceleration, speed, retardation, and stopping of the moving member.

Controller, Motor.

The operative units of the control system comprised of the starter device(s) and power conversion equipment used to drive an electric motor, or the pumping unit used to power hydraulic control equipment.

Controller, Operation.

The electrical device(s) for that part of the control system that initiates the starting, stopping, and direction of motion in response to a signal from an operating device.

Machine Room (for Elevator, Dumbwaiter).

An enclosed machinery space outside the hoistway, intended for full bodily entry, that contains the electrical driving machine or the hydraulic machine. The room could also contain electrical and/or mechanical equipment used directly in connection with the elevator or dumbwaiter.

Machinery Space (for Elevator, Dumbwaiter, Platform Lift, and Stairway Chairlift).

A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, that contains elevator, dumbwaiter, platform lift, or stairway chairlift equipment, and could also contain equipment used directly in connection with the elevator, dumbwaiter, platform lift, or stairway chairlift.

Operating Device.

The car switch, pushbuttons, key or toggle switch(s), or other devices used to activate the operation controller.

Remote Machine Room and Control Room (for Elevator, Dumbwaiter).

A machine room or control room that is not attached to the outside perimeter or surface of the walls, ceiling, or floor of the hoistway.

Remote Machinery Space and Control Space (for Elevator, Dumbwaiter).

A machinery space or control space that is not within the hoistway, machine room, or control room and that is not attached to the outside perimeter or surface of the walls, ceiling, or floor of the hoistway.

Signal Equipment.

Includes audible and visual equipment such as chimes, gongs, lights, and displays that convey information to the user.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_172.pdf	70_CN 172

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 172 in the First Draft Report on First Revision No. 8214 and Public Input No. 1913.

The Correlating Committee directs the panel to take action on PI 1913 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections.

This action will be considered as a public comment.

Related Item

- FR 8214

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 22 16:12:34 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7767-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definition in this section does apply to this article.

The panel appeals to the CC to move all definitions to article 100 and assign a panel responsibilities to each definition.



Correlating Committee Note No. 172-NFPA 70-2018 [Section No. 620.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submittal Date: Fri May 11 09:50:59 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1913 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

FR-8214-NFPA 70-2018

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



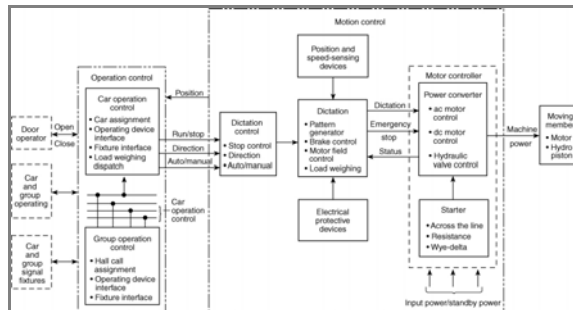
Public Comment No. 1937-NFPA 70-2018 [Section No. 620.2]

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

Informational Note No. 1: The motor controller, motion controller, and operation controller are located in a single enclosure or a combination of enclosures.

Informational Note No. 2: Informational Note Figure 620.2, No. 2 is for information only.

Figure Informational Note Figure 620.2, No. 2 Control System.



Control Room (for Elevator, Dumbwaiter).

An enclosed control space outside the hoistway, intended for full bodily entry, that contains the elevator motor controller. The room could also contain electrical and/or mechanical equipment used directly in connection with the elevator or dumbwaiter but not the electric driving machine or the hydraulic machine.

Control Space (for Elevator, Dumbwaiter).

A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, that contains the elevator motor controller. This space could also contain electrical and/or mechanical equipment used directly in connection with the elevator or dumbwaiter but not the electrical driving machine or the hydraulic machine.

Control System.

The overall system governing the starting, stopping, direction of motion, acceleration, speed, and retardation of the moving member.

Controller, Motion.

The electrical device(s) for that part of the control system that governs the acceleration, speed, retardation, and stopping of the moving member.

Controller, Motor.

The operative units of the control system comprised of the starter device(s) and power conversion equipment used to drive an electric motor, or the pumping unit used to power hydraulic control equipment.

Controller, Operation.

The electrical device(s) for that part of the control system that initiates the starting, stopping, and direction of motion in response to a signal from an operating device.

Machine Room (for Elevator, Dumbwaiter).

An enclosed machinery space outside the hoistway, intended for full bodily entry, that contains the electrical driving machine or the hydraulic machine. The room could also contain electrical and/or mechanical equipment used directly in connection with the elevator or dumbwaiter.

Machinery Space (for Elevator, Dumbwaiter, Platform Lift, and Stairway Chairlift).

A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, that contains elevator, dumbwaiter, platform lift, or stairway chairlift equipment, and could also contain equipment used directly in connection with the elevator, dumbwaiter, platform lift, or stairway chairlift.

Operating Device.

The car switch, pushbuttons, key or toggle switch(s), or other devices used to activate the operation controller.

Remote Machine Room and Control Room (for Elevator, Dumbwaiter).

A machine room or control room that is not attached to the outside perimeter or surface of the walls, ceiling, or floor of the hoistway.

Remote Machinery Space and Control Space (for Elevator, Dumbwaiter).

A machinery space or control space that is not within the hoistway, machine room, or control room and that is not attached to the outside perimeter or surface of the walls, ceiling, or floor of the hoistway.

Signal Equipment.

Includes audible and visual equipment such as chimes, gongs, lights, and displays that convey information to the user.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1913, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 620, therefore the additional language will explicitly share that information with the Code user. Use of the terms as defined in this Article in other locations in the Code would be inappropriate, therefore it is important to clearly indicate that their use is confined to the requirements in this Article.

Related Item

- PI 1913

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 12:47:27 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7767-NFPA 70-2018](#)

Statement: This second revision places a new sentence on a line below the subject line. The definition in this section does apply to this article.

The panel appeals to the CC to move all definitions to article 100 and assign a panel responsibilities to each definition.

**Public Comment No. 1092-NFPA 70-2018 [Section No. 620.6]****620.6** Ground-Fault Circuit-Interrupter Protection for Personnel.

Each 125-volt, single-phase, 15- and 20-ampere receptacle installed in pits, in hoistways, on the cars of elevators and dumbwaiters associated with wind turbine tower elevators, on the platforms or in the runways and machinery spaces of platform lifts and stairway chairlifts, and in escalator and moving walk wellways shall be of the ground-fault circuit-interrupter type.

All 125-volt, single-phase, 15- and 20-ampere receptacles installed in machine rooms, control spaces, machinery spaces, and control rooms shall have ground-fault circuit-interrupter protection for personnel.

A permanently installed sump pump be required to be permanently wired or to be supplied by a single receptacle that is require ground-fault circuit-interrupter protected.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_182.pdf	70_CN 182

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 182 in the First Draft Report on First Revision No. 8322.

The Correlating Committee directs that the panel review and revise the last sentence of 620.6 for clarity and inclusion of mandatory text.

This action will be considered as a public comment.

Related Item

- FR 8322

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submission Date: Wed Aug 22 16:15:20 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7769-NFPA 70-2018

Statement: This language clarifies the mandatory requirements for GFCI protection for personnel within the scope of article 620.



Correlating Committee Note No. 182-NFPA 70-2018 [Section No. 620.85]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Fri May 11 10:06:22 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs that the panel review and revise the last sentence of 620.6 for clarity and inclusion of mandatory text.

This action will be considered as a public comment.

[First Revision No. 8322-NFPA 70-2018 \[Section No. 620.85\]](#)

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1600-NFPA 70-2018 [Section No. 620.6]****620.6** Ground-Fault Circuit-Interrupter Protection for Personnel.

~~Each~~ In addition to the requirements in 210.8, ~~each~~ 125-volt, single-phase, 15- and 20-ampere receptacle installed in pits, in hoistways, on the cars of elevators and dumbwaiters associated with wind turbine tower elevators, on the platforms or in the runways and machinery spaces of platform lifts and stairway chairlifts, and in escalator and moving walk wellways shall be of the ground-fault circuit-interrupter type.

All 125-volt, single-phase, 15- and 20-ampere receptacles installed in machine rooms, control spaces, machinery spaces, and control rooms shall have ground-fault circuit-interrupter protection for personnel.

A permanently installed sump pump be required to be permanently wired or to be supplied by a single receptacle that is require ground-fault circuit-interrupter protected.

Statement of Problem and Substantiation for Public Comment

This Public Comment is the work of an NEC Correlating Committee task group directed to develop standardized text to improve correlation, clarity and usability of the NEC. This effort identified GFCI requirements that supplement or modify the general requirements of 210.8. The present GFCI requirements throughout the NEC were developed by various Technical Committees when the general GFCI requirements in 210.8 were limited to dwelling units. The consequences of time and various committees working to enhance safety have created significant correlation issues with the general requirements in 210.8. The arrangement of the NEC, as detailed in 90.3 clarifies that the general requirements of Chapters 1 through 4 apply "generally to all electrical installations." The work of this Task Group resulted in 41 public comments to provide necessary correlation, clarity and usability. The task group's work was identified in and based upon Correlating Committee Note 152 to the 2020 First Revisions. The Task Group members consisted of Jim Dollard, Chair, Steve Campolo, Donny Cook, Tom Domitrovich, Mark Hilbert, Keith Lofland, Alan Manche and Steve Rood.

Related Item

- CCN 152

Submitter Information Verification

Submitter Full Name: James Dollard

Organization: IBEW Local Union 98

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 12:59:51 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: PC 1600 would add nothing to clarify the requirement.

**Public Comment No. 73-NFPA 70-2018 [Section No. 620.6]****620.6** Ground-Fault Circuit-Interrupter Protection for Personnel.

Each 125-volt, single-phase, 15- and 20-ampere receptacle installed in pits, in hoistways, on the cars of elevators and dumbwaiters associated with wind turbine tower elevators, on the platforms or in the runways and machinery spaces of platform lifts and stairway chairlifts, and in escalator and moving walk wellways shall be of the ground-fault circuit-interrupter type.

All 125-volt, single-phase, 15- and 20-ampere receptacles installed in machine rooms, control spaces, machinery spaces, and control rooms shall have ground-fault circuit-interrupter protection for personnel.

A permanently installed sump pump shall be required to be permanently wired or to be supplied by a single receptacle that is ~~require~~ ground-fault circuit-interrupter protected.

Statement of Problem and Substantiation for Public Comment

I was wrong about the balloted text editing within the body of the FR report section being correct. While the relocation to 620.6 is correct, the wording of the third paragraph is significantly flawed. There is no "shall" requirement term, and the term "require" is nonsense in that location; the previous "required" applies to both acceptable conditions of installation.

Related Item

- 8322

Submitter Information Verification

Submitter Full Name: Scott Cline

Organization: McMurtrey Electric, Inc.

Street Address:

City:

State:

Zip:

Submittal Date: Wed Jun 27 19:32:24 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7769-NFPA 70-2018](#)

Statement: This language clarifies the mandatory requirements for GFCI protection for personnel within the scope of article 620.

**Public Comment No. 1093-NFPA 70-2018 [Section No. 620.21]****620.21 Wiring Methods.**

Conductors, cables, and optical fiber cables located in hoistways, escalator and moving walk wellways, platform lifts, stairway chairlift runways, machinery spaces, control spaces, in or on cars, machine rooms, and control rooms, not including the traveling cables connecting the car or counterweight and hoistway wiring, shall be installed in rigid metal conduit, intermediate metal conduit, electrical metallic tubing, rigid nonmetallic conduit, or wireways, or shall be Type MC, MI, or AC cable unless otherwise permitted in 620.21(A) through (C). Unused conductors in an enclosure shall be insulated or protected from accidental contact with energized circuit components and/or conductors.

Exception: Cords and cables of listed cord- and plug-connected equipment shall not be required to be installed in a raceway.

Informational Note: When an elevator is classified as a fire service access elevator or occupant evacuation operation elevator, some building codes require additional protection for conductors that are located outside of the elevator hoistway and machine room.

(A) Elevators.**(1) Hoistways and Pits.**

(a) Cables used in Class 2 power-limited circuits shall be permitted, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(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):

- (1) Flexible metal conduit.
- (2) Liquidtight flexible metal conduit.
- (3) Liquidtight flexible nonmetallic conduit.
- (4) 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 the following:
 - a. Listed equipment
 - b. Driving machine
 - c. Driving machine brake

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

(d) 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.

(e) 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 A17.1-2016/CSA B44-16, *Safety Code for Elevators and Escalators*.

(2) Cars.

(a) Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit of metric designator 12 (trade size $\frac{3}{8}$), 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 of metric designator 12 (trade size $\frac{3}{8}$), or larger, as defined by 356.2(2), 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 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):

- (1) Flexible metal conduit
- (2) Liquidtight flexible metal conduit
- (3) Liquidtight flexible nonmetallic conduit
- (4) 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 the following:
 - a. Listed equipment
 - b. A driving machine, or
 - c. A driving machine brake

(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 $\frac{3}{8}$), 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 metric designator 12 (trade size $\frac{3}{8}$) or larger, as defined in 356.2(2), 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 the following:

- (1) Listed equipment
- (2) A driving machine, or
- (3) A driving machine brake

(4) Counterweight.

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

- (1) Flexible metal conduit
- (2) Liquidtight flexible metal conduit
- (3) Liquidtight flexible nonmetallic conduit
- (4) 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 the following:
 - a. Listed equipment
 - b. A driving machine, or
 - c. A driving machine brake

(B) Escalators.**(1) Wiring Methods.**

Flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit shall be permitted in escalator and moving walk wellways. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size $\frac{3}{8}$) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size $\frac{3}{8}$), nominal, or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(2) Class 2 Circuit Cables.

Cables used in Class 2 power-limited circuits shall be permitted to be installed within escalators and moving walkways, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(3) Flexible Cords.

Hard-service cords that conform to the requirements of Article 400 (Table 400.4) 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.

(C) Platform Lifts and Stairway Chairlift Raceways.**(1) Wiring Methods.**

Flexible metal conduit or liquidtight flexible metal conduit shall be permitted in platform lifts and stairway chairlift runways and machinery spaces. Flexible metal conduit or liquidtight flexible conduit of metric designator 12 (trade size $\frac{3}{8}$) shall be permitted in lengths not in excess of 1.8 m (6 ft).

Exception: Metric designator 12 (trade size $\frac{3}{8}$) or larger liquidtight flexible nonmetallic conduit, as defined in 356.2(2), shall be permitted to be installed in lengths in excess of 1.8 m (6 ft).

(2) Class 2 Circuit Cables.

Cables used in Class 2 power-limited circuits shall be permitted to be installed within platform lifts and stairway chairlift runways and machinery spaces, provided the cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

(3) Flexible Cords and Cables.

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 in lengths not to exceed 1.8 m (6 ft), provided the cords and cables are supported and protected from physical damage and are of a jacketed and flame-retardant type.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_187.pdf	70 _CN 187

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 187 in the First Draft Report on First Revision No. 8240.

The Correlating Committee directs that this first revision be rewritten to comply with the NEC Style Manual with regard to use of "and/or".

This action will be considered as a public comment.

Related Item

- FR 8240

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submission Date: Wed Aug 22 16:16:59 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7770-NFPA 70-2018

Statement: The panel removed the term "energized circuit components and/or conductors" and was replaced with the term "exposed live parts" in order to remove the ambiguity of "and/or". Other revisions were made to the lists in order to conform with the NEC Style Manual.



Correlating Committee Note No. 187-NFPA 70-2018 [Section No. 620.21

[Excluding any Sub-Sections]]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Fri May 11 10:15:32 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs that this first revision be rewritten to comply with the NEC Style Manual with regard to use of "and/or".

This action will be considered as a public comment.

First Revision No. 8240-NFPA 70-2018 [Section No. 620.21 [Excluding any Sub-Sections]]

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1094-NFPA 70-2018 [Section No. 620.22(A)]****(A) Car Light Receptacles, Auxiliary Lighting, and Ventilation.**

A separate branch circuit shall supply the car lights. The car light(s) branch circuit is permitted to supply receptacle(s), accessory equipment (alarm devices/bells, monitoring devices not part of the control system), auxiliary lighting power source, 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.

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

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_188.pdf	70_CN 188

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 188 in the First Draft Report on First Revision No. 8255.

The Correlating Committee directs that this First Revision be revised to comply with the NEC Style Manual with respect to mandatory text, and the use of "(s)" and the use of "/".

The Correlation Committee directs that the panel review the last sentence of the first paragraph and provide clarity with respect to the phrase "and accessible to qualified persons" with respect to the usability of this requirement limiting such access.

This action will be considered as a public comment.

Related Item

- FR 8255

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submission Date: Wed Aug 22 16:19:11 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7771-NFPA 70-2018

Statement: This revision makes editorial changes to conform with the NEC Style Manual and clarifies the intent of requiring overcurrent devices for equipment in this section to be accessible to qualified persons only.



Correlating Committee Note No. 188-NFPA 70-2018 [Section No. 620.22(A)]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Fri May 11 10:18:19 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs that this First Revision be revised to comply with the NEC Style Manual with respect to mandatory text, and the use of "(s)" and the use of "/".

The Correlation Committee directs that the panel review the last sentence of the first paragraph and provide clarity with respect to the phrase "and accessible to qualified persons" with respect to the usability of this requirement limiting such access.

This action will be considered as a public comment.

First Revision No. 8255-NFPA 70-2018 [Section No. 620.22(A)]

Ballot Results

✔ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 2005-NFPA 70-2018 [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,~~ listed surge protection shall be provided.

Statement of Problem and Substantiation for Public Comment

NEII does not feel that a legally required system load or a critical operation power system load should require surge protection. The loss of these systems would not be a life safety issue.

Related Item

- FR 8267

Submitter Information Verification

Submitter Full Name: Jeffrey Blain

Organization: Schindler Elevator Corporation

Affiliation: National Elevator Industry Inc. (NEII)

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 14:34:51 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: CMP-12 reaffirms its position that surge protection for elevators is necessary for emergency systems, legally required systems, and critical operations power systems to ensure the reliability necessary for these critical loads.

**Public Comment No. 586-NFPA 70-2018 [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, ~~or~~ a legally required system load, ~~or a critical operation power system load, listed~~ listed surge protection shall be provided.

Statement of Problem and Substantiation for Public Comment

The electric utility industry recognizes the value in protecting the systems and devices used in emergency and legally required loads from the potential damage caused by transients, especially where those systems are life-critical. While the ideal protections would be those that are an integral part of the design and manufacture of the devices within these systems, providing overall protection for the systems adds protection for those devices lacking this internally, and should increase the overall system reliability accordingly. With respect to Article 620, there are elevators, chair lifts, etc., that are designated as emergency, and as legally-required, loads, but they are not typically considered critical operation loads. Critical Operations Power systems are already covered in Article 708 therefore adding this in Article 620 is redundant and not necessary.

Related Item

- FR-8267

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 13 11:05:13 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: CMP-12 reaffirms its position that surge protection for elevators is necessary for emergency systems, legally required systems, and critical operations power systems to ensure the reliability necessary for these critical loads.



Public Comment No. 1472-NFPA 70-2018 [Article 625]

Article 625 Electric Vehicle Power Transfer System Charging and Discharging System

Part I. General

625.1 Scope.

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

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

Informational Note No. 2: UL 2594-2013, *Standard for Electric Vehicle Supply Equipment*, is a safety standard for conductive electric vehicle supply equipment. UL 2202-2009, *Standard for Electric Vehicle Charging System Equipment*, is a safety standard for conductive electric vehicle charging equipment.

625.2 Definitions.

Cable Management System.

An apparatus designed to control and organize the output cable to the electric vehicle or to the primary pad.

Charger Power Converter.

The device used to convert energy from the power grid to a high-frequency output for wireless power transfer.

Electric Vehicle Connector.

A device that, when electrically coupled (conductive or inductive) to an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of power transfer and information exchange. This device is part of the electric vehicle coupler.

Informational Note: For further information, see 625.48 for interactive systems.

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the vehicle, that is used to provide power to external loads using the vehicle as the source of supply.

Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment may be contained in one piece of equipment, sometimes referred to as a bidirectional EVSE.

Electric Vehicle Storage Battery.

A battery, comprised of one or more rechargeable electrochemical cells, that has no provision for the release of excessive gas pressure during normal charging and operation, or for the addition of water or electrolyte for external measurements of electrolyte-specific gravity.

Electric Vehicle Supply Equipment (EVSE).

The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric 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. The EVSE can also contain electric vehicle power export equipment (EVPE) to achieve bidirectional power transfer.

Fastened in Place.

Mounting means of equipment in which the fastening means are specifically designed to permit periodic removal, without the use of a tool, for relocation, interchangeability, maintenance, or repair.

Fixed in Place.

Mounting means of an EVSE attached to a wall or surface with fasteners that require a tool to be removed.

Output Cable to the Electric Vehicle.

An assembly consisting of a length of flexible EV cable and an electric vehicle connector (supplying power to the electric vehicle).

Output Cable to the Primary Pad.

A multi-conductor, shielded cable assembly consisting of conductors to carry the high-frequency energy and any status signals between the charger power converter and the primary pad.

Personnel Protection System.

A system of personnel protection devices and constructional features that when used together provide protection against electric shock of personnel.

Portable (as applied to EVSE).

A device intended for indoor or outdoor use that can be carried from charging location to charging location and is designed to be transported in the vehicle when not in use.

Power-Supply Cord.

An assembly consisting of an attachment plug and length of flexible cord that connects equipment to a receptacle.

Primary Pad.

A device external to the EV that provides power via the contactless coupling and may include the charger power converter.

Wireless Power Transfer (WPT).

The transfer of electrical energy from a power source to an electrical load via electric and magnetic fields or waves by a contactless inductive means between a primary and a secondary device.

Wireless Power Transfer Equipment (WPTE).

Equipment consisting of a charger power converter and a primary pad. The two devices are either separate units or contained within one enclosure.

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, and 1000 volts and dc system voltages of up to 1000 volts shall be used to supply equipment covered by this article.

625.5 Listed.

All electric vehicle power transfer system equipment shall be listed.

Part II. Equipment Construction**625.17 Cords and Cables.****(A) Power-Supply Cord.**

The cable for cord-connected equipment 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)(a) or, for 8 AWG and larger, in the 60°C columns of Table 400.5(A)(b).
- (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 stationary 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 Vehicle.

The output cable to the electric vehicle 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: For information and listing requirements for electric vehicle supply equipment, see UL 2594-2016, *Standard for Electric Vehicle Supply Equipment*, and UL 2202-2009, *Standard for Electric Vehicle (EV) Charging System 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 electric vehicle supply equipment is fastened in place, the usable length of the output cable shall be measured from the cable exit of the electric vehicle supply equipment to the face of the electric vehicle connector.

(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.

The equipment 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 supplies less than 60 volts dc.

Part III. Installation**625.40 Electric Vehicle Branch Circuit.**

Each outlet installed for the purpose of charging electric vehicles shall be supplied by an individual branch circuit. Each circuit shall have no other outlets.

625.41 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying EVSE, including bidirectional EVSE, and WPTE shall be sized for continuous duty and shall have a 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 rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

625.42 Rating.

The power transfer equipment 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. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.

Adjustable settings shall only be allowed on fixed-in-place equipment. 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 with sufficient durability to withstand the environment involved on the rating label. Electric vehicle supply equipment with restricted access to an ampere adjusting means shall be permitted to have an ampere rating(s) that is equal to the adjusted current setting. Sizing the service and feeder to match the adjusting means is allowed. Restricted access shall prevent the user from gaining access to the adjusting means. Examples of restricted access are as follows:

- (1) Removable cover or door that is secured by screw(s) or bolt(s) and must be removed to access the adjusting means
- (2) Bolted equipment enclosure doors
- (3) Locked doors accessible only to qualified personnel
- (4) Password protected commissioning software accessible only to qualified personnel

625.43 Disconnecting Means.

For EVSE, including bidirectional 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. 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
- (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 250 volts, single phase, 30 or 50 amperes
- (4) A nonlocking, 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

(C) Fixed 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 Systems.

EVSE 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, evaluated for use with the specific electric vehicles, and marked as suitable for that purpose. When used as an optional standby system, the requirements of Article 702 shall apply; when used as an electric power production source, the requirements of Article 705 shall apply. EVPE that consists of a receptacle outlet only shall be in accordance with 625.60.

Informational Note: For further information on supply equipment, see ANSI/UL 1741, *Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources*, and ANSI/UL 9741, *Bidirectional Electric Vehicle (EV) Charging System Equipment*; for vehicle interactive systems, see SAE J3072, *Standard for Interconnection Requirements for Onboard, Utility-Interactive Inverter Systems*.

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)(a) or Table 625.52(B)(1)(b), the minimum ventilation requirements shall be as specified in Table 625.52(B)(1)(a) or Table 625.52(B)(1)(b) for each of the total number of electric vehicles that can be charged at one time.

Table 625.52(B)(1)(a) Minimum Ventilation Required in Cubic Meters per Minute (m³/min) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

Branch-Circuit Ampere Rating	Branch-Circuit Voltage								
	Single Phase					3 Phase			
	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)(b) 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 Ampere Rating	Branch-Circuit Voltage								
	Single Phase					3 Phase			
	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)(a) or Table 625.52(B)(1)(b), 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 (m³/min) =

$$\frac{(\text{volts})(\text{amperes})}{1718} \quad [625.52(\text{B})(2)]$$

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

$$\frac{(\text{volts})(\text{amperes})}{48.7} \quad [625.52(\text{B})(2)]$$

(2) Three-phase ac:

Ventilation_{3-phase} in cubic meters per minute (m³/min) =

$$\frac{1.732(\text{volts})(\text{amperes})}{1718} \quad [625.52(\text{B})(2)]$$

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

$$\frac{1.732(\text{volts})(\text{amperes})}{48.7} \quad [625.52(\text{B})(2)]$$

(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 (F).

(A) Type.

The receptacle outlet shall be a listed grounding-type receptacle.

(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 integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48.

(D) GFCI Protection for Personnel.

All receptacle outlets shall have ground-fault circuit-interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.

(E) On-Board Inverters.

The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48.

(F) Marking.

Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.

Part IV. Wireless Power Transfer Equipment**625.101 Grounding.**

The primary pad base plate shall be of a non-ferrous metal and shall be grounded 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) Type.**

The charger power converter, where integral to the primary pad, shall comply with 625.102(C). The charger power converter, if not integral to the primary pad, shall be provided with a minimum Type 3R enclosure rating.

(B) General.

If the charger power converter is not integral to the primary pad, it shall be mounted at a height of 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 charger power converter 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 on the surface, embedded in the surface of the floor with its top flush with the surface, or embedded in the surface of the floor with its top below the surface. This includes primary pad constructions with the charger power converter located in the primary pad enclosure.

- (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 located on or above the surface.

- (2) The enclosure shall be provided with a suitable enclosure rating minimum Type 3. If the primary pad is located in an area subject to severe climatic conditions (e.g., flooding), it shall be suitably rated for those conditions or be provided with a suitably rated enclosure.

(D) Protection of Output Cable.

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 the charger power converter is a part of the primary pad assembly, the power supply cord to the primary pad shall also be protected.

(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 Comment

This proposed title could imply various power transfer devices, electrical, mechanical, and electromechanical, both off-board and on-board. The title is so broad that it may cause confusion to readers. The contents of the Article are about wiring and equipment for charging and discharging of electric vehicles. The title should be specific and should not be too broad.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]	

Related Item

- FR-8383-NFPA 70-2018 • Public Input No. 2458-NFPA 70-2017 [Article 625]

Submitter Information Verification

Submitter Full Name: Nancy Stone
Organization: American Honda Motor
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 28 18:38:57 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected
Resolution: The title is by necessity a very short and general statement. The scope statement of 625.1 is the actual description of the subject which the article covers. The language of the scope very clearly limits the purpose of the article. Title is clear as written.



Public Comment No. 75-NFPA 70-2018 [Section No. 625.1]

625.1 Scope.

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

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

Informational Note No. 2: UL 2594-2013, *Standard for Electric Vehicle Supply Equipment*, is a safety standard for conductive electric vehicle supply equipment. UL 2202-2009, *Standard for Electric Vehicle Charging System Equipment*, is a safety standard for conductive electric vehicle charging equipment.

Statement of Problem and Substantiation for Public Comment

I believe that this article is intended to apply to any one of the three types of EV power transfer systems. For more accurate syntax, change the word “and” at the end of the first sentence to “or” to eliminate a possible misinterpretation.

Related Item

- 8385

Submitter Information Verification

Submitter Full Name: Scott Cline

Organization: McMurtrey Electric, Inc.

Street Address:

City:

State:

Zip:

Submittal Date: Wed Jun 27 19:40:01 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:

Resolution: [SR-7776-NFPA 70-2018](#)

Statement: The panel recognizes that the scope is under the purview of the CC. Changing “and” to “or” resolves the possible misinterpretation. Panel rejects PC 1475 but recognizes concerns. By elimination of the word “external” the panel is recognizing that EVPE equipment directly interfaces with on-board electric vehicle equipment. The Code has authority over such interfaces similar to Flexible Cords & Flexible Cables (Article 400), Attachment Plugs (Article 406), and Generators (Article 445).

**Public Comment No. 1095-NFPA 70-2018 [Section No. 625.2]****625.2 Definitions.****Cable Management System.**

An apparatus designed to control and organize the output cable to the electric vehicle or to the primary pad.

Charger Power Converter.

The device used to convert energy from the power grid to a high-frequency output for wireless power transfer.

Electric Vehicle Connector.

A device that, when electrically coupled (conductive or inductive) to an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of power transfer and information exchange. This device is part of the electric vehicle coupler.

Informational Note: For further information, see 625.48 for interactive systems.

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the vehicle, that is used to provide power to external loads using the vehicle as the source of supply.

Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment may be contained in one piece of equipment, sometimes referred to as a bidirectional EVSE.

Electric Vehicle Storage Battery.

A battery, comprised of one or more rechargeable electrochemical cells, that has no provision for the release of excessive gas pressure during normal charging and operation, or for the addition of water or electrolyte for external measurements of electrolyte-specific gravity.

Electric Vehicle Supply Equipment (EVSE).

The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric 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. The EVSE can also contain electric vehicle power export equipment (EVPE) to achieve bidirectional power transfer.

Fastened in Place.

Mounting means of equipment in which the fastening means are specifically designed to permit periodic removal, without the use of a tool, for relocation, interchangeability, maintenance, or repair.

Fixed in Place.

Mounting means of an EVSE attached to a wall or surface with fasteners that require a tool to be removed.

Output Cable to the Electric Vehicle.

An assembly consisting of a length of flexible EV cable and an electric vehicle connector (supplying power to the electric vehicle).

Output Cable to the Primary Pad.

A multi-conductor, shielded cable assembly consisting of conductors to carry the high-frequency energy and any status signals between the charger power converter and the primary pad.

Personnel Protection System.

A system of personnel protection devices and constructional features that when used together provide protection against electric shock of personnel.

Portable (as applied to EVSE).

A device intended for indoor or outdoor use that can be carried from charging location to charging location and is designed to be transported in the vehicle when not in use.

Power-Supply Cord.

An assembly consisting of an attachment plug and length of flexible cord that connects equipment to a receptacle.

Primary Pad.

A device external to the EV that provides power via the contactless coupling and may include the charger power converter.

Wireless Power Transfer (WPT).

The transfer of electrical energy from a power source to an electrical load via electric and magnetic fields or waves by a contactless inductive means between a primary and a secondary device.

Wireless Power Transfer Equipment (WPTE).

Equipment consisting of a charger power converter and a primary pad. The two devices are either separate units or contained within one enclosure.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_174.pdf	70 _CN 174

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 174 in the First Draft Report on First Revision Nos. 8420, 8597 & 8397.

The Correlating Committee directs the panel to take action on PI 2242 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections.

This action will be considered as a public comment.

Related Item

• FR 8420 • FR 8597 • FR 8397

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submission Date: Wed Aug 22 16:21:38 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7779-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 174-NFPA 70-2018 [Section No. 625.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submittal Date: Fri May 11 09:58:20 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 2242 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

[FR-8420-NFPA 70-2018](#)

[FR-8597-NFPA 70-2018](#)

[FR-8397-NFPA 70-2018](#)

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1940-NFPA 70-2018 [Section No. 625.2]**

625.2 Definitions. The following definitions shall apply only within this article.

Cable Management System.

An apparatus designed to control and organize the output cable to the electric vehicle or to the primary pad.

Charger Power Converter.

The device used to convert energy from the power grid to a high-frequency output for wireless power transfer.

Electric Vehicle Connector.

A device that, when electrically coupled (conductive or inductive) to an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of power transfer and information exchange. This device is part of the electric vehicle coupler.

Informational Note: For further information, see 625.48 for interactive systems.

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the vehicle, that is used to provide power to external loads using the vehicle as the source of supply.

Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment may be contained in one piece of equipment, sometimes referred to as a bidirectional EVSE.

Electric Vehicle Storage Battery.

A battery, comprised of one or more rechargeable electrochemical cells, that has no provision for the release of excessive gas pressure during normal charging and operation, or for the addition of water or electrolyte for external measurements of electrolyte-specific gravity.

Electric Vehicle Supply Equipment (EVSE).

The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric 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. The EVSE can also contain electric vehicle power export equipment (EVPE) to achieve bidirectional power transfer.

Fastened in Place.

Mounting means of equipment in which the fastening means are specifically designed to permit periodic removal, without the use of a tool, for relocation, interchangeability, maintenance, or repair.

Fixed in Place.

Mounting means of an EVSE attached to a wall or surface with fasteners that require a tool to be removed.

Output Cable to the Electric Vehicle.

An assembly consisting of a length of flexible EV cable and an electric vehicle connector (supplying power to the electric vehicle).

Output Cable to the Primary Pad.

A multi-conductor, shielded cable assembly consisting of conductors to carry the high-frequency energy and any status signals between the charger power converter and the primary pad.

Personnel Protection System.

A system of personnel protection devices and constructional features that when used together provide protection against electric shock of personnel.

Portable (as applied to EVSE).

A device intended for indoor or outdoor use that can be carried from charging location to charging location and is designed to be transported in the vehicle when not in use.

Power-Supply Cord.

An assembly consisting of an attachment plug and length of flexible cord that connects equipment to a receptacle.

Primary Pad.

A device external to the EV that provides power via the contactless coupling and may include the charger power converter.

Wireless Power Transfer (WPT).

The transfer of electrical energy from a power source to an electrical load via electric and magnetic fields or waves by a contactless inductive means between a primary and a secondary device.

Wireless Power Transfer Equipment (WPTE).

Equipment consisting of a charger power converter and a primary pad. The two devices are either separate units or contained within one enclosure.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 2242, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 625, therefore the additional language will explicitly share that information with the Code user. Use of the terms as defined in this Article in other locations in the Code would be inappropriate, therefore it is important to clearly indicate that their use is confined to the requirements in this Article.

Related Item

- PI 2242

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 12:49:40 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7779-NFPA 70-2018](#)

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Public Comment No. 1473-NFPA 70-2018 [Definition: Electric Vehicle Connector.]

Electric Vehicle Connector.

A device that, when electrically coupled (conductive or inductive) to an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of power transfer and information exchange.
~~This device is part of the electric vehicle coupler.~~

Informational Note: For further information, see 625.48 for interactive systems.

Statement of Problem and Substantiation for Public Comment

The definition of electric vehicle coupler is proposed to be removed. The last sentence of this definition is not needed anymore. It is therefore suggested that the last sentence be removed.

Related Item

- FR-8410-NFPA 70-2018

Submitter Information Verification

Submitter Full Name: Nancy Stone

Organization: American Honda Motor

Street Address:

City:

State:

Zip:

Submittal Date: Tue Aug 28 18:45:30 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Accepted

Resolution: SR-7787-NFPA 70-2018

Statement: The definition of electric vehicle coupler has been removed, because of that, the last sentence of this definition is not needed anymore.



Public Comment No. 1096-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the vehicle, that is used to provide power to external loads using the vehicle as the source of supply.

Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment may be contained in one piece of equipment, sometimes referred to as a bidirectional EVSE.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_191.pdf	70_CN 191

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 191 in the First Draft Report on First Revision No. 8597.

The Correlating Committee directs the panel to revise the Informational Note to comply with the NEC Style Manual relative to the use of the permissive word "may".

This action will be considered as a public comment.

The Correlating Committee directs that this first revision be sent to CMP-1 for information.

Related Item

- FR 8597

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 22 16:25:59 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7783-NFPA 70-2018](#)

Statement: The word "electrical" is added to eliminate the misinterpretation of including other forms of power export.

Added voltage limits to clarify the voltage levels to be included. This was added to harmonize with SAE documents and FMVSS 305.

The info note is edited to replace the improper words "may be" with "are sometimes", and to remove the inappropriate term "a".

The Code has authority over such interfaces similar to Flexible Cords & Flexible Cables

(Article 400), Attachment Plugs (Article 406), and Generators (Article 445).



Correlating Committee Note No. 191-NFPA 70-2018 [New Definition after

Definition: Electric Vehicle Storage B...]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Fri May 11 11:05:06 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to revise the Informational Note to comply with the NEC Style Manual relative to the use of the permissive word "may".

This action will be considered as a public comment.

The Correlating Committee directs that this first revision be sent to CMP-1 for information.

First Revision No. 8597-NFPA 70-2018 New Definition after Definition: Electric Vehicle Storage B...

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the vehicle, that is used to provide power to external loads using the vehicle as the source of supply.

~~Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment may be contained in one piece of equipment, sometimes referred to as a bidirectional EVSE.~~

Statement of Problem and Substantiation for Public Comment

The proposed definition is in direct conflict with Article 625.1 and 90.2 which clearly states that the scope of the NEC is limited to the equipment external to vehicles. Furthermore, the proposed definitions that include vehicle equipment is in direct conflict with NHTSA's broad authority to regulate and enforce vehicle safety which includes the Federal Motor Vehicle Safety Standards intended to reduce deaths and injuries from electrical shock. Additionally, the proposed definition of EVPE is overly broad. This may be interpreted to cover a wide range of devices, including but not limited to: an inverter regardless of off-board or on-board, an EVSE that works for reverse power flow from a vehicle, an AC outlet regardless of off-board or on-board, a DC 12 V outlet, and a USB socket as a 5 V power outlet. Technical requirements considerably differ from device to device, and it is not appropriate to simply define those devices in a single term and holistically discuss those devices. Until the discussion about the necessity and appropriateness of setting requirements for those devices becomes mature, it is suggested that this definition be deleted from the Article.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 1472-NFPA 70-2018 [Article 625]	
Public Comment No. 1477-NFPA 70-2018 [Definition: Electric Vehicle Supply Equipment (EVSE).]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	
Public Comment No. 1482-NFPA 70-2018 [Section No. 625.60]	
Public Comment No. 1477-NFPA 70-2018 [Definition: Electric Vehicle Supply Equipment (EVSE).]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	
Public Comment No. 1482-NFPA 70-2018 [Section No. 625.60]	

Related Item

- FR-8211-NFPA 70-2018
- FR-8385-NFPA 70-2018
- FR-8597-NFPA 70-2018
- Public Input No. 2444-NFPA 70-2017 [New Definition after Definition: Electric Vehicle Storage B...]

Submitter Information Verification

Submitter Full Name: Nancy Stone
Organization: American Honda Motor
Street Address:
City:
State:
Zip:
Submission Date: Tue Aug 28 18:49:28 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:

Resolution: [SR-7776-NFPA 70-2018](#)

Statement: The panel recognizes that the scope is under the purview of the CC. Changing “and” to “or” resolves the possible misinterpretation. Panel rejects PC 1475 but recognizes concerns. By elimination of the word “external” the panel is recognizing that EVPE equipment directly interfaces with on-board electric vehicle equipment. The Code has authority over such interfaces similar to Flexible Cords & Flexible Cables (Article 400), Attachment Plugs (Article 406), and Generators (Article 445).



Public Comment No. 1567-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the vehicle, that is used to provide power to external loads using the vehicle as the source of supply.

Informational Note:- ~~Electric-~~ Some manufacturers include both electric vehicle power export equipment and electric vehicle supply equipment ~~may be contained in one piece of equipment within a single enclosure~~, sometimes referred to as a 'bidirectional EVSE.'

Statement of Problem and Substantiation for Public Comment

There is an apparent Style Manual violation regarding the use of "may" in the informational note. This re-wording of that note should reconcile that violation.

Related Item

• CC Note #191 • FR-8597

Submitter Information Verification

Submitter Full Name: Karl Reighard
Organization: Delmarva Power and Light
Affiliation: Edison Electric Institute (EEI)
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 29 11:57:56 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7783-NFPA 70-2018

Statement: The word "electrical" is added to eliminate the misinterpretation of including other forms of power export.

Added voltage limits to clarify the voltage levels to be included. This was added to harmonize with SAE documents and FMVSS 305.

The info note is edited to replace the improper words "may be" with "are sometimes", and to remove the inappropriate term "a".

The Code has authority over such interfaces similar to Flexible Cords & Flexible Cables (Article 400), Attachment Plugs (Article 406), and Generators (Article 445).



Public Comment No. 1578-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]

Electric Vehicle Power Export Equipment (EVPE).

The equipment, including the outlet on the vehicle, that is used to provide electrical power to external loads using the vehicle as the source of supply source when the electrical power output is greater than or equal to 60V DC or greater than or equal to 30 V AC .

Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment may be contained in one piece of equipment, sometimes referred to as a bidirectional EVSE.

Statement of Problem and Substantiation for Public Comment

Vehicles today commonly provide mechanical power output to external devices, so the definition needs to be clear only electrical power output is considered. Also, 12V power outlets (e.g. cigarette lighter outputs) and USB outputs need to be excluded. The voltage limits selected are consistent with FMVSS305 definitions and limits.

Related Item

- FR-8597

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submission Date: Wed Aug 29 12:18:13 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7783-NFPA 70-2018

Statement: The word “electrical” is added to eliminate the misinterpretation of including other forms of power export.

Added voltage limits to clarify the voltage levels to be included. This was added to harmonize with SAE documents and FMVSS 305.

The info note is edited to replace the improper words “may be” with “are sometimes”, and to remove the inappropriate term “a”.

The Code has authority over such interfaces similar to Flexible Cords & Flexible Cables (Article 400), Attachment Plugs (Article 406), and Generators (Article 445).



Public Comment No. 1716-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]

Electric Vehicle Power Export Equipment (EVPE).

The equipment ~~, including the outlet on the vehicle,~~ that is used to provide power to external loads using ~~via the vehicle as the source of supply~~ electrical connection provided by the vehicle charge inlet .

Informational Note: Electric vehicle power export equipment and electric vehicle supply equipment may be contained in one piece of equipment, sometimes referred to as a bidirectional EVSE.

Statement of Problem and Substantiation for Public Comment

The scope of NFPA-70 excluded on-vehicle equipment; hence references to the AC outlet installed in vehicles should be dropped.

Related Item

- FR-8597

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 29 17:43:38 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7783-NFPA 70-2018

Statement: The word “electrical” is added to eliminate the misinterpretation of including other forms of power export.

Added voltage limits to clarify the voltage levels to be included. This was added to harmonize with SAE documents and FMVSS 305.

The info note is edited to replace the improper words “may be” with “are sometimes”, and to remove the inappropriate term “a”.

The Code has authority over such interfaces similar to Flexible Cords & Flexible Cables (Article 400), Attachment Plugs (Article 406), and Generators (Article 445).

**Public Comment No. 1476-NFPA 70-2018 [Definition: Electric Vehicle Storage Battery.]****Electric Vehicle Storage Battery.**

A battery, comprised of one or more rechargeable electrochemical cells, that has no provision for the release of excessive gas pressure during normal charging and operation, or for the addition of water or electrolyte for external measurements of electrolyte-specific gravity.

Statement of Problem and Substantiation for Public Comment

The term, Electric Vehicle Storage Battery, is not referred to in this document, and the definition of the term is not critical to distinguishing from other types of storage or batteries. It is suggested the definition of Electric Vehicle Storage Battery be removed.

Related Item

- FR-8389-NFPA 70-2018

Submitter Information Verification

Submitter Full Name: Nancy Stone

Organization: American Honda Motor

Street Address:

City:

State:

Zip:

Submittal Date: Tue Aug 28 18:57:29 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Accepted

Resolution: SR-7789-NFPA 70-2018

Statement: The term, Electric Vehicle Storage Battery, is not referred to in this document, and the definition of the term is not critical to distinguishing from other types of storage or batteries.



Public Comment No. 1477-NFPA 70-2018 [Definition: Electric Vehicle Supply Equipment (EVSE).]

Electric Vehicle Supply Equipment (EVSE).

The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric 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. ~~The EVSE can also contain electric vehicle power export equipment (EVPE) to achieve bidirectional power transfer.~~

Statement of Problem and Substantiation for Public Comment

The proposed definition of EVPE is extremely broad and is not specific. Therefore, the last sentence in the definition of EVSE could be interpreted differently from what was intended. It is suggested that the last sentence of the definition of EVSE and the whole definition of EVPE be removed.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]	
Public Comment No. 1478-NFPA 70-2018 [Section No. 625.5]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	
Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]	
Public Comment No. 1478-NFPA 70-2018 [Section No. 625.5]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	

Related Item

- FR-8397-NFPA 70-2018
- Public Input No. 2444-NFPA 70-2017 [New Definition after Definition: Electric Vehicle Storage B...]
- Public Input No. 2445-NFPA 70-2017 [Definition: Electric Vehicle Supply Equipment.]

Submitter Information Verification

Submitter Full Name: Nancy Stone
Organization: American Honda Motor
Street Address:
City:
State:
Zip:
Submission Date: Tue Aug 28 18:59:05 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7790-NFPA 70-2018](#)
Statement: The panel deleted the last sentence of EVSE because it is not necessary as part of the definition. This information was then added as an informational note.

**Public Comment No. 1548-NFPA 70-2018 [Definition: Primary Pad.]****Primary Pad.**

A device external to the EV that provides power via the contactless coupling and may include the charger power converter coupling as part of a wireless power transfer system .

Statement of Problem and Substantiation for Public Comment

This change is not directly linked to CC Note #191 and FR-8597, but it falls under the same style manual violation regarding the use of "may." By rewording it to eliminate "may" this violation can be resolved. Because the condition in the original wording that was intended to be covered by the "...may include the charger power converter" is actually handled nicely in the associated definitions of WPT and WPTE, simply referencing those definitions indirectly in the revised wording of the Primary Pad definition should suffice.

Related Item

- CC Note #191

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute (EEI)

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 11:30:59 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7791-NFPA 70-2018](#)

Statement: Panel is correcting a "use of the word may" Style Manual violation. It does not change the meaning of the defined term.

**Public Comment No. 1696-NFPA 70-2018 [Definition: Primary Pad.]****Primary Pad.**

A device external to the EV that provides electrical power to the vehicle via the contactless coupling while the vehicle is being charged and/or that accepts electrical power from the vehicle via contactless coupling while the vehicle is providing reverse power flow. The primary pad may also include the charger power converter.

Statement of Problem and Substantiation for Public Comment

Wireless power transfer can accommodate reverse power flow (RPF). The primary pad definition should be able to stand under all three cases: vehicle charging, RPF, or bi-directional.

Related Item

- FR-8420

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 29 16:33:31 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7791-NFPA 70-2018](#)
Statement: Panel is correcting a “use of the word may” Style Manual violation. It does not change the meaning of the defined term.

**Public Comment No. 1478-NFPA 70-2018 [Section No. 625.5]****625.5** Listed.

~~All electric vehicle power transfer system equipment.~~ The equipment in 625.5(A), (B), and (C) shall be listed. :

(A) EVSE

(B) WPTE

(C) Bi-directional EVSE that serves as an interactive system

Statement of Problem and Substantiation for Public Comment

“Electric vehicle power transfer system equipment” is not defined anywhere, and the term could include various power transfer devices, electrical, mechanical, electromechanical and electrochemical, and both off-board and on-board. The language in the First Draft would imply that even EV gearboxes, axles, wheels, or tires would have to be listed. This should not be the intent of this section. This section shall clearly specify the items to be listed. We should also utilize the definition of “interactive system” as defined in Article 100.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 1477-NFPA 70-2018 [Definition: Electric Vehicle Supply Equipment (EVSE).]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	
Public Comment No. 1482-NFPA 70-2018 [Section No. 625.60]	
Public Comment No. 1477-NFPA 70-2018 [Definition: Electric Vehicle Supply Equipment (EVSE).]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	
Public Comment No. 1482-NFPA 70-2018 [Section No. 625.60]	
<u>Related Item</u>	
• FR-8399-NFPA 70-2018	• Public Input No. 2445-NFPA 70-2017 [Definition: Electric Vehicle Supply Equipment.]
• FR-8576-NFPA 70-2018	• Public Input No. 2446-NFPA 70-2017 [Section No. 625.5]
	• Public Input No. 2456-NFPA 70-2017 [Section No. 625.48]

Submitter Information Verification

Submitter Full Name: Nancy Stone

Organization: American Honda Motor

Street Address:

City:

State:

Zip:

Submittal Date: Tue Aug 28 19:02:19 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7792-NFPA 70-2018](#)

Statement:

The panel clarifies that all equipment within the the scope of this article is required to be listed.

**Public Comment No. 1590-NFPA 70-2018 [Section No. 625.5]**

625.5 Listed.

All electric vehicle power transfer system equipment external to the vehicle shall be listed.

Statement of Problem and Substantiation for Public Comment

Per the scope of both NFPA-70 and Article 625, this document can only cover requirements for off-vehicle equipment.

Related Item

- FR-8399

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 29 12:35:21 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7792-NFPA 70-2018
Statement: The panel clarifies that all equipment within the the scope of this article is required to be listed.

**Public Comment No. 1097-NFPA 70-2018 [Section No. 625.42]****625.42 Rating.**

The power transfer equipment 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. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.

Adjustable settings shall only be allowed on fixed-in-place equipment. 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 with sufficient durability to withstand the environment involved on the rating label. Electric vehicle supply equipment with restricted access to an ampere adjusting means shall be permitted to have an ampere rating(s) that is equal to the adjusted current setting. Sizing the service and feeder to match the adjusting means is allowed. Restricted access shall prevent the user from gaining access to the adjusting means. Examples of restricted access are as follows:

- (1) Removable cover or door that is secured by screw(s) or bolt(s) and must be removed to access the adjusting means
- (2) Bolted equipment enclosure doors
- (3) Locked doors accessible only to qualified personnel
- (4) Password protected commissioning software accessible only to qualified personnel

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_193.pdf	70_CN 193

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 193 in the First Draft Report on First Revision No. 8556.

The Correlating Committee directs that this first revision be rewritten to comply with the NEC Style Manual. The Correlating Committee directs the panel to revise "shall only be allowed" and "is allowed" to comply with the rules in the NEC Style Manual for mandatory text.

This action will be considered as a public comment.

Related Item

- FR 8556

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 22 16:28:06 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:

Resolution: [SR-7802-NFPA 70-2018](#)

Statement: The revision clarifies the text by revising the list of examples in a way that refers to requirements rather than general information. These revisions result in a more enforceable and consistent approach.



Correlating Committee Note No. 193-NFPA 70-2018 [Section No. 625.42]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Fri May 11 11:34:40 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs that this first revision be rewritten to comply with the NEC Style Manual. The Correlating Committee directs the panel to revise "shall only be allowed" and "is allowed" to comply with the rules in the NEC Style Manual for mandatory text.

This action will be considered as a public comment.

First Revision No. 8556-NFPA 70-2018 [Section No. 625.42]

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1479-NFPA 70-2018 [Section No. 625.42]****625.42 Rating.**

The power transfer equipment 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. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.

~~Adjustable settings shall only be allowed on fixed-in-place equipment. 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 with sufficient durability to withstand the environment involved on the rating label.~~ Electric vehicle supply equipment with restricted access to an ampere adjusting means shall be permitted to have an ampere rating(s) that is equal to the adjusted current setting. Sizing the service and feeder to match the adjusting means is allowed. Restricted access shall prevent the user from gaining access to the adjusting means. Examples of restricted access are as follows:

- (1) Removable cover or door that is secured by screw(s) or bolt(s) and must be removed to access the adjusting means
- (2) Bolted equipment enclosure doors
- (3) Locked doors accessible only to qualified personnel
- (4) Password protected commissioning software accessible only to qualified personnel

Statement of Problem and Substantiation for Public Comment

There is no reason to allow adjustable settings for only certain equipment. Some portable EVSEs with adjustable settings may exist.

If adjustments have an impact on the rating, the maximum power shall be indicated on the rating label.

Related Item

- FR-8556-NFPA 70-2018 • Public Input No. 4285-NFPA 70-2017 [Section No. 625.42]

Submitter Information Verification

Submitter Full Name: Nancy Stone

Organization: American Honda Motor

Street Address:

City:

State:

Zip:

Submittal Date: Tue Aug 28 19:12:31 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The Panel agrees that equipment can be provided with an adjustable setting that controls the overall input current to the device. Equipment that is allowed to be adjusted upon installation has a bearing on the building wiring; and therefore, correlation between the adjustment setting and the supply must exist during installation. Adjustable means on portable devices was not intended.

**Public Comment No. 1665-NFPA 70-2018 [Section No. 625.42]****625.42** Rating.

The power transfer equipment 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. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.

Adjustable settings shall ~~only be allowed~~ permitted on fixed-in-place equipment only. 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 with sufficient durability to withstand the environment involved on the rating label. Electric vehicle supply equipment with restricted access to an ampere adjusting means shall be permitted to have ~~an ampere rating(s) that is~~ ampere ratings that are equal to the adjusted current setting. Sizing the service and feeder to match the adjusting means is allowed. Restricted access shall prevent the user from gaining access to the adjusting means. Examples of restricted access are as follows:

- (1) Removable cover or door that is secured by ~~screw(s) or bolt(s)~~ screws or bolts and must be removed to access the adjusting means
- (2) Bolted equipment enclosure doors
- (3) Locked doors accessible only to qualified personnel
- (4) Password protected commissioning software accessible only to qualified personnel

Statement of Problem and Substantiation for Public Comment

There are several style manual conflicts in the current and proposed wording. The recommended edits in this PC should reconcile those conflicts.

Related Item

- CC Note #193 • FR-8556

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute (EEI)

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 14:56:38 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7802-NFPA 70-2018

Statement: The revision clarifies the text by revising the list of examples in a way that refers to requirements rather than general information. These revisions result in a more enforceable and consistent approach.

**Public Comment No. 1962-NFPA 70-2018 [Section No. 625.42]****625.42 Rating.**

The power transfer equipment 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. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.

Adjustable settings shall only be allowed on fixed-in-place equipment. 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 with sufficient durability to withstand the environment involved on the rating label. Electric vehicle supply equipment with restricted access to an ampere adjusting means shall be permitted to have an ampere rating(s) that is equal to the adjusted current setting. Sizing the service and feeder to match the adjusting means is allowed. Restricted access shall prevent the user from gaining access to the adjusting means. Examples of restricted access are as follows:

- (1) Removable cover or door that is secured by screw(s) or bolt(s) and must be removed to access the adjusting means
- (2) Bolted equipment enclosure doors
- (3) Locked doors accessible only to qualified personnel
- (4) Password protected commissioning software ~~accessible~~ using a minimum 8 characters containing at least one capital letter, one numeral, and one symbol accessible only to qualified personnel

Statement of Problem and Substantiation for Public Comment

Any password used to protect settings critical to operation must be protected by a valid password. I do not consider "123456" or "password" as valid passwords in protecting these systems.

Related Item

- PI 4265-NFPA 70-2017 section 625.42

Submitter Information Verification

Submitter Full Name: Joel Goergen

Organization: Cisco Systems, Inc.

Affiliation: Cisco Systems, Inc.

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 30 13:09:23 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7802-NFPA 70-2018

Statement: The revision clarifies the text by revising the list of examples in a way that refers to requirements rather than general information. These revisions result in a more enforceable and consistent approach.

**Public Comment No. 503-NFPA 70-2018 [Section No. 625.42]****625.42 Rating.**

The power transfer equipment 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. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.

Adjustable settings shall only be allowed on fixed-in-place equipment. 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 with sufficient durability to withstand the environment involved on the rating label. Electric vehicle supply equipment with restricted access to an ampere adjusting means shall be permitted to have an ampere rating(s) that is equal to the adjusted current setting. Sizing the service and feeder to match the adjusting means is allowed. Restricted access shall prevent the user from gaining access to the adjusting means. ~~Examples of restricted access are as follows:~~

- ~~Removable cover or door that is secured by screw(s) or bolt(s) and must be removed to access the adjusting means~~
 - ~~Bolted equipment enclosure doors~~
- Restricted access shall be accomplished by at least one of the methods below:

- (1) Cover or door that requires the use of a tool to open
- (2) Locked doors accessible only to qualified personnel
- (3) Password protected commissioning software accessible only to qualified personnel

Statement of Problem and Substantiation for Public Comment

This FR limits the possible mechanical methods of access restriction that can be used to secure the restricted area while leaving open insecure methods such as thumb screws. Additionally, the FR suggests methods of access restrictions rather than specify the minimum requirements.

This suggested revision specifies that a door or cover shall be used while leaving open the method of securing the door or cover (can be removable or hinged), but specifies that a tool must be used (similar to NEC sections 600.34(F), 640.43, and 680.27(A)(1)) to allow the door or cover to be opened or removed to allow access to the restricted area.

The suggested revision makes method (2) redundant, so it has been deleted.

Related Item

• Public Input No. 4285-NFPA 70-2017 [Section No. 625.42]

• First Revision No. 8556-NFPA 70-2018 [Section No. 625.42]

Submitter Information Verification

Submitter Full Name: John Cowans

Organization: Siemens

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 09 15:26:40 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:

Resolution: [SR-7802-NFPA 70-2018](#)

Statement: The revision clarifies the text by revising the list of examples in a way that refers to requirements rather than general information. These revisions result in a more enforceable and consistent approach.

**Public Comment No. 1099-NFPA 70-2018 [Section No. 625.43]****625.43 Disconnecting Means.**

For EVSE, including bidirectional 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. The disconnecting means shall be lockable open in accordance with 110.25.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_194.pdf	70_CN 194

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 194 in the First Draft Report on First Revision No. 8569.

The Correlating Committee directs that further consideration be given to the use of commas and their impact on applicability of this requirement.

This action will be considered as a public comment.

Related Item

- FR 8569

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 22 16:29:41 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7803-NFPA 70-2018](#)
Statement: This revision clarifies and simplifies the text by removing the list of equipment and replacing with a generic reference to everything under the scope of this Article.



Correlating Committee Note No. 194-NFPA 70-2018 [Section No. 625.43]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Fri May 11 11:40:17 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs that further consideration be given to the use of commas and their impact on applicability of this requirement.

This action will be considered as a public comment.

First Revision No. 8569-NFPA 70-2018 [Section No. 625.43]

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1672-NFPA 70-2018 [Section No. 625.43]****625.43** Disconnecting Means.

For EVSE ~~, including bidirectional EVSE,~~ and WPTE ~~that are connected to the premises wiring for the purpose of charging an EV and~~ 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. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Comment

The CC implied through its Note #194 that there were problems arising from the use of commas in the proposed text. A review of the FR and Committee Statement associated with the FR revealed a more basic flaw in the applicability of the language to the types and uses of the equipment under consideration.

For EVSE and WPTE that is attached to the premises wiring and used to charge the EV, the edits proposed in this PC should correct the concerns over comma use and applicability. For EVSE that is bidirectional this will apply while it is in the mode used to charge the EV.

For bidirectional EVSE that is in the reverse power flow mode used to allow the EV to back-feed and power the premises Article 625 would no longer apply, as the EV and EVSE system has ceased to be an EV charging system and is now functioning as a generator. Language should be added to Article 445 Generators to cover this situation. Article 445 would also apply for those cases where the EV is being used as the power source through either EVSE or WPTE to power some other equipment not connected to a premises wiring system. (For example, using one EV to charge another, or to power tools out in a field somewhere where there is no other power available, etc.)

By adding language specifying a connection to the premises wiring and the intended purpose of that connection this should resolve the applicability of Article 625 based on the use of the equipment.

Related Item

- CC Note #194 • FR-8569

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute (EEI)

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 15:20:28 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The public comment refers to EV power export as belonging under generators, Article 445. This would cause confusion, especially for EVSE that are bi-directional that can charge as well as export power from the vehicle, as both Articles would apply.

**Public Comment No. 76-NFPA 70-2018 [Section No. 625.43]****625.43** Disconnecting Means.

For ~~EVSE, including bidirectional EVSE, and WPTE~~ transfer 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. The disconnecting means shall be lockable open in accordance with 110.25.

Statement of Problem and Substantiation for Public Comment

The Article's Scope now properly covers the three types of EV transfer equipment. Re-listing them in 625.43 is not only not required, but trying to include the list does introduce difficult syntax/logic problems.

Since I believe that the intent is to make the 625.43 requirement apply to any one of the three types whenever one of them is more than 60 amperes or more than 150 volts to ground - and that the new scope properly includes all three types, then I believe that the simpler 2017 language is best, with the addition of the term "transfer" as used in the new scope.

Related Item

• 8569 • 8385

Submitter Information Verification

Submitter Full Name: Scott Cline

Organization: McMurtrey Electric, Inc.

Street Address:

City:

State:

Zip:

Submission Date: Wed Jun 27 19:43:42 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7803-NFPA 70-2018](#)

Statement: This revision clarifies and simplifies the text by removing the list of equipment and replacing with a generic reference to everything under the scope of this Article.

**Public Comment No. 70-NFPA 70-2018 [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 or locking , 2-pole, 3-wire grounding-type receptacle outlet rated at 125 volts, single phase, ~~15 or 20 amperes~~ up to 60 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 or locking , 2-pole, 3-wire or 3-pole, 4-wire grounding-type receptacle outlet rated at 250 volts, single phase, ~~30 or 50~~ up to 60 amperes
- (4) A nonlocking or locking , 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 or locking , 2-pole, 3-wire grounding-type receptacle outlet rated 125 volts or 250 volts, single phase, ~~up to 50 amperes~~ 60 amperes
- (2) A nonlocking or locking , 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, three phase, ~~up to 50~~ 60 amperes
- (3) A nonlocking or locking , 3-pole, 4-wire grounding-type receptacle outlet rated 250 volts, single phase, ~~30 or 50~~ up to 60 amperes
- (4) A nonlocking or locking , 2-pole, 3-wire grounding-type receptacle outlet rated 60 volts dc maximum, 15 or 20 amperes

Statement of Problem and Substantiation for Public Comment

Add support for NEMA TT-30 and 14-60 charging for example, and simplify the section a bit. Tesla supports charging up to 48A in some of their vehicles. TT-30 is useful in RV parks. Locking outlets are also useful.

Related Item

- Public Input No. 3963-NFPA 70-2017

Submitter Information Verification

Submitter Full Name: Yuhong Bao

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Wed Jun 27 17:34:24 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The use of locking receptacles would negate the safety function of the cord being pulled from the outlet as is allowed by multiple exceptions within Article 625.



Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]

625.48 Interactive Systems.

EVSE 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, evaluated for use with the specific electric vehicles, and marked as suitable for that purpose. When used as an optional standby system, the requirements of Article 702 shall apply; when used as an electric power production source, the requirements of Article 705 shall apply. ~~EVPE that consists of a receptacle outlet only shall be in accordance with 625.60.~~

Informational Note: For further information on supply equipment, see ANSI/UL 1741, *Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources*, and ANSI/UL 9741, *Bidirectional Electric Vehicle (EV) Charging System Equipment*; for vehicle interactive systems, see SAE J3072, *Standard for Interconnection Requirements for Onboard, Utility-Interactive Inverter Systems*.

Statement of Problem and Substantiation for Public Comment

Requirements for a device to be listed should not be located in various parts of the Article. Such requirements should be noted in Section 625.5.

The discussion about EVPE and Section 625.60 are not mature. The proposed 625.60 is also outside the scope of the NEC as noted in separate comments. The sentence about EVPE and 625.60 shall be removed.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]	
Public Comment No. 1477-NFPA 70-2018 [Definition: Electric Vehicle Supply Equipment (EVSE).]	
Public Comment No. 1478-NFPA 70-2018 [Section No. 625.5]	
Public Comment No. 1482-NFPA 70-2018 [Section No. 625.60]	
Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]	
Public Comment No. 1477-NFPA 70-2018 [Definition: Electric Vehicle Supply Equipment (EVSE).]	
Public Comment No. 1478-NFPA 70-2018 [Section No. 625.5]	
Public Comment No. 1482-NFPA 70-2018 [Section No. 625.60]	

Related Item

- FR-8576-NFPA 70-2018
- Public Input No. 2456-NFPA 70-2017 [Section No. 625.48]
- FR-8534-NFPA 70-2018
- FR-8597-NFPA 70-2018
- Public Input No. 2444-NFPA 70-2017 [New Definition after Definition: Electric Vehicle Storage B...]

Submitter Information Verification

Submitter Full Name: Nancy Stone
Organization: American Honda Motor
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 28 19:19:29 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The last sentence has not been deleted because the Panel did not delete Section 625.60 and continues to support the need for requirements for the equipment required in 625.60. Section 625.5 requires that the equipment be listed, as such, there is no need to remove it here.

**Public Comment No. 1591-NFPA 70-2018 [Section No. 625.48]****625.48 Interactive Systems.**

EVSE 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, evaluated ~~for use with the specific electric vehicles~~ as compliant to the defining standards , and marked as suitable for that purpose. When used as an optional standby system, the requirements of Article 702 shall apply; when used as an electric power production source, the requirements of Article 705 shall apply. EVPE that consists of a receptacle outlet only shall be in accordance with 625.60.

Informational Note: For further information on supply equipment, see ANSI/UL 1741, *Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources*, and ANSI/UL 9741, *Bidirectional Electric Vehicle (EV) Charging System Equipment*; for vehicle interactive systems, see SAE J3072, *Standard for Interconnection Requirements for Onboard, Utility-Interactive Inverter Systems*.

Statement of Problem and Substantiation for Public Comment

It is impractical to require testing (evaluation) with all vehicles that might use the system. It would be better to require conformance to the SAE and other standards that define the interface.

Related Item

- FR-8576

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 29 12:40:47 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7806-NFPA 70-2018](#)
Statement: The revision removes the need to comply with a specific vehicle because the "evaluated" term was difficult to enforce.

**Public Comment No. 2111-NFPA 70-2018 [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 portable EVSE constructed in accordance with 625.44(A). Where the EVSE is exposed to physical damage from vehicular traffic, suitable guards shall be provided.

Statement of Problem and Substantiation for Public Comment

Particularly for outdoor installations of EVSE in public places, damage from vehicles is likely to create a hazardous condition. The suggested language is similar to that found in 110.31(D) for Electrical Equipment Accessible to Unqualified Persons. Since that section only applies to equipment over 1000 volts, nominal, adding a similar statement here would ensure protection for the EVSE that is supplied by a system of 1000 volts, nominal or less. The proposed language is narrow in scope and addresses an easily foreseen hazard.

Related Item

- PI 2865

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 18:25:36 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: Section 110.27(B) already requires protection from physical damage be provided. There is no adequate substantiation to provide specific physical protection requirements for EVSE.

**Public Comment No. 1602-NFPA 70-2018 [Section No. 625.54]****625.54** Ground-Fault Circuit-Interrupter Protection for Personnel.

~~All~~ In addition to the requirements in 210.8, 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 Comment

This Public Comment is the work of an NEC Correlating Committee task group directed to develop standardized text to improve correlation, clarity and usability of the NEC. This effort identified GFCI requirements that supplement or modify the general requirements of 210.8. The present GFCI requirements throughout the NEC were developed by various Technical Committees when the general GFCI requirements in 210.8 were limited to dwelling units. The consequences of time and various committees working to enhance safety have created significant correlation issues with the general requirements in 210.8. The arrangement of the NEC, as detailed in 90.3 clarifies that the general requirements of Chapters 1 through 4 apply "generally to all electrical installations." The work of this Task Group resulted in 41 public comments to provide necessary correlation, clarity and usability. The task group's work was identified in and based upon Correlating Committee Note 152 to the 2020 First Revisions. The Task Group members consisted of Jim Dollard, Chair, Steve Campolo, Donny Cook, Tom Domitrovich, Mark Hilbert, Keith Lofland, Alan Manche and Steve Rood.

Related Item

- CCN 152

Submitter Information Verification

Submitter Full Name: James Dollard

Organization: IBEW Local Union 98

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 13:01:53 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7809-NFPA 70-2018](#)

Statement: As Article 210 applies generally to all installations, reference back to this Article, section 210.8, is being added to reinforce and correlate the requirements.

**Public Comment No. 562-NFPA 70-2018 [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 either ground-fault circuit-interrupter protection for personnel or a disconnecting switch (such as a circuit breaker) nearby and readily accessible .

Statement of Problem and Substantiation for Public Comment

This is consistent with how RV parks work for example. This provides an alternative to expensive GFCI breakers.

Related Item

- Public Input No. 3964-NFPA 70-2017

Submitter Information Verification

Submitter Full Name: Yuhong Bao

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Sat Aug 11 03:12:32 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The concepts of GFCI and disconnect device are not addressing the same things. A disconnect device cannot be used in place of a GFCI.



Public Comment No. 1321-NFPA 70-2018 [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 (F).~~

~~(A) Type.~~

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

~~(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 integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

~~(E) On-Board Inverters.~~

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

~~(F) Marking.~~

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Statement of Problem and Substantiation for Public Comment

The requirements in this proposed section are outside the scope of NFPA-70 and because of this there is a strong likelihood automotive engineers will not reference this section for vehicle design requirements. Automotive engineers do reference SAE International documents for design guidance. SAE J1766 already gives direction on designing high voltage systems. If NFPA believes J1766 should be expanded to include new requirements, possibly similar to those in this proposed NEC section, then NFPA should work with SAE to update J1766. This section should be dropped from the NEC since it is out of the NEC scope and hence has a low probability of being utilized. If the true goal of this proposed section is to promote safety then certainly NFPA will want to place the requirements in documents with the highest probability of actually being used during the vehicle design process.

Related Item

- Drop AC outlet requirements • FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski

Organization: General Motors Company

Affiliation: SAE International

Street Address:

City:

State:

Zip:

Submission Date: Mon Aug 27 08:24:13 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: CMP 12 reaffirms its position that although these receptacles are located on the vehicle they need to be provided with regulations that allow for a suitable and safe interaction with premises wiring and equipment. It is suggested that NFPA and SAE create a joint working group to address this issue.



Public Comment No. 1482-NFPA 70-2018 [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 (F).~~

~~(A) Type.~~

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

~~(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 integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

~~(E) On-Board Inverters.~~

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

~~(F) Marking.~~

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Statement of Problem and Substantiation for Public Comment

The proposed section 625.60 is in direct conflict with Article 625.1 and 90.2 which clearly states that the scope of the NEC is limited to the equipment external to vehicles. Furthermore, the proposed definitions that include vehicle equipment is in direct conflict with NHTSA's broad authority to regulate and enforce vehicle safety which includes the Federal Motor Vehicle Safety Standards intended to reduce deaths and injuries from electrical shock. In addition, the following flaws are included in this section.

- Issues that the Code-Making Panel would like to address with this section are not clear because, depending on the category of AC receptacle, the usage conditions will be significantly different.
 - o Regarding AC reverse power flow from EV charging receptacle (namely SAE J1772 receptacle or equivalent) through an EVSE wired to the premises, the EVSE shall be listed in accordance with Section 625.5, and the EVSE shall be equipped with overcurrent protection and a ground-fault detection method. The on-board charging receptacle does not have to have overcurrent protection or a ground-fault circuit interrupter.
 - o Regarding AC reverse power flow from EV charging receptacle (namely SAE J1772 receptacle or equivalent) for powering an individual stand-alone device, such a stand-alone device is not electrically grounded, and the on-board wires conductively connected to the AC receptacle are electrically insulated. Hence, even when a ground fault occurs, a current return path that might cause electrocution would not be formed. Therefore, a ground-fault circuit interrupter is not needed.
 - o The phrase "AC receptacles intended to allow for connection of off-board utilization equipment" is not clear whether this includes NEMA 5-15R AC outlets in the cabin. AC outlets in the cabin are basically for on-board use, and not intended for devices off-board. However, some AHJ might consider on-board receptacles can be used for off-board equipment. Such ambiguity is not acceptable for an automaker selling identical products nationwide. Also, utilization equipment in the cabin is not electrically grounded, and the on-board wires conductively connected to the AC receptacle are electrically insulated. Hence, even when a ground fault occurs, a current return path that might cause electrocution would not be formed. Therefore, a ground-fault circuit interrupter is not needed.
 - o Installing a NEMA AC receptacle on the outside of the vehicle body panel is not realistic in order to conform to Federal Motor Vehicle Safety Standard. Should this section be intended to specify requirements for such a case, it would not give any benefits and would cause confusion.
- On-board overcurrent protection has various forms. For instance, a fuse box includes fuses of various circuits, and with the fuses, overcurrent of those circuits are prevented. It does not matter whether a fuse is integral with a

device or not. Also, in the case of using an on-board inverter, the inverter will be designed to suppress its output current before overcurrent flows. The requirement for overcurrent protection in the First Draft is not appropriate.

- There is not an appropriate standard for an on-board inverter that a listing organization and the auto industry have reached a consensus on. Wiring, cooling, configuration, etc. of automotive devices are very different from what the existing inverter standard intends. The current language in the First Draft requires even a low power on-board inverter to be listed, but it is not reasonable to require an on-board inverter to be listed for the reasons above.

- Ensuring visibility of the rating during the use of the receptacle is not a conventional way for an automobile application. Conforming to the requirement would require extra space and make the vehicle packaging complicated.

On the whole, this section is not clear about technical issues to be addressed, and the requirements herein are not reasonable. Unreasonable requirements would just increase size, weight and costs without any safety benefits, and thus, it would make the advanced electric vehicle technology prohibitive in the United States due to complexity in packaging and in achieving crash integrity. Such a negative situation would sustain for more than a decade due to long-term legal implication of National Electrical Code. Therefore, it is suggested that this section be deleted.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	
Public Comment No. 1478-NFPA 70-2018 [Section No. 625.5]	
Public Comment No. 1475-NFPA 70-2018 [Definition: Electric Vehicle Power Export Equipment (EVPE).]	
Public Comment No. 1478-NFPA 70-2018 [Section No. 625.5]	
Public Comment No. 1480-NFPA 70-2018 [Section No. 625.48]	

Related Item

• FR-8211-NFPA 70-2018	• FR-8385-NFPA 70-2018	• FR-8534-NFPA 70-2018	• Public Input No. 2449-NFPA 70-2017 [New Section after 625.40]
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Submitter Information Verification

Submitter Full Name: Nancy Stone

Organization: American Honda Motor

Street Address:

City:

State:

Zip:

Submission Date: Tue Aug 28 19:26:34 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: CMP 12 reaffirms its position that although these receptacles are located on the vehicle they need to be provided with regulations that allow for a suitable and safe interaction with premises wiring and equipment. It is suggested that NFPA and SAE create a joint working group to address this issue.

**Public Comment No. 1596-NFPA 70-2018 [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 (F).~~

~~(A) Type.~~

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

~~(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 integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

~~(E) On-Board Inverters.~~

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

~~(F) Marking.~~

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA_70- NEC2020_FR8534_Ford_Comments_2018Aug30.pdf	Ford Comments on NFPA 70- NEC2020	

Statement of Problem and Substantiation for Public Comment

On-vehicle requirements should be consistent with existing roles within the industry standards development by having separate infrastructure requirements addressed by NFPA codes and on-vehicle requirements addressed through the SAE International standards process. SAE standards are the recognized source for automobile standards and often referenced/adopted in federal regulations. Therefore, Ford recommends that any references to establish standards on automotive vehicles be removed from the proposed Code updates.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: Rebecca Shelby

Organization: Ford Motor Company

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 12:49:14 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: CMP 12 reaffirms its position that although these receptacles are located on the vehicle they need to be provided with regulations that allow for a suitable and safe interaction with premises wiring and equipment. It is suggested that NFPA and SAE create a joint working group to address this issue.



Bob Holycross
Sustainability & Vehicle Environmental Matters
Sustainability, Environment & Safety Engineering
Ford Motor Company

Ford World Headquarters
One American Road
Dearborn, MI 48126-2738 USA

August 30, 2018

Mr. Christian Dubay,
Vice President,
Codes & Standards and Chief Engineer
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Subject: Proposed updates to U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534

Dear Mr. Dubay:

Thank you for giving Ford Motor Company (Ford) the opportunity to provide comments on the proposed changes to the National Fire Protection Association (NFPA) U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534 (the Code). Ford appreciates your consideration of these comments for the next draft review.

Safety continues to be one of the highest priorities in the design of Ford vehicles. Ford's corporate safety policy outlines our commitment to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions. This helps us meet or exceed both applicable laws and regulations, and the needs and expectations of our customers in a variety of situations.

Ford appreciates the NFPA's goal to proactively update the Code for well-defined and consistent standards. However, any on-vehicle requirements should be consistent with existing roles within industry standards development by having separate infrastructure requirements addressed by NFPA codes and on-vehicle requirements addressed through the SAE International standards process. SAE standards are the recognized source for automobile standards and often referenced/adopted in federal regulations and standards. Therefore, Ford recommends that any references to establish standards on automotive vehicles be removed from the proposed Code updates.

While the NFPA Code is not a state regulation, these regulations serve as a model for state legislation. Individual state adoption of different versions of the Code could raise issues of unique, individual state-by-state requirements for motor vehicles, resulting in requiring different vehicles for different states and hamper correction of any in-field vehicle issues. In addition, the ability for states to enforce on-vehicle Code requirements will be a complex and almost impossible task with many components being installed within other larger systems and/or hidden from view.

SAE International also develops motor vehicle standards that may influence and/or form the basis for Federal Motor Vehicle Safety Standards (FMVSS). For example, in September 2017, NHTSA published a Final Rule amending FMVSS 305 *Electric-Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection*. See Final Rule, 82 Fed. Reg. 44946 (Sept. 27, 2017). This Final Rule includes in-use requirements and revised crash requirements, which was based on SAE J1766, "Recommended practice for electric, fuel cell, and hybrid electric vehicle crash integrity testing," January 2014. Therefore, Ford

would urge NFPA to work with SAE International when assessing the need for potential additional requirements for both on- and off-vehicle safety.

Moreover, the Scope of the Code specifically does not allow for regulations of automotive vehicles, by stating in Article 90.2 (B):

Not Covered. This Code does not cover the following

(1) Installations in...automotive vehicles other than mobile homes and recreational vehicles.

Ford also wanted to provide the NFPA with some specific technical comments regarding FR#8534, Article 625. While the spirit of the proposed requirements may be well intentioned for the automobile specific 120V outlets, the proposed requirements from a technical perspective add complexity without increasing safety.

625.60 (C). Requiring overcurrent protection be integrated into to the receptacle would increase complexity when other more effective, reliable approaches are possible through centralization with no compromise to safety.

625.60 (D). Regarding the requirement for a GFCI in each receptacle, the desired function can be achieved without having a GFCI integral to each receptacle. This would again increase complexity with no additional safety benefit. The availability of an automotive grade GFCI capable of operating in various non-stationary conditions should also be considered.

625.60 (E). Existing or agreed upon procedures for listing inverters does not currently exist for automobile components. The necessary requirements for vibration and other unique use cases would be different than those normally encountered by listing agencies. The decentralization of the inverter in addition to the necessary associated components to evaluate the inverter would make separate bench testing difficult to impossible. Finally, a listing requirement could hamper the implementation of necessary vehicle field fixes.

625.60 (F). Having a visual marking requirement stricter than other similar use cases such as home receptacles is not necessary or beneficial to the customer.

Finally, Ford supports the efforts by NFPA to allow for bi-directional power as this will be a critical future technology. However, on-vehicle safety standards development fall under the role of SAE International as the recognized source of automobile specifications. In order to develop standards that align with existing, industry-wide automotive standards, Ford recommends that all references to on-vehicle standards be removed from the proposed Code standards.

Thank you for considering these comments. If you have any questions, please feel free to contact Rebecca Shelby at rking25@ford.com, or at (313) 248-8010.

Sincerely,



(for Bob Holycross)

Bob Holycross
Director, Sustainability & Vehicle Environmental Matters
Ford Motor Company

cc:

Dawn Bellis
Mary Maynard
Linda Fuller



Public Comment No. 2059-NFPA 70-2018 [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 (F).~~

~~(A) Type.~~

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

~~(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 integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

~~(E) On-Board Inverters.~~

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

~~(F) Marking.~~

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Attached are the comments of the Alliance of Automobile Manufacturers, the Association of Global Automakers and SAE

International, regarding the proposed revisions in National Electrical Code (NEC) Article 625.

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
Joint_Alliance_Global_SAE_Comments_to_NFPA_70_Aug_30_2018_FINAL_.pdf	Joint Comments - Alliance of Automobile Manufacturers, the Association of Global Automakers and SAE International	

Statement of Problem and Substantiation for Public Comment

Please see attached letter.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: Paul Scullion

Organization: Global Automakers
Affiliation: Alliance of Automobile Manufacturers, the Association of Global Automakers and SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 30 15:51:24 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected
Resolution: CMP 12 reaffirms its position that although these receptacles are located on the vehicle they need to be provided with regulations that allow for a suitable and safe interaction with premises wiring and equipment. It is suggested that NFPA and SAE create a joint working group to address this issue.



AUTO ALLIANCE
DRIVING INNOVATION®

GlobalAutomakers 



August 30, 2018

Mr. Christian Dubay,
Vice President,
Codes & Standards and Chief Engineer
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Re: NFPA 70 – NEC 2020 Proposed Revisions in Article 625 (Electric Vehicle Power Transfer System)

Dear Mr. Dubay,

On behalf of the Alliance of Automobile Manufacturers¹, the Association of Global Automakers² and SAE International, we write to express our concerns regarding the proposed revisions in National Electrical Code (NEC) Article 625. Specifically, we are concerned with the proposed inclusion of requirements for automobile specific AC receptacle outlets in the first Draft Report for Article 625. Instead we propose the formation of a joint NFPA/SAE activity to address the harmonization of requirements for on-vehicle and off-vehicle electric power transfer equipment.

We recognize that on-vehicle 120V outlets have been providing convenience to users, and that reverse power flow (RPF) via the SAE J1772 coupler is a technology that is likely to become increasingly important to the automotive industry in the future. We also appreciate NFPA's goal to develop well-defined, consistent and mature standards that support advancement of RPF-related technology. However, some proposed definitions

¹ Alliance of Automobile Manufacturers, whose members include BMW Group, FCA US LLC, Ford Motor Company, General Motors Company, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche Cars North America, Toyota, Volkswagen Group of America, and Volvo Cars of North America.

² Association of Global Automakers, whose members include American Honda Motor Co., Inc., Aston Martin Lagonda of North America, Inc., BYTON, Ferrari North America, Inc., Hyundai Motor America, Isuzu Motors America, Inc., Kia Motors America, Inc., Maserati North America, Inc., McLaren Automotive Ltd., Nissan North America, Inc., Subaru of America, Inc., Suzuki Motor of America, Inc., and Toyota Motor North America

and requirements in the 2020 Proposed Revisions have not been appropriately specified and require further discussion.

As trade associations representing OEM vehicle manufacturers, and a US automotive standards body, we support providing electrical safety to customers of plug-in electric vehicles (PEVs). This goal must be accomplished in a coordinated manner between the on-vehicle and off-vehicle requirements. Any on-vehicle requirements should reflect the traditional separation of industry standards development roles such that infrastructure requirements are addressed by NFPA codes and on-vehicle requirements are addressed through the SAE standards process. SAE standards are the recognized source for automobile standards and are often referenced or adopted in federal regulations and standards. **By maintaining this separation, we avoid the potential duplication and incompatibility of potentially conflicting standards/requirements while providing the appropriate industry standards necessary to ensure public safety and properly designed products.**

Proposed Requirements are Inconsistent with the Stated Scope of NFPA 70

Section 90.2(B)(1) expressly indicates that “automotive vehicles” are “Not Covered.” This is further reinforced in the scope of article 625 that also states that: *“This article covers the electrical conductors and equipment external (emphasis added) to an electric vehicle for the purposes of charging, power export, and bidirectional current flow.”*

Since the NFPA-70 scope is clear on its exclusion of automotive vehicles, it is likely that many manufacturers/suppliers of the subject on-vehicle equipment, especially those that are not intimately involved in the NFPA revision process, may not even recognize that there are requirements intended for their products contained in the document. If the goal of this proposed section is to promote safety, then NFPA should work with SAE to place the specifications in standards with the highest probability of reference and use during the vehicle design process. In the United States, SAE International is the recognized organization for the establishment of industry standards for on-vehicle equipment.

There is No Demonstrated Safety Need or Urgency – The National Highway Traffic Safety Administration (NHTSA) Defects Program Provides a Safety Net

The subject AC outlets specified in the proposed section 625.60 are not unique to electric vehicles and have been fitted on some ICE vehicles for some time. We are not aware of any safety issues associated with the NEMA outlets fitted to vehicles.

In addition, NHTSA has authority to require manufacturers to conform to safety requirements in the Federal Motor Vehicle Safety Standards (FMVSS); the agency also has general recall authority. As a result, if any safety-related concerns with the AC outlets provided on motor vehicles are identified, manufacturers have an obligation to recall and remedy the equipment.

Given the fact that there are no current issues and NHTSA Defect authority provides a mechanism to address and resolve potential issues, there is no need or immediate urgency for the development of industry standards covering these receptacles as part of this revision. As a result, there is time for the development of a joint NFPA/SAE effort to develop appropriate standards for these AC outlets.

EV/HEV Electrical Safety (SAE J1766)

In the United States, SAE International is responsible for industry standards covering on-vehicle equipment. SAE currently has a standard (J1766) that provides specifications for high voltage safety for electric, fuel cell, and hybrid electric vehicles. It details safety strategies that OEMs shall employ for ensuring on-vehicle high voltage electrical safety, including the post-crash conditions. This standard is adopted within FMVSS 305, and thus, OEMs are required to comply with it. In addition, J2344 also provides technical guidance for vehicles that contain high voltage during normal operation

OEMs recognize and employ SAE technical standards to guide vehicle design. By having consistent and harmonized on-vehicle and off-vehicle standards, the overall goal of NFPA 70 -- *"safeguarding of persons and property from hazards arising from the use of electricity"* -- will be realized.

The specific requirements in the 2020 Proposed Revisions of NFPA 70 would not resolve any hazardous conditions addressed in SAE J1766, as well as in related OEM design processes; in some circumstances, the 2020 Proposed Requirements could hamper the correction of vehicle field issues. For example, the J1766 document is designed around a provision of high isolation between the high voltage rails and chassis ground; this specification prevents excessive current flow if a human were to bridge one rail to chassis ground. This isolation resistance should provide 2.0 mA or less of fault current. The NFPA GFCI methodology is based around detection and shutdown of current flow after a fault has occurred. Article 100 of the 2017 version of NFPA-70 states that Class-A GFCI shall not trip when the fault current is less than 4.0 mA, which is not harmonized with SAE J1766.

State Inspectors Are Not Equipped to Enforce On-Vehicle Equipment Compliance

Although NFPA 70 is a voluntary industry standard, it becomes regulatory by virtue of it being referenced in state and local electrical codes. In addition, if on-vehicle requirements are placed in the NEC, these requirements will likely change in future versions of the Code. Different states and locations are allowed to adopt different versions of the Code. This could result in situations where a particular vehicle model would not fulfill the NEC requirements in adjacent States. Similarly, if code revisions are applied retroactively, a vehicle that previously fulfilled the code requirements may suddenly be non-compliant. In addition, varying code requirements would also pose difficulty as vehicles are resold and registered in other States. These situations are not consistent with sales and distribution methods of OEM's or consumers' typical understanding of vehicle

registration or licensing, and will place tremendous logistical burdens on manufacturers, dealers, and consumers with no commensurate safety benefit.

The proposal also fails to recognize that states and local authorities having jurisdiction (AHJs) have no mechanisms in place to enforce the on-vehicle requirements since site inspections do not require a vehicle to be present nor are there vehicle-specific inspection provisions/facilities.

The Article 625 proposal requires the AC output device – as well as all electric power transfer system equipment – to be listed. Currently there are no known listing procedures that ensure automotive-grade integrity under the unique automotive environment. Additionally, the required equipment to be listed is far too broadly defined to be able to establish reasonable or effective listing procedures.

OEMs frequently distribute functionality among multiple different physical devices on the vehicle. If this were the case for a DC-to-AC inverter, it would be very difficult, if not impossible, for the listing agency to perform the required off-vehicle testing of the inverter section of a larger electrical device. These components are typically located where it is not easy to inspect them by the AHJ in the field without extensive vehicle disassembly. In most cases, an AHJ would not have the training, tools, skills or experience to safely verify this requirement in the field.

Desired Overcurrent Protection Can Be Provided More Efficiently than Section 625 Specifies

The requirement for the integration of a GFCI in each receptacle is not the most efficient solution for the automotive application, since the desired function can be achieved through integration/centralization without having a GFCI integral to each receptacle. Such a requirement would only increase complexity and potentially decrease reliability when other more effective approaches are possible through centralization of such functions with no compromise to safety.

Furthermore, having a visual marking requirement stricter than other similar use cases such as home receptacles is not necessary or beneficial to the customer.

Recommended Approach

Given the fact that we are not aware of any field issues identified with the safety of 120V AC outlets currently being fitted to vehicles (which are covered under NHTSA's defect authority in any event), and that automotive applications are clearly outside the scope of NFPA 70, we recommend that NFPA complete its update of standard 70 without the inclusion of on-vehicle requirements (including, but not limited to, section 625.60).

In order to address the concern about on-vehicle 120V AC power outlets, we propose the creation of a joint NFPA/SAE effort, involving NHTSA as a stakeholder, to consider updating SAE J1766. Furthermore, it might be beneficial to add notes in the NFPA and SAE standards pointing to each other so that users of these standards

can understand how the two standards appropriately cover both the off-vehicle and on-vehicle components relative to EVs and EV charging.

We appreciate your consideration of this request and would be happy to discuss this further with you. Please contact us if you have any questions or need additional information.

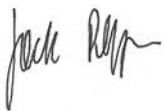
Sincerely,

A handwritten signature in black ink, appearing to read "Scott Schmidt", with a stylized, flowing script.

Scott Schmidt
Senior Director,
Alliance of Automobile Manufacturers, Inc.
(202) 326-5545

A handwritten signature in black ink, appearing to read "Stephen Gehring", with a stylized, flowing script.

Stephen Gehring,
Vice President,
Association of Global Automakers

A handwritten signature in black ink, appearing to read "Jack Pokrzywa", with a stylized, flowing script.

Jack Pokrzywa
Director,
SAE International
US TAG ISO TC22 Chairperson

cc:

D. Bellis

M. Maynard

L. Fuller

**Public Comment No. 317-NFPA 70-2018 [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 (F).~~

~~(A) Type.~~

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

~~(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 integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

~~(E) On-Board Inverters.~~

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

~~(F) Marking.~~

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Statement of Problem and Substantiation for Public Comment

Delete this section in its entirety. This section is out of scope of the NEC per 90.2 (B)

Related Item

- FR 8534

Submitter Information Verification

Submitter Full Name: Timothy Croushore

Organization: FirstEnergy

Affiliation: FirstEnergy

Street Address:

City:

State:

Zip:

Submission Date: Fri Jul 27 13:45:48 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: CMP 12 reaffirms its position that although these receptacles are located on the vehicle they need to be provided with regulations that allow for a suitable and safe interaction with premises wiring and equipment. It is suggested that NFPA and SAE create a joint working group to address this issue.



Public Comment No. 587-NFPA 70-2018 [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 (F).~~

~~(A) Type.~~

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

~~(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 integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

~~(E) On-Board Inverters.~~

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

~~(F) Marking.~~

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Statement of Problem and Substantiation for Public Comment

Article 90.2(B)(1) specifically excludes from the NEC scope of coverage the wiring systems of automotive vehicles other than mobile homes and recreational vehicles. The outlets this proposed FR intends to regulate are clearly a part of the internal wiring of excluded vehicles. Allowing the proposed Section 625.60 to become part of the NEC would place Article 625 in direct conflict with Article 90, which would create confusion and undermine the ability of AHJs to effectively enforce the code.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 13 11:18:05 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Rejected

Action:

Resolution: CMP 12 reaffirms its position that although these receptacles are located on the vehicle they need to be provided with regulations that allow for a suitable and safe interaction with premises wiring and equipment. It is suggested that NFPA and SAE create a joint working group to address this issue.

**Public Comment No. 1326-NFPA 70-2018 [Section No. 625.60(A)]**

(A) Type.

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

Statement of Problem and Substantiation for Public Comment

This new requirement is that on-vehicle receptacles be listed, presumably using the same test procedure defined for off-vehicle outlets. However, the environmental conditions are very different between buildings and vehicles primarily around vibration profiles. The use of a listed receptacle that has not been appropriately tested for withstanding extreme vibrations and mechanical shocks may in fact result in increased electrical shock hazards due to premature failures. This proposed requirement should be dropped.

Related Item

- Listing does not work for on-vehicle because of environmental differences • FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 27 08:59:22 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7796-NFPA 70-2018](#)
Statement: The requirement was revised to allow the use of any listed receptacle types. There is no rationale why the listing of a receptacle is not required for use in a vehicle.

**Public Comment No. 1327-NFPA 70-2018 [Section No. 625.60(A)]**

(A) Type.

~~The receptacle outlet shall be a listed grounding-type receptacle.~~

Statement of Problem and Substantiation for Public Comment

Grounding-type receptacles does not seem to be a defined term in NFPA-70, but presumably it means an outlet that provides a ground connection. The requirement for a grounded outlet is not suitable for vehicles. NFPA-70 defines grounded as "connected to ground or to a conductive body that extend the ground connection." NFPA-70 further defines ground as "the earth." The earth is not electrically accessible by a motor vehicle during normal usage. This proposed requirement should be dropped.

Related Item

- Grounded outlet can not be realized on a vehicle. • FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 27 09:03:12 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7796-NFPA 70-2018](#)
Statement: The requirement was revised to allow the use of any listed receptacle types. There is no rationale why the listing of a receptacle is not required for use in a vehicle.

**Public Comment No. 74-NFPA 70-2018 [Section No. 625.60(B)]**

(B) Rating.

The receptacle outlet shall be rated 250 volts maximum, single phase 50- 60 amperes maximum.

Statement of Problem and Substantiation for Public Comment

Add support for 60A outlets,

Related Item

- Public Input No. 2449-NFPA 70-2017

Submitter Information Verification

Submitter Full Name: Yuhong Bao

Organization: [Not Specified]

Street Address:

City:

State:

Zip:

Submittal Date: Wed Jun 27 19:33:29 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: Article 625 has already established 50 A maximum rating for receptacles when cord connecting EVSE, so this value was utilized here. There is no substantiation as to why this receptacle needs to be rated 60 A.



Public Comment No. 1322-NFPA 70-2018 [Section No. 625.60(C)]

(C) Overcurrent Protection.

Electric vehicles provided with receptacle outlets for power export shall be provided ~~with integral overcurrent protection~~ 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48.

Statement of Problem and Substantiation for Public Comment

This requirement is unclear as to where the overcurrent protection needs to be provided – integral to the receptacle or to the power export system. AC outlets on PEVs are generally driven by a DC to AC inverter. These controllers are designed to provide limited power and are generally fused on the input side to prevent overcurrent. Hence, there is inherent overcurrent protection in the system but not integral to the receptacles. Forcing additional protection on the receptacles would add unreliability and cost to the overall system.

Related Item

- Overcurrent requirement is unclear • FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submission Date: Mon Aug 27 08:33:57 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7798-NFPA 70-2018
Statement: The intent of the requirement is to require overcurrent protection be provided to protect the receptacle and offboard utilization equipment connected to the receptacle. The protection can be located other than integral to the receptacle and still accomplish the function. Short-circuit has been changed to fault in order to be consistent with the remainder of the document.

**Public Comment No. 2030-NFPA 70-2018 [Section No. 625.60(C)]****(C) Overcurrent Protection.**

~~Electric vehicles provided with receptacle outlets for power export shall be provided with integral overcurrent protection. 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 short-circuit current at the receptacle and shall be included in the interactive equipment evaluation. See 625.48 .~~

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA_70- NEC2020_FR8534_Ford_Comments_2018Aug30.pdf	Ford comments on NFPA 70- NEC2020	

Statement of Problem and Substantiation for Public Comment

Requiring overcurrent protection be integrated into to the receptacle would increase complexity when other more effective, reliable approaches are possible through centralization with no compromise to safety.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: Rebecca Shelby
Organization: Ford Motor Company
Street Address:
City:
State:
Zip:
Submission Date: Thu Aug 30 15:17:33 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7798-NFPA 70-2018
Statement: The intent of the requirement is to require overcurrent protection be provided to protect the receptacle and offboard utilization equipment connected to the receptacle. The protection can be located other than integral to the receptacle and still accomplish the function. Short-circuit has been changed to fault in order to be consistent with the remainder of the document.



Bob Holycross
Sustainability & Vehicle Environmental Matters
Sustainability, Environment & Safety Engineering
Ford Motor Company

Ford World Headquarters
One American Road
Dearborn, MI 48126-2738 USA

August 30, 2018

Mr. Christian Dubay,
Vice President,
Codes & Standards and Chief Engineer
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Subject: Proposed updates to U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534

Dear Mr. Dubay:

Thank you for giving Ford Motor Company (Ford) the opportunity to provide comments on the proposed changes to the National Fire Protection Association (NFPA) U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534 (the Code). Ford appreciates your consideration of these comments for the next draft review.

Safety continues to be one of the highest priorities in the design of Ford vehicles. Ford's corporate safety policy outlines our commitment to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions. This helps us meet or exceed both applicable laws and regulations, and the needs and expectations of our customers in a variety of situations.

Ford appreciates the NFPA's goal to proactively update the Code for well-defined and consistent standards. However, any on-vehicle requirements should be consistent with existing roles within industry standards development by having separate infrastructure requirements addressed by NFPA codes and on-vehicle requirements addressed through the SAE International standards process. SAE standards are the recognized source for automobile standards and often referenced/adopted in federal regulations and standards. Therefore, Ford recommends that any references to establish standards on automotive vehicles be removed from the proposed Code updates.

While the NFPA Code is not a state regulation, these regulations serve as a model for state legislation. Individual state adoption of different versions of the Code could raise issues of unique, individual state-by-state requirements for motor vehicles, resulting in requiring different vehicles for different states and hamper correction of any in-field vehicle issues. In addition, the ability for states to enforce on-vehicle Code requirements will be a complex and almost impossible task with many components being installed within other larger systems and/or hidden from view.

SAE International also develops motor vehicle standards that may influence and/or form the basis for Federal Motor Vehicle Safety Standards (FMVSS). For example, in September 2017, NHTSA published a Final Rule amending FMVSS 305 *Electric-Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection*. See Final Rule, 82 Fed. Reg. 44946 (Sept. 27, 2017). This Final Rule includes in-use requirements and revised crash requirements, which was based on SAE J1766, "Recommended practice for electric, fuel cell, and hybrid electric vehicle crash integrity testing," January 2014. Therefore, Ford

would urge NFPA to work with SAE International when assessing the need for potential additional requirements for both on- and off-vehicle safety.

Moreover, the Scope of the Code specifically does not allow for regulations of automotive vehicles, by stating in Article 90.2 (B):

Not Covered. This Code does not cover the following

(1) Installations in...automotive vehicles other than mobile homes and recreational vehicles.

Ford also wanted to provide the NFPA with some specific technical comments regarding FR#8534, Article 625. While the spirit of the proposed requirements may be well intentioned for the automobile specific 120V outlets, the proposed requirements from a technical perspective add complexity without increasing safety.

625.60 (C). Requiring overcurrent protection be integrated into to the receptacle would increase complexity when other more effective, reliable approaches are possible through centralization with no compromise to safety.

625.60 (D). Regarding the requirement for a GFCI in each receptacle, the desired function can be achieved without having a GFCI integral to each receptacle. This would again increase complexity with no additional safety benefit. The availability of an automotive grade GFCI capable of operating in various non-stationary conditions should also be considered.

625.60 (E). Existing or agreed upon procedures for listing inverters does not currently exist for automobile components. The necessary requirements for vibration and other unique use cases would be different than those normally encountered by listing agencies. The decentralization of the inverter in addition to the necessary associated components to evaluate the inverter would make separate bench testing difficult to impossible. Finally, a listing requirement could hamper the implementation of necessary vehicle field fixes.

625.60 (F). Having a visual marking requirement stricter than other similar use cases such as home receptacles is not necessary or beneficial to the customer.

Finally, Ford supports the efforts by NFPA to allow for bi-directional power as this will be a critical future technology. However, on-vehicle safety standards development fall under the role of SAE International as the recognized source of automobile specifications. In order to develop standards that align with existing, industry-wide automotive standards, Ford recommends that all references to on-vehicle standards be removed from the proposed Code standards.

Thank you for considering these comments. If you have any questions, please feel free to contact Rebecca Shelby at rking25@ford.com, or at (313) 248-8010.

Sincerely,



(for Bob Holycross)

Bob Holycross
Director, Sustainability & Vehicle Environmental Matters
Ford Motor Company

cc:

Dawn Bellis
Mary Maynard
Linda Fuller

**Public Comment No. 1328-NFPA 70-2018 [Section No. 625.60(D)]**

(D) GFCI Protection for Personnel.

~~All receptacle outlets shall have ground-fault circuit-interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

Statement of Problem and Substantiation for Public Comment

The NFPA-70 definition of a GFCI requires that the device de-energize when the “current to ground exceeds the values established...” NFPA-70 defines ground as “the earth.” The earth is not electrically accessible by a motor vehicle during normal usage, and hence by the NFPA-70 definitions a GFCI in this usage would never de-energize -- adding this requirement would provide no protection against electrical shock hazards. This proposed requirement should be dropped.

Related Item

- GFCI as defined will not provide protection • FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski

Organization: General Motors Company

Affiliation: SAE International

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 27 09:05:49 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The use of GFCI protection is looking for an imbalance in the current out against the current in. If this balance is not met, then the system shuts down. The GFCI function is required to be included, but is not indicated as to how this is to be provided. The vehicle manufacturer has the ability to decide how this is accomplished.

**Public Comment No. 1704-NFPA 70-2018 [Section No. 625.60(D)]**

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit-interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

Statement of Problem and Substantiation for Public Comment

Vehicle manufactures are required to comply with all Federal Motor Vehicle Safety Standards (FMVSS). My understanding is that FMVS305 has a 2mA maximum leakage requirement for AC circuits whereas NFPA-70 states: "Class A ground-fault circuit interrupters trip when the current to ground is 6 mA or higher and do not trip when the current to ground is less than 4 mA." Therefore, it may be impossible to comply with NFPA's GFCI requirements simultaneously with FMVSS305 compliance. Since there is no known public input requesting a change in the definition of a GFCI, this requirements should be dropped.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski

Organization: General Motors Company

Affiliation: SAE International

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 17:12:17 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The use of GFCI protection is looking for an imbalance in the current out against the current in. If this balance is not met, then the system shuts down. The GFCI function is required to be included, but is not indicated as to how this is to be provided. The vehicle manufacturer has the ability to decide how this is accomplished.

**Public Comment No. 2034-NFPA 70-2018 [Section No. 625.60(D)]**

~~(D) GFCI Protection for Personnel.~~

~~All receptacle outlets shall have ground-fault circuit-interrupter protection for personnel, integral to the receptacle, or have a readily accessible means for indication and reset.~~

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA_70- NEC2020_FR8534_Ford_Comments_2018Aug30.pdf	Ford Comments on NFPA 70-NEC 2020	

Statement of Problem and Substantiation for Public Comment

Regarding the requirement for a GFCI in each receptacle, the desired function can be achieved without having a GFCI integral to each receptacle. This would again increase complexity with no additional safety benefit. The availability of an automotive grade GFCI capable of operating in various non-stationary conditions should also be considered.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: Rebecca Shelby
Organization: Ford Motor Company
Street Address:
City:
State:
Zip:
Submission Date: Thu Aug 30 15:21:02 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected
Resolution: The use of GFCI protection is looking for an imbalance in the current out against the current in. If this balance is not met, then the system shuts down. The GFCI function is required to be included, but is not indicated as to how this is to be provided. The vehicle manufacturer has the ability to decide how this is accomplished.



Bob Holycross
Sustainability & Vehicle Environmental Matters
Sustainability, Environment & Safety Engineering
Ford Motor Company

Ford World Headquarters
One American Road
Dearborn, MI 48126-2738 USA

August 30, 2018

Mr. Christian Dubay,
Vice President,
Codes & Standards and Chief Engineer
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Subject: Proposed updates to U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534

Dear Mr. Dubay:

Thank you for giving Ford Motor Company (Ford) the opportunity to provide comments on the proposed changes to the National Fire Protection Association (NFPA) U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534 (the Code). Ford appreciates your consideration of these comments for the next draft review.

Safety continues to be one of the highest priorities in the design of Ford vehicles. Ford's corporate safety policy outlines our commitment to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions. This helps us meet or exceed both applicable laws and regulations, and the needs and expectations of our customers in a variety of situations.

Ford appreciates the NFPA's goal to proactively update the Code for well-defined and consistent standards. However, any on-vehicle requirements should be consistent with existing roles within industry standards development by having separate infrastructure requirements addressed by NFPA codes and on-vehicle requirements addressed through the SAE International standards process. SAE standards are the recognized source for automobile standards and often referenced/adopted in federal regulations and standards. Therefore, Ford recommends that any references to establish standards on automotive vehicles be removed from the proposed Code updates.

While the NFPA Code is not a state regulation, these regulations serve as a model for state legislation. Individual state adoption of different versions of the Code could raise issues of unique, individual state-by-state requirements for motor vehicles, resulting in requiring different vehicles for different states and hamper correction of any in-field vehicle issues. In addition, the ability for states to enforce on-vehicle Code requirements will be a complex and almost impossible task with many components being installed within other larger systems and/or hidden from view.

SAE International also develops motor vehicle standards that may influence and/or form the basis for Federal Motor Vehicle Safety Standards (FMVSS). For example, in September 2017, NHTSA published a Final Rule amending FMVSS 305 *Electric-Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection*. See Final Rule, 82 Fed. Reg. 44946 (Sept. 27, 2017). This Final Rule includes in-use requirements and revised crash requirements, which was based on SAE J1766, "Recommended practice for electric, fuel cell, and hybrid electric vehicle crash integrity testing," January 2014. Therefore, Ford

would urge NFPA to work with SAE International when assessing the need for potential additional requirements for both on- and off-vehicle safety.

Moreover, the Scope of the Code specifically does not allow for regulations of automotive vehicles, by stating in Article 90.2 (B):

Not Covered. This Code does not cover the following

(1) Installations in...automotive vehicles other than mobile homes and recreational vehicles.

Ford also wanted to provide the NFPA with some specific technical comments regarding FR#8534, Article 625. While the spirit of the proposed requirements may be well intentioned for the automobile specific 120V outlets, the proposed requirements from a technical perspective add complexity without increasing safety.

625.60 (C). Requiring overcurrent protection be integrated into to the receptacle would increase complexity when other more effective, reliable approaches are possible through centralization with no compromise to safety.

625.60 (D). Regarding the requirement for a GFCI in each receptacle, the desired function can be achieved without having a GFCI integral to each receptacle. This would again increase complexity with no additional safety benefit. The availability of an automotive grade GFCI capable of operating in various non-stationary conditions should also be considered.

625.60 (E). Existing or agreed upon procedures for listing inverters does not currently exist for automobile components. The necessary requirements for vibration and other unique use cases would be different than those normally encountered by listing agencies. The decentralization of the inverter in addition to the necessary associated components to evaluate the inverter would make separate bench testing difficult to impossible. Finally, a listing requirement could hamper the implementation of necessary vehicle field fixes.

625.60 (F). Having a visual marking requirement stricter than other similar use cases such as home receptacles is not necessary or beneficial to the customer.

Finally, Ford supports the efforts by NFPA to allow for bi-directional power as this will be a critical future technology. However, on-vehicle safety standards development fall under the role of SAE International as the recognized source of automobile specifications. In order to develop standards that align with existing, industry-wide automotive standards, Ford recommends that all references to on-vehicle standards be removed from the proposed Code standards.

Thank you for considering these comments. If you have any questions, please feel free to contact Rebecca Shelby at rking25@ford.com, or at (313) 248-8010.

Sincerely,



(for Bob Holycross)

Bob Holycross
Director, Sustainability & Vehicle Environmental Matters
Ford Motor Company

cc:

Dawn Bellis
Mary Maynard
Linda Fuller

**Public Comment No. 243-NFPA 70-2018 [Section No. 625.60(D)]**

(D) GFCI Protection for Personnel.

~~All receptacle outlets shall have ground~~

~~Ground -fault circuit-interrupter protection for personnel~~

~~, integral to the receptacle, or have a readily accessible means for indication and reset~~

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

Statement of Problem and Substantiation for Public Comment

The proposed language follows the language of section 210.8 for GFCI protection of branch circuits. The requirements of 210.8 are well understood and replicating that language will reduce interpretation question.

Related Item

- FR 8534

Submitter Information Verification

Submitter Full Name: Thomas Papallo

Organization: Siemens

Affiliation: Siemens

Street Address:

City:

State:

Zip:

Submittal Date: Thu Jul 19 16:44:56 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7799-NFPA 70-2018

Statement: Utilizing the proposed wording clarifies the requirement and makes use of existing language in the Code. The word receptacle was removed and an informational note was added to emphasize that the requirement is for ground fault protection, not a device. This change allows for other methods of compliance.

**Public Comment No. 1325-NFPA 70-2018 [Section No. 625.60(E)]**

(E) On-Board Inverters.

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

Statement of Problem and Substantiation for Public Comment

There are no mechanisms currently in place in the United States for an AHJ (authority having jurisdiction) to inspect on-vehicle components, and hence this requirement is impractical and unenforceable. NFPA needs to work with SAE to generate requirements that will actually impact vehicle design. In the case of this requirement, the DC to AC inverters that power 120V AC outlets are generally outside the passenger compartment. In some cases, the functionality is incorporated into a device that also provides other functions and hence the inverter is not a separate device that can be listed. An AHJ would likely need to perform significant vehicle disassembly to verify this requirement. In most cases an AHJ would not have the training, tools, skills or experience to safely verify this requirement in the field.

Related Item

- No AHJ inspection method for DC-AC Inverters • FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submission Date: Mon Aug 27 08:53:27 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7800-NFPA 70-2018](#)
Statement: The requirement for listing of on board inverters was removed since GFCI protection is required and provides methods of personal protection.

**Public Comment No. 2038-NFPA 70-2018 [Section No. 625.60(E)]**

~~(E) On-Board Inverters.~~

~~The on-board inverter intended to supply the receptacle shall be listed and included in the interactive equipment evaluation. See 625.48 .~~

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA_70- NEC2020_FR8534_Ford_Comments_2018Aug30.pdf	Ford Comments on NFPA 70- NEC2020	

Statement of Problem and Substantiation for Public Comment

Existing or agreed upon procedures for listing inverters does not currently exist for automobile components. The necessary requirements for vibration and other unique use cases would be different than those normally encountered by listing agencies. The decentralization of the inverter in addition to the necessary associated components to evaluate the inverter would make separate bench testing difficult to impossible. Finally, a listing requirement could hamper the implementation of necessary vehicle field fixes.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: Rebecca Shelby
Organization: Ford Motor Company
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 30 15:25:42 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7800-NFPA 70-2018](#)
Statement: The requirement for listing of on board inverters was removed since GFCI protection is required and provides methods of personal protection.



Bob Holycross
Sustainability & Vehicle Environmental Matters
Sustainability, Environment & Safety Engineering
Ford Motor Company

Ford World Headquarters
One American Road
Dearborn, MI 48126-2738 USA

August 30, 2018

Mr. Christian Dubay,
Vice President,
Codes & Standards and Chief Engineer
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Subject: Proposed updates to U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534

Dear Mr. Dubay:

Thank you for giving Ford Motor Company (Ford) the opportunity to provide comments on the proposed changes to the National Fire Protection Association (NFPA) U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534 (the Code). Ford appreciates your consideration of these comments for the next draft review.

Safety continues to be one of the highest priorities in the design of Ford vehicles. Ford's corporate safety policy outlines our commitment to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions. This helps us meet or exceed both applicable laws and regulations, and the needs and expectations of our customers in a variety of situations.

Ford appreciates the NFPA's goal to proactively update the Code for well-defined and consistent standards. However, any on-vehicle requirements should be consistent with existing roles within industry standards development by having separate infrastructure requirements addressed by NFPA codes and on-vehicle requirements addressed through the SAE International standards process. SAE standards are the recognized source for automobile standards and often referenced/adopted in federal regulations and standards. Therefore, Ford recommends that any references to establish standards on automotive vehicles be removed from the proposed Code updates.

While the NFPA Code is not a state regulation, these regulations serve as a model for state legislation. Individual state adoption of different versions of the Code could raise issues of unique, individual state-by-state requirements for motor vehicles, resulting in requiring different vehicles for different states and hamper correction of any in-field vehicle issues. In addition, the ability for states to enforce on-vehicle Code requirements will be a complex and almost impossible task with many components being installed within other larger systems and/or hidden from view.

SAE International also develops motor vehicle standards that may influence and/or form the basis for Federal Motor Vehicle Safety Standards (FMVSS). For example, in September 2017, NHTSA published a Final Rule amending FMVSS 305 *Electric-Powered Vehicles: Electrolyte Spillage and Electrical Shock Protection*. See Final Rule, 82 Fed. Reg. 44946 (Sept. 27, 2017). This Final Rule includes in-use requirements and revised crash requirements, which was based on SAE J1766, "Recommended practice for electric, fuel cell, and hybrid electric vehicle crash integrity testing," January 2014. Therefore, Ford

would urge NFPA to work with SAE International when assessing the need for potential additional requirements for both on- and off-vehicle safety.

Moreover, the Scope of the Code specifically does not allow for regulations of automotive vehicles, by stating in Article 90.2 (B):

Not Covered. This Code does not cover the following

(1) Installations in...automotive vehicles other than mobile homes and recreational vehicles.

Ford also wanted to provide the NFPA with some specific technical comments regarding FR#8534, Article 625. While the spirit of the proposed requirements may be well intentioned for the automobile specific 120V outlets, the proposed requirements from a technical perspective add complexity without increasing safety.

625.60 (C). Requiring overcurrent protection be integrated into to the receptacle would increase complexity when other more effective, reliable approaches are possible through centralization with no compromise to safety.

625.60 (D). Regarding the requirement for a GFCI in each receptacle, the desired function can be achieved without having a GFCI integral to each receptacle. This would again increase complexity with no additional safety benefit. The availability of an automotive grade GFCI capable of operating in various non-stationary conditions should also be considered.

625.60 (E). Existing or agreed upon procedures for listing inverters does not currently exist for automobile components. The necessary requirements for vibration and other unique use cases would be different than those normally encountered by listing agencies. The decentralization of the inverter in addition to the necessary associated components to evaluate the inverter would make separate bench testing difficult to impossible. Finally, a listing requirement could hamper the implementation of necessary vehicle field fixes.

625.60 (F). Having a visual marking requirement stricter than other similar use cases such as home receptacles is not necessary or beneficial to the customer.

Finally, Ford supports the efforts by NFPA to allow for bi-directional power as this will be a critical future technology. However, on-vehicle safety standards development fall under the role of SAE International as the recognized source of automobile specifications. In order to develop standards that align with existing, industry-wide automotive standards, Ford recommends that all references to on-vehicle standards be removed from the proposed Code standards.

Thank you for considering these comments. If you have any questions, please feel free to contact Rebecca Shelby at rking25@ford.com, or at (313) 248-8010.

Sincerely,



(for Bob Holycross)

Bob Holycross
Director, Sustainability & Vehicle Environmental Matters
Ford Motor Company

cc:

Dawn Bellis
Mary Maynard
Linda Fuller

**Public Comment No. 1324-NFPA 70-2018 [Section No. 625.60(F)]****(F) Marking.**

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Statement of Problem and Substantiation for Public Comment

The marking requirement goes well beyond what is required for off-vehicle outlets and CMP-12 has given no justification of why this should be required. Most manufactures do put this information in the vehicle owner's manual, which is where most consumers expect to find information on the use and operation of their vehicle. Furthermore, most (all?) known automotive systems have self-protection circuits that prevent the user from drawing excessive power.

Related Item

- Marking not required for buildings • FR-8534

Submitter Information Verification

Submitter Full Name: James Tarchinski
Organization: General Motors Company
Affiliation: SAE International
Street Address:
City:
State:
Zip:
Submittal Date: Mon Aug 27 08:45:36 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7801-NFPA 70-2018](#)
Statement: The marking is used to inform the user what current capabilities exist. As this is controlled, most likely in the inverter system, it can be verified and shown reliable. Based on this marking should not be required.

**Public Comment No. 2039-NFPA 70-2018 [Section No. 625.60(F)]**

~~(F) Marking.~~

~~Marking shall be provided to inform the user of the maximum total supply current. The marking shall be located where visible to the user when using the receptacle.~~

Additional Proposed Changes

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
NFPA_70- NEC2020_FR8534_Ford_Comments_2018Aug30.pdf	Ford Comments on NFPA 70- NEC2020	

Statement of Problem and Substantiation for Public Comment

Having a visual marking requirement stricter than other similar use cases such as home receptacles is not necessary or beneficial to the customer.

Related Item

- FR-8534

Submitter Information Verification

Submitter Full Name: Rebecca Shelby
Organization: Ford Motor Company
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 30 15:27:41 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7801-NFPA 70-2018
Statement: The marking is used to inform the user what current capabilities exist. As this is controlled, most likely in the inverter system, it can be verified and shown reliable. Based on this marking should not be required.



Bob Holycross
Sustainability & Vehicle Environmental Matters
Sustainability, Environment & Safety Engineering
Ford Motor Company

Ford World Headquarters
One American Road
Dearborn, MI 48126-2738 USA

August 30, 2018

Mr. Christian Dubay,
Vice President,
Codes & Standards and Chief Engineer
National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

Subject: Proposed updates to U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534

Dear Mr. Dubay:

Thank you for giving Ford Motor Company (Ford) the opportunity to provide comments on the proposed changes to the National Fire Protection Association (NFPA) U.S. National Electrical Code, NFPA 70 – NEC 2020, FR#8534 (the Code). Ford appreciates your consideration of these comments for the next draft review.

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would urge NFPA to work with SAE International when assessing the need for potential additional requirements for both on- and off-vehicle safety.

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625.60 (C). Requiring overcurrent protection be integrated into to the receptacle would increase complexity when other more effective, reliable approaches are possible through centralization with no compromise to safety.

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625.60 (F). Having a visual marking requirement stricter than other similar use cases such as home receptacles is not necessary or beneficial to the customer.

Finally, Ford supports the efforts by NFPA to allow for bi-directional power as this will be a critical future technology. However, on-vehicle safety standards development fall under the role of SAE International as the recognized source of automobile specifications. In order to develop standards that align with existing, industry-wide automotive standards, Ford recommends that all references to on-vehicle standards be removed from the proposed Code standards.

Thank you for considering these comments. If you have any questions, please feel free to contact Rebecca Shelby at rking25@ford.com, or at (313) 248-8010.

Sincerely,



(for Bob Holycross)

Bob Holycross
Director, Sustainability & Vehicle Environmental Matters
Ford Motor Company

cc:

Dawn Bellis
Mary Maynard
Linda Fuller

**Public Comment No. 1196-NFPA 70-2018 [Section No. 626.2]****626.2 Definitions.****Cable Management System (Electrified Truck Parking Spaces).**

An apparatus designed to control and organize unused lengths of cable or cord at electrified truck parking spaces.

Cord Connector.

A device that, by inserting it into a truck flanged surface inlet, establishes an electrical connection to the truck for the purpose of providing power for the on-board electric loads and may provide a means for information exchange. This device is part of the truck coupler.

Disconnecting Means, Parking Space.

The necessary equipment usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors in an electrified truck parking space and intended to constitute the means of cutoff for the supply to that truck.

Electrified Truck Parking Space.

A truck parking space that has been provided with an electrical system that allows truck operators to connect their vehicles while stopped and to use off-board power sources in order to operate on-board systems such as air conditioning, heating, and appliances, without any engine idling.

Informational Note: An electrified truck parking space also includes dedicated parking areas for heavy-duty trucks at travel plazas, warehouses, shipper and consignee yards, depot facilities, and border crossings. It does not include areas such as the shoulders of highway ramps and access roads, camping and recreational vehicle sites, residential and commercial parking areas used for automotive parking or other areas where ac power is provided solely for the purpose of connecting automotive and other light electrical loads, such as engine block heaters, and at private residences.

Electrified Truck Parking Space Wiring Systems.

All of the electrical wiring, equipment, and appurtenances related to electrical installations within an electrified truck parking space, including the electrified parking space supply equipment.

Overhead Gantry.

A structure consisting of horizontal framework, supported by vertical columns spanning above electrified truck parking spaces, that supports equipment, appliances, raceway, and other necessary components for the purpose of supplying electrical, HVAC, internet, communications, and other services to the spaces.

Separable Power Supply Cable Assembly.

A flexible cord or cable, including ungrounded, grounded, and equipment grounding conductors, provided with a cord connector, an attachment plug, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the truck or TRU flanged surface inlet.

Transport Refrigerated Unit (TRU).

A trailer or container, with integrated cooling or heating, or both, used for the purpose of maintaining the desired environment of temperature-sensitive goods or products.

Truck.

A motor vehicle designed for the transportation of goods, services, and equipment.

Truck Coupler.

A truck flanged surface inlet and mating cord connector.

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 truck flanged surface inlet is considered to be part of the truck and not part of the electrified truck parking space supply equipment.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_175.pdf	70_CN 175

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 175 in the First Draft Report on Public Input No. 1914.

The Correlating Committee directs the panel to take action on PI 1914 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections.

This action will be considered as a public comment.

Related Item

- PI 1914

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Fri Aug 24 11:08:43 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7811-NFPA 70-2018](#)

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 175-NFPA 70-2018 [Section No. 626.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submittal Date: Fri May 11 09:59:01 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1914 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✔ This item has passed ballot

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 1944-NFPA 70-2018 [Section No. 626.2]

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

Cable Management System (Electrified Truck Parking Spaces).

An apparatus designed to control and organize unused lengths of cable or cord at electrified truck parking spaces.

Cord Connector.

A device that, by inserting it into a truck flanged surface inlet, establishes an electrical connection to the truck for the purpose of providing power for the on-board electric loads and may provide a means for information exchange. This device is part of the truck coupler.

Disconnecting Means, Parking Space.

The necessary equipment usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors in an electrified truck parking space and intended to constitute the means of cutoff for the supply to that truck.

Electrified Truck Parking Space.

A truck parking space that has been provided with an electrical system that allows truck operators to connect their vehicles while stopped and to use off-board power sources in order to operate on-board systems such as air conditioning, heating, and appliances, without any engine idling.

Informational Note: An electrified truck parking space also includes dedicated parking areas for heavy-duty trucks at travel plazas, warehouses, shipper and consignee yards, depot facilities, and border crossings. It does not include areas such as the shoulders of highway ramps and access roads, camping and recreational vehicle sites, residential and commercial parking areas used for automotive parking or other areas where ac power is provided solely for the purpose of connecting automotive and other light electrical loads, such as engine block heaters, and at private residences.

Electrified Truck Parking Space Wiring Systems.

All of the electrical wiring, equipment, and appurtenances related to electrical installations within an electrified truck parking space, including the electrified parking space supply equipment.

Overhead Gantry.

A structure consisting of horizontal framework, supported by vertical columns spanning above electrified truck parking spaces, that supports equipment, appliances, raceway, and other necessary components for the purpose of supplying electrical, HVAC, internet, communications, and other services to the spaces.

Separable Power Supply Cable Assembly.

A flexible cord or cable, including ungrounded, grounded, and equipment grounding conductors, provided with a cord connector, an attachment plug, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the truck or TRU flanged surface inlet.

Transport Refrigerated Unit (TRU).

A trailer or container, with integrated cooling or heating, or both, used for the purpose of maintaining the desired environment of temperature-sensitive goods or products.

Truck.

A motor vehicle designed for the transportation of goods, services, and equipment.

Truck Coupler.

A truck flanged surface inlet and mating cord connector.

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 truck flanged surface inlet is considered to be part of the truck and not part of the electrified truck parking space supply equipment.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1914, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 626, therefore the additional language will explicitly share that information with the Code user. Use of the terms as defined in this Article in other locations in the Code would be inappropriate, therefore it is important to clearly indicate that their use is confined to the requirements in this Article.

Related Item

- PI 1914

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 12:53:21 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7811-NFPA 70-2018](#)

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.

**Public Comment No. 1604-NFPA 70-2018 [Section No. 626.24(D)]**

(D) Ground-Fault Circuit-Interrupter Protection for Personnel.

~~The~~ In addition to the requirements in 210.8, the electrified truck parking space equipment shall be designed and constructed such that all receptacle outlets in 626.24 are provided with ground-fault circuit-interrupter protection for personnel.

Statement of Problem and Substantiation for Public Comment

This Public Comment is the work of an NEC Correlating Committee task group directed to develop standardized text to improve correlation, clarity and usability of the NEC. This effort identified GFCI requirements that supplement or modify the general requirements of 210.8. The present GFCI requirements throughout the NEC were developed by various Technical Committees when the general GFCI requirements in 210.8 were limited to dwelling units. The consequences of time and various committees working to enhance safety have created significant correlation issues with the general requirements in 210.8. The arrangement of the NEC, as detailed in 90.3 clarifies that the general requirements of Chapters 1 through 4 apply "generally to all electrical installations." The work of this Task Group resulted in 41 public comments to provide necessary correlation, clarity and usability. The task group's work was identified in and based upon Correlating Committee Note 152 to the 2020 First Revisions. The Task Group members consisted of Jim Dollard, Chair, Steve Campolo, Donny Cook, Tom Domitrovich, Mark Hilbert, Keith Lofland, Alan Manche and Steve Rood.

Related Item

- CCN 152

Submitter Information Verification

Submitter Full Name: James Dollard

Organization: IBEW Local Union 98

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 13:04:40 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7812-NFPA 70-2018](#)

Statement: As Article 210 applies generally to all installations, reference back to this Article, paragraph 210.8, was added to reinforce and correlate the requirements.



Public Comment No. 77-NFPA 70-2018 [Section No. 626.25(B)(4)]

(4) Attachment Plug.

The attachment plug(s) shall be listed, by itself or as part of a cord set, 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. If a right-angle cap is used, the configuration shall be oriented so that the grounding member is farthest from the cord. Where a flexible cord is provided, the attachment plug shall comply with 250.138(A).

(a) *Connection to 20-Ampere Receptacle.* A separable power-supply cable assembly for connection to a truck flanged surface inlet, rated at 20 amperes, shall have a non-locking-type attachment plug that shall be 2-pole, 3-wire grounding type rated 20 amperes, 125 volts and intended for use with the 20-ampere, 125-volt receptacle.

Exception: A separable power-supply cable assembly, ~~rated 15 amperes,~~ provided for the connection of only an engine block heater- ~~only,~~ shall have an attachment plug ~~that shall be~~ of the 2-pole, 3-wire grounding type, ~~rated 15 amperes, 125 volts.~~

Informational Note: For non-locking- and grounding-type 15- or 20-ampere plug and receptacle configurations, see ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, Figure 5-15 or Figure 5-20.

(b) *Connection to 30-Ampere Receptacle.* A separable power-supply cable assembly for connection to a truck flanged surface inlet, rated at 30 amperes, shall have an attachment plug that shall be 3-pole, 4-wire grounding type rated 30 amperes, 208Y/120 volts or 125/250 volts, and intended for use with the receptacle in accordance with 626.24(B)(2). The 125/250-volt attachment plug shall be permitted to be used on a 208Y/120-volt, single-phase circuit.

Informational Note: For various configurations of 30-ampere pin and sleeve plugs, see ANSI/UL 1686-2012, *Standard for Pin and Sleeve Configurations*, Figure C2.10 or Part C3.

Statement of Problem and Substantiation for Public Comment

I believe the wording in the Exception should have the first (and redundant)" , rated 15 amperes," deleted since the fully inclusive circuit description follows later in the text.

Move the term "only" for clarity ("Only God knows" and "God only knows" don't say the same thing).

And add a comma before "shall" for proper separation of the preceding phrase,

And delete "that shall be" and replace with "of the" - and add a comma after "type" for description clarity.

Related Item

- 8609

Submitter Information Verification

Submitter Full Name: Scott Cline

Organization: McMurtrey Electric, Inc.

Street Address:

City:

State:

Zip:

Submission Date: Wed Jun 27 19:47:58 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7814-NFPA 70-2018](#)

Statement: An editorial change was needed to clarify and make the exception more readable.

**Public Comment No. 588-NFPA 70-2018 [Section No. 626.30(A)]****(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.

Exception: Private facilities shall be permitted to supply TRU spaces with other supply systems based on site availability provided they are engineered systems that utilize listed devices and meet all other pertinent code requirements.

Statement of Problem and Substantiation for Public Comment

The electric utility industry supports the expansion of permissible power supply options proposed by FR 8610. We believe, however, that the concept of allowing other, as-yet unspecified, power supply options for private fleets and private facilities as originally proposed in PI 3765 should have been retained in the FR language.

By limiting the power supply options, along with their respective receptacles, cables, and connectors, to those specified on a particular list the code could, and likely will, prevent private companies from field-testing innovative systems on their own internal fleets utilizing their own private facilities, and therefore may well prevent the timely development of safer, more efficient systems than those on that enumerated list, even after the proposed expansion via FR 8610. The electric utility industry recommends adding language similar to that of the original PI allowing the use of other power supply systems at private facilities provided they are engineered systems that utilize listed devices and meet all other pertinent code requirements.

Related Item

• FR-8610 • PI-3765 • FR-8611 • FR-8612 • FR-8613

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 13 11:33:55 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The submitter has not provided sufficient technical substantiation to deviate from what is already required in this section.

**Public Comment No. 589-NFPA 70-2018 [Section No. 626.31(C)]****(C)** Receptacles.

All receptacles 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
- (2) A 60-ampere, 208-volt, 3-phase, 3-pole, 4-wire receptacle
- (3) A 20-ampere, 1000-volt, 3-phase, 3-pole, 4-wire receptacle, pin and sleeve type
- (4) A 60-ampere, 250-volt, 3-phase, 3-pole, 4-wire receptacle
- (5) A 60-ampere, 480-volt, 3-phase, 3-pole, 4-wire receptacle

Exception: Private facilities shall be permitted to supply TRU spaces with other supply systems based on site availability provided they are engineered systems that utilize listed devices and meet all other pertinent code requirements.

Informational Note: Complete details of the 30-ampere pin and sleeve receptacle configuration for refrigerated containers (TRUs) can be found in ANSI/UL 1686-2012, *Standard for Pin and Sleeve Configurations*, Figure C2.11. For various configurations of 60-ampere pin and sleeve receptacles, see ANSI/UL1686.

Statement of Problem and Substantiation for Public Comment

The electric utility industry supports the expansion of permissible power supply receptacle options proposed by FR 8611. We believe, however, that the concept of allowing other, as-yet unspecified, receptacle options for private fleets and private facilities should be permitted for the development of new technologies.

By limiting the receptacle options to those specified on a particular list the code may prevent private companies from field-testing innovative connection systems on their own internal fleets utilizing their own private facilities, and therefore may well prevent the timely development of safer, more efficient connection systems than those on that enumerated list, even after the proposed expansion via FR 8611. The electric utility industry recommends adding language allowing the use of other connection systems at private facilities provided they are engineered systems that utilize listed devices and meet all other pertinent code requirements.

Related Item

• FR-8611 • PI-3767 • FR-8610 • FR-8612 • FR-8613

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 13 11:47:04 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution:

The submitter has not provided sufficient technical substantiation to deviate from what is already required in this section.

**Public Comment No. 590-NFPA 70-2018 [Section No. 626.32(A)]****(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

Exception: Private facilities shall be permitted to supply TRU spaces with other supply systems based on site availability provided they are engineered systems that utilize listed devices and meet all other pertinent code requirements.

Statement of Problem and Substantiation for Public Comment

The electric utility industry supports the expansion of permissible cable assembly rating options proposed by FR 8612. We believe, however, that the concept of allowing other, as-yet unspecified, cable assembly rating options for private fleets and private facilities should be permitted for the development of new technologies.

By limiting the cable assembly rating options to those specified on a particular list the code may prevent private companies from field-testing innovative connection systems on their own internal fleets utilizing their own private facilities, and therefore may well prevent the timely development of safer, more efficient connection systems, even after the proposed expansion via FR 8612. The electric utility industry recommends adding language permitting other cable assembly rating options for private facilities provided they are engineered systems that utilize listed devices and meet all other pertinent code requirements.

Related Item

• FR-8612 • PI-3769 • FR-8610 • FR-8611 • FR-8613

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 13 12:03:27 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The submitter has not provided sufficient technical substantiation to deviate from what is already required in this section.

**Public Comment No. 591-NFPA 70-2018 [Section No. 626.32(C)]****(C)** Attachment Plug(s) and Cord Connector(s).

Where a flexible cord is provided with an attachment plug and cord connector, they shall comply with 250.138(A). The attachment plug(s) and cord connector(s) shall be listed, by itself or as part of the power-supply cable 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 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

Exception: Private facilities shall be permitted to supply TRU spaces with other supply systems based on site availability provided they are engineered systems that utilize listed devices and meet all other pertinent code requirements.

Informational Note: Complete details of the 30-ampere pin and sleeve attachment plug and cord connector configurations for refrigerated containers (TRUs) can be found in ANSI/UL 1686-2012, *Standard for Pin and Sleeve Configurations*, Figures C2.12 and C2.11. For various configurations of 60-ampere pin and sleeve attachment plugs and cord connectors, see ANSI/UL 1686.

Statement of Problem and Substantiation for Public Comment

The electric utility industry supports the expansion of permissible plug and connector options proposed by FR 8613. We believe, however, that the concept of allowing other, as-yet unspecified, plug or connector options for private fleets and private facilities should be permitted for the development of new technologies.

By limiting the plug or connector options to those specified on a particular list the code may prevent private companies from field-testing innovative connection systems on their own internal fleets utilizing their own private facilities, and therefore may well prevent the timely development of safer, more efficient connection systems, even after the proposed expansion via FR 8613. The electric utility industry recommends adding language permitting other plug or connector options for private facilities provided that those plugs or connectors engineered systems that utilize listed devices and meet all other pertinent code requirements.

Related Item

• FR-8613 • PI-3775 • FR-8610 • FR-8611 • FR-8612

Submitter Information Verification

Submitter Full Name: Karl Reighard

Organization: Delmarva Power and Light

Affiliation: Edison Electric Institute

Street Address:

City:

State:

Zip:

Submittal Date: Mon Aug 13 12:14:22 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected

Resolution: The submitter has not provided sufficient technical substantiation to deviate from what is already required in this section.

**Public Comment No. 1100-NFPA 70-2018 [Section No. 640.2]****640.2 Definitions.**

For purposes of this article, the following definitions apply.

Abandoned Audio Distribution Cable.

Installed audio distribution cable that is not terminated at equipment and not identified for future use with a tag.

Audio Amplifier or Pre-Amplifier.

Electronic equipment that increases the current or voltage, or both, of an audio signal intended for use by another piece of audio equipment. *Amplifier* is the term used within this article to denote an audio amplifier.

Audio Autotransformer.

A transformer with a single winding and multiple taps intended for use with an amplifier loudspeaker signal output.

Audio Signal Processing Equipment.

Electrically operated equipment that produces, processes, or both, electronic signals that, when appropriately amplified and reproduced by a loudspeaker, produce an acoustic signal within the range of normal human hearing (typically 20–20 kHz). Within this article, the terms *equipment* and *audio equipment* are assumed to be equivalent to audio signal processing equipment.

Informational Note: This equipment includes, but is not limited to, loudspeakers; headphones; pre-amplifiers; microphones and their power supplies; mixers; MIDI (musical instrument digital interface) equipment or other digital control systems; equalizers, compressors, and other audio signal processing equipment; and audio media recording and playback equipment, including turntables, tape decks and disk players (audio and multimedia), synthesizers, tone generators, and electronic organs. Electronic organs and synthesizers may have integral or separate amplification and loudspeakers. With the exception of amplifier outputs, virtually all such equipment is used to process signals (utilizing analog or digital techniques) that have nonhazardous levels of voltage or current.

Audio System.

Within this article, the totality of all equipment and interconnecting wiring used to fabricate a fully functional audio signal processing, amplification, and reproduction system.

Audio Transformer.

A transformer with two or more electrically isolated windings and multiple taps intended for use with an amplifier loudspeaker signal output.

Equipment Rack.

A framework for the support, enclosure, or both, of equipment; can be portable or stationary.

Informational Note: See EIA/ECA 310-E-2005, *Cabinets, Racks, Panels and Associated Equipment*.

Loudspeaker.

Equipment that converts an ac electric signal into an acoustic signal. The term *speaker* is commonly used to mean *loudspeaker*.

Maximum Output Power.

The maximum power delivered by an amplifier into its rated load as determined under specified test conditions.

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

Mixer.

Equipment used to combine and level match a multiplicity of electronic signals, such as from microphones, electronic instruments, and recorded audio.

Portable Equipment.

Equipment fed with portable cords or cables intended to be moved from one place to another.

Rated Output Power.

The amplifier manufacturer's stated or marked output power capability into its rated load.

Technical Power System.

An electrical distribution system where the equipment grounding conductor is isolated from the premises grounded conductor and the premises equipment grounding conductor except at a single grounded termination point within a branch-circuit panelboard, at the originating (main breaker) branch-circuit panelboard, or at the premises grounding electrode.

Informational Note: See 250.146(D) for installation requirements for isolated ground receptacles.

Temporary Equipment.

Portable wiring and equipment intended for use with events of a transient or temporary nature where all equipment is presumed to be removed at the conclusion of the event.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_176.pdf	70_CN 176

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 176 in the First Draft Report on First Revision No. 8335 & 8337.

The Correlating Committee directs the panel to take action on PI 1915 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections.

This action will be considered as a public comment.

Related Item

- FR 8335 • FR 8337

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 22 16:32:11 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7819-NFPA 70-2018](#)

Statement: This second revision edits the existing sentence below the subject line. The definitions in this section apply only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 176-NFPA 70-2018 [Section No. 640.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submittal Date: Fri May 11 09:59:44 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1915 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

[FR-8335-NFPA 70-2018](#)

[FR-8337-NFPA 70-2018](#)

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 2133-NFPA 70-2018 [Section No. 640.2]

640.2 Definitions.

~~For purposes of this article, the following definitions apply~~

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

Abandoned Audio Distribution Cable.

Installed audio distribution cable that is not terminated at equipment and not identified for future use with a tag.

Audio Amplifier or Pre-Amplifier.

Electronic equipment that increases the current or voltage, or both, of an audio signal intended for use by another piece of audio equipment. *Amplifier* is the term used within this article to denote an audio amplifier.

Audio Autotransformer.

A transformer with a single winding and multiple taps intended for use with an amplifier loudspeaker signal output.

Audio Signal Processing Equipment.

Electrically operated equipment that produces, processes, or both, electronic signals that, when appropriately amplified and reproduced by a loudspeaker, produce an acoustic signal within the range of normal human hearing (typically 20–20 kHz). Within this article, the terms *equipment* and *audio equipment* are assumed to be equivalent to audio signal processing equipment.

Informational Note: This equipment includes, but is not limited to, loudspeakers; headphones; pre-amplifiers; microphones and their power supplies; mixers; MIDI (musical instrument digital interface) equipment or other digital control systems; equalizers, compressors, and other audio signal processing equipment; and audio media recording and playback equipment, including turntables, tape decks and disk players (audio and multimedia), synthesizers, tone generators, and electronic organs. Electronic organs and synthesizers may have integral or separate amplification and loudspeakers. With the exception of amplifier outputs, virtually all such equipment is used to process signals (utilizing analog or digital techniques) that have nonhazardous levels of voltage or current.

Audio System.

Within this article, the

The totality of all equipment and interconnecting wiring used to fabricate a fully functional audio signal processing, amplification, and reproduction system.

Audio Transformer.

A transformer with two or more electrically isolated windings and multiple taps intended for use with an amplifier loudspeaker signal output.

Equipment Rack.

A framework for the support, enclosure, or both, of equipment; can be portable or stationary.

Informational Note: See EIA/ECA 310-E-2005, *Cabinets, Racks, Panels and Associated Equipment*.

Loudspeaker.

Equipment that converts an ac electric signal into an acoustic signal. The term *speaker* is commonly used to mean *loudspeaker*.

Maximum Output Power.

The maximum power delivered by an amplifier into its rated load as determined under specified test conditions.

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

Mixer.

Equipment used to combine and level match a multiplicity of electronic signals, such as from microphones, electronic instruments, and recorded audio.

Portable Equipment.

Equipment fed with portable cords or cables intended to be moved from one place to another.

Rated Output Power.

The amplifier manufacturer's stated or marked output power capability into its rated load.

Technical Power System.

An electrical distribution system where the equipment grounding conductor is isolated from the premises grounded conductor and the premises equipment grounding conductor except at a single grounded termination point within a branch-circuit panelboard, at the originating (main breaker) branch-circuit panelboard, or at the premises grounding electrode.

Informational Note: See 250.146(D) for installation requirements for isolated ground receptacles.

Temporary Equipment.

Portable wiring and equipment intended for use with events of a transient or temporary nature where all equipment is presumed to be removed at the conclusion of the event.

Statement of Problem and Substantiation for Public Comment

The proposed language revisions are part of a global effort to provide guidance to the user of the code regarding applicability of definitions located in the .2 sections within individual articles. The language makes it clear that the definitions are limited to Article 640. This is a followup to PI 1915, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 640, and the revised language explicitly communicates that to the code user while correlating with actions taken elsewhere in the code.

Related Item

- PI 1915

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 19:55:31 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7819-NFPA 70-2018](#)

Statement: This second revision edits the existing sentence below the subject line. The definitions in this section apply only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.

**Public Comment No. 1127-NFPA 70-2018 [Definition: Technical Power System.]****Technical Power System.**

An electrical distribution system where the equipment grounding conductor is isolated from the premises grounded conductor and the premises equipment grounding conductor except at a single grounded termination point within a branch-circuit panelboard, at the originating (main breaker) branch-circuit panelboard, or at the premises grounding electrode.

Informational Note: See 250.146(D) for installation requirements for isolated ground receptacles.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_196.pdf	70_CN196

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 196 in the First Draft Report on First Revision No. 8337.

The Correlating Committee directs the panel to reconsider the text of the Informational Note with respect to containing requirements in accordance with the NEC Style Manual.

This action will be considered as a public comment.

Related Item

- First Revision No. 8337

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 23 14:27:09 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7820-NFPA 70-2018

Statement: Deletion of the informational note following the definition of Technical Power System complies with the Correlating Committee directive to remove requirements from an informational note.



Correlating Committee Note No. 196-NFPA 70-2018 [Definition: Technical Power System.]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submittal Date: Fri May 11 11:43:39 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to reconsider the text of the Informational Note with respect to containing requirements in accordance with the NEC Style Manual.

This action will be considered as a public comment.

First Revision No. 8337-NFPA 70-2018 [Definition: Technical Power System.]

Ballot Results

✔ This item has passed ballot

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1606-NFPA 70-2018 [Section No. 640.10(A)]****(A) Equipment Supplied by Branch-Circuit Power.**

Audio system equipment supplied by branch-circuit power shall not be placed horizontally within 1.5 m (5 ft) of the inside wall of a pool, spa, hot tub, or fountain, or within 1.5 m (5 ft) of the prevailing or tidal high water mark. ~~The~~ In addition to the requirements in 210.8(B), the equipment shall be provided with branch-circuit power protected by a ground-fault circuit interrupter where required by other articles.

Statement of Problem and Substantiation for Public Comment

This Public Comment is the work of an NEC Correlating Committee task group directed to develop standardized text to improve correlation, clarity and usability of the NEC. This effort identified GFCI requirements that supplement or modify the general requirements of 210.8. The present GFCI requirements throughout the NEC were developed by various Technical Committees when the general GFCI requirements in 210.8 were limited to dwelling units. The consequences of time and various committees working to enhance safety have created significant correlation issues with the general requirements in 210.8. The arrangement of the NEC, as detailed in 90.3 clarifies that the general requirements of Chapters 1 through 4 apply "generally to all electrical installations." The work of this Task Group resulted in 41 public comments to provide necessary correlation, clarity and usability. The task group's work was identified in and based upon Correlating Committee Note 152 to the 2020 First Revisions. The Task Group members consisted of Jim Dollard, Chair, Steve Campolo, Donny Cook, Tom Domitrovich, Mark Hilbert, Keith Lofland, Alan Manche and Steve Rood.

Related Item

- CCN 152

Submitter Information Verification

Submitter Full Name: James Dollard

Organization: IBEW Local Union 98

Street Address:

City:

State:

Zip:

Submittal Date: Wed Aug 29 13:07:15 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7821-NFPA 70-2018

Statement: As Article 210 applies generally to all installations, reference back to Section 210.8(B) was added to reinforce and correlate the requirements.

**Public Comment No. 1128-NFPA 70-2018 [Section No. 645.2]****645.2 Definitions.****Abandoned Supply Circuits and Interconnecting Cables.**

Installed supply circuits and interconnecting cables that are not terminated at equipment and not identified for future use with a tag.

Critical Operations Data System.

An information technology equipment system that requires continuous operation for reasons of public safety, emergency management, national security, or business continuity.

Information Technology Equipment Room.

A room within the information technology equipment area that contains the information technology equipment. [75:3.3.9]

Remote Disconnect Control.

An electric device and circuit that controls a disconnecting means through a relay or equivalent device.

Zone.

A physically identifiable area (such as barriers or separation by distance) within an information technology equipment room, with dedicated power and cooling systems for the information technology equipment or systems.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_178.pdf	70_CN178

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 178 in the First Draft Report on Public Input No. 1916.

The Correlating Committee directs the panel to take action on PI 1916 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Related Item

- Public Input No. 1916

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 23 14:28:54 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7822-NFPA 70-2018](#)

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply only to this article due to the movement of the definition for "Information Technology Equipment Room" to Article 100.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 178-NFPA 70-2018 [Section No. 645.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submission Date: Fri May 11 10:02:13 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1916 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1947-NFPA 70-2018 [Section No. 645.2]**

645.2 Definitions. The definitions in this section shall apply only within this article and Article 646.

Abandoned Supply Circuits and Interconnecting Cables.

Installed supply circuits and interconnecting cables that are not terminated at equipment and not identified for future use with a tag.

Critical Operations Data System.

An information technology equipment system that requires continuous operation for reasons of public safety, emergency management, national security, or business continuity.

Information Technology Equipment Room.

A room within the information technology equipment area that contains the information technology equipment. [75:3.3.9]

Remote Disconnect Control.

An electric device and circuit that controls a disconnecting means through a relay or equivalent device.

Zone.

A physically identifiable area (such as barriers or separation by distance) within an information technology equipment room, with dedicated power and cooling systems for the information technology equipment or systems.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1916, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 645, therefore the additional language will explicitly share that information with the Code user. However, there is language in 646.2 that indicates these definitions also apply within Article 646, so that reference was added to avoid any perception of conflict.

Related Item

- PI 1916

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 12:56:22 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7822-NFPA 70-2018](#)

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply only to this article due to the movement of the definition for "Information Technology Equipment Room" to Article 100.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code

making panel responsibility to each definition.

**Public Comment No. 118-NFPA 70-2018 [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, 800.26, 805.26, and 820.26 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: 725.135(C) and Table 725.154
- (3) Fire alarm systems: 760.53(B)(2), 760.135(C), and Table 760.154
- (4) Optical fiber cables: 770.113(C), and Table 770.154(a)
- (5) Communications circuits: 805.113(C) and Table 805.154(a), ~~(b), and (c)~~
- (6) CATV and radio distribution systems: 820.113(C) and Table 820.154(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 725.121(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits. Sections 725.139(D)(1) and 805.133(A)(1)(c) shall apply to the electrical classification of Class 2 and Class 3 circuits in the same cable with communications 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.

800.110, 800.113 and 800.154 shall apply to cable routing assemblies and communications raceways. Parts I, II, III, IV, and V of Article 805 shall apply to ~~cable routing assemblies,~~ communications wires, cables, ~~raceways,~~ and equipment installed in an information technology equipment room. Only communications wires and cables listed in accordance with 805.179, cable routing assemblies and communications raceways listed in accordance with ~~805.800~~ 805.182, and communications equipment listed in accordance with 805.170 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 Part I of 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 Article 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 820.179 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 Comment

FR 7512 created a new general article, Article 800, for Chapter 8. The old Article 800 was renumbered to Article 805. PC 61 moves the requirements for cable routing assemblies and communications raceways from Article 805 (formerly 800) to the new Article 800.

Related Public Comments for This Document**Related Comment**

[Public Comment No. 119-NFPA 70-2018 \[Section No. 646.3\]](#)

[Public Comment No. 119-NFPA 70-2018 \[Section No. 646.3\]](#)

[Public Comment No. 120-NFPA 70-2018 \[Section No. 645.10\(B\)\]](#)

Relationship

Coordinating PC for Article 646

Related Item

- FR 7512

Submitter Information Verification

Submitter Full Name: Stanley Kaufman

Organization: CableSafe Inc

Affiliation: PLASTICS Industry Association

Street Address:

City:

State:

Zip:

Submittal Date: Sat Jun 30 15:11:34 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7823-NFPA 70-2018](#)

Statement: The panel action on PC 118 is intended to correlate with CMP 16 second revision actions to create a new general article, Article 800, in Chapter 8 and move common requirements from multiple locations in the chapter to Article 800.



Public Comment No. 120-NFPA 70-2018 [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: For further information, see *NFPA 72-2016, National Fire Alarm and Signaling Code*.

- (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)(5).

Table 645.10(B)(5) Cables Installed Under Raised Floors

<u>Cable Type</u>	<u>Applicable Sections</u>
Branch circuits under raised floors	645.5(E)(1)
Supply cords of listed information technology equipment	645.5(E)(2)(a), 300.22(C)
Class 2 and Class 3 remote control and PLTC cables in other spaces used for environmental air (plenums)	725.135(C) and Table 725.154
Optical fiber cable in other spaces used for environmental air (plenums)	770.113(C) and Table 770.154(a)
Communications wire-wires and cable cables , cable routing assemblies, and communications raceways in other spaces used for environmental air (plenums)	800.113(C), 805.113(C) and , Tables 805.800.154(a) , & (b) , & (c and 805.154(a)
Coaxial CATV and radio distribution cables in other spaces used for environmental air (plenums)	820.113(C) and Table 820.154(a)

Statement of Problem and Substantiation for Public Comment

FR 7512 created a new general article, Article 800, for Chapter 8. The old Article 800 was renumbered to Article 805. PC 61 moves the requirements for cable routing assemblies and communications raceways from Article 805 (formerly 800) to the new Article 800.

Related Public Comments for This Document

<u>Related Comment</u>	<u>Relationship</u>
Public Comment No. 118-NFPA 70-2018 [Section No. 645.3]	
Public Comment No. 119-NFPA 70-2018 [Section No. 646.3]	

Related Item

- FR 7512

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
Organization: CableSafe In
Affiliation: PLASTICS Industry Association
Street Address:

City:
State:
Zip:
Submittal Date: Sat Jun 30 17:13:11 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7824-NFPA 70-2018
Statement: The panel action on PC 120 is intended to correlate with CMP 16 second revision actions to create a new general article, Article 800, in Chapter 8 and move common requirements from multiple locations in the chapter to Article 800.

**Public Comment No. 1129-NFPA 70-2018 [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
- (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: Specific electronic equipment disconnecting means requirements for backup battery power sources are found in UL 1778-2014 (R2017), *Uninterruptible Power Systems*.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_197.pdf	70_CN197

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 197 in the First Draft Report on First Revision No. 8351.

The Correlating Committee directs the panel to reconsider the text of the Informational Note relative to use of mandatory text such as the words “specific” and “requirements”.
This action will be considered as a public comment.

Related Item

- First Revision No. 8351

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 23 14:30:33 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-7836-NFPA 70-2018
Statement: The revised text removes the mandatory text in compliance with the Correlating Committee directive and also adds an additional relevant UL standard to the informational note.



Correlating Committee Note No. 197-NFPA 70-2018 [Section No. 645.11]

Submitter Information Verification

Submitter Full Name: Erik Hohengasser

Committee:

Submission Date: Fri May 11 11:46:14 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to reconsider the text of the Informational Note relative to use of mandatory text such as the words “specific” and “requirements”.

This action will be considered as a public comment.

First Revision No. 8351-NFPA 70-2018 [Section No. 645.11]

Ballot Results

✔ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 369-NFPA 70-2018 [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
- (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: Specific electronic equipment disconnecting means requirements for backup battery power sources are found in UL 1778-2014 (R2017), *Uninterruptible Power Systems Systems* and UL 62368-1-2014, *Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements*.

Statement of Problem and Substantiation for Public Comment

It is important to add UL 62368-1 to the informational note since it specifically covers how to design ITE battery backup to meet NEC 645.11.

UL 62368-1 includes a normative Annex DVA. Annex DVA contains US regulatory-based requirements. Annex DVA, clause M (Batteries and fuel cells, Backup battery power sources) gives product safety design and test guidance on complying with NEC Article 645.11. The text of Annex DVA, clause M is as follows:

"For equipment identified for ITE (computer) room applications, batteries integral to equipment shall incorporate a means for battery disconnect and a means for connection to the remote emergency power off circuit that disconnects the battery power source, except for battery circuits for which (1) the product of the open circuit voltage times the rating of the overcurrent protective device does not exceed 750 VA; or (2) any resistive load cannot draw more than 750 VA for more than five minutes after the mains power is disconnected. If connection to the remote emergency power off circuit is required, batteries shall be disconnected within five minutes of activating the remote emergency power off circuit."

Related Item

- Public Input No. 3488-NFPA 70-2017

Submitter Information Verification

Submitter Full Name: Joseph Prisco

Organization: IBM Corporation

Affiliation: Information Technology Industry Council

Street Address:

City:

State:

Zip:

Submission Date: Fri Aug 03 13:22:08 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7836-NFPA 70-2018

Statement: The revised text removes the mandatory text in compliance with the Correlating Committee directive and also adds an additional relevant UL standard to the informational note.

**Public Comment No. 1130-NFPA 70-2018 [Section No. 646.2]****646.2 Definitions.**

The definitions in 645.2 shall apply. For the purposes of this article, the following additional definition applies.

Modular Data Center (MDC).

Prefabricated units, rated 1000 volts or less, consisting of an outer enclosure housing multiple racks or cabinets of information technology equipment (ITE) (e.g., servers) and various support equipment, such as electrical service and distribution equipment, HVAC systems, and the like.

Informational Note No. 1: A typical construction may use a standard ISO shipping container or other structure as the outer enclosure, racks or cabinets of ITE, service-entrance equipment and power distribution components, power storage such as a UPS, and an air or liquid cooling system. Modular data centers are intended for fixed installation, either indoors or outdoors, based on their construction and resistance to environmental conditions. MDCs can be configured as an all-in-one system housed in a single equipment enclosure or as a system with the support equipment housed in separate equipment enclosures.

Informational Note No. 2: For information on listing requirements for both information technology equipment and communications equipment contained within a modular data center, see UL 60950-1-2014, *Information Technology Equipment — Safety — Part 1: General Requirements*, and UL 62368-1-2012, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*.

Informational Note No. 3: *Modular data centers* as defined in this article are sometimes referred to as containerized data centers.

Informational Note No. 4: Equipment enclosures housing only support equipment (e.g., HVAC or power distribution equipment) that are not part of a specific modular data center are not considered a modular data center as defined in this article.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_179.pdf	70_CN179

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 179 in the First Draft Report on Public Input No. 1917.

The Correlating Committee directs the panel to take action on PI 1917 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Related Item

- Public Input No. 1917

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 23 14:31:55 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7837-NFPA 70-2018](#)

Statement: The movement of "Information Technology Equipment Room" to Article 100 removes the connection to Article 645. The definition in this section applies only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 179-NFPA 70-2018 [Section No. 646.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submission Date: Fri May 11 10:03:13 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1917 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 2130-NFPA 70-2018 [Section No. 646.2]****646.2 Definitions.**

The

~~The definition in this section shall apply only within this article. The definitions in 645.2 shall also apply. For the purposes of this article, the following additional definition applies.~~

Modular Data Center (MDC).

Prefabricated units, rated 1000 volts or less, consisting of an outer enclosure housing multiple racks or cabinets of information technology equipment (ITE) (e.g., servers) and various support equipment, such as electrical service and distribution equipment, HVAC systems, and the like.

Informational Note No. 1: A typical construction may use a standard ISO shipping container or other structure as the outer enclosure, racks or cabinets of ITE, service-entrance equipment and power distribution components, power storage such as a UPS, and an air or liquid cooling system. Modular data centers are intended for fixed installation, either indoors or outdoors, based on their construction and resistance to environmental conditions. MDCs can be configured as an all-in-one system housed in a single equipment enclosure or as a system with the support equipment housed in separate equipment enclosures.

Informational Note No. 2: For information on listing requirements for both information technology equipment and communications equipment contained within a modular data center, see UL 60950-1-2014, *Information Technology Equipment — Safety — Part 1: General Requirements*, and UL 62368-1-2012, *Audio/Video, Information and Communication Technology Equipment — Part 1: Safety Requirements*.

Informational Note No. 3: *Modular data centers* as defined in this article are sometimes referred to as containerized data centers.

Informational Note No. 4: Equipment enclosures housing only support equipment (e.g., HVAC or power distribution equipment) that are not part of a specific modular data center are not considered a modular data center as defined in this article.

Statement of Problem and Substantiation for Public Comment

The proposed language is part of a global effort to provide guidance to the user of the code regarding applicability of definitions located in the .2 sections within individual articles. The language makes it clear that the definition is limited to Article 646. This is a followup to PI 1917, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that this definition already applies only within Article 646, therefore the additional language will explicitly share that information with the Code user.

Related Item

- PI 1917

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 30 19:46:31 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:

Resolution: [SR-7837-NFPA 70-2018](#)

Statement: The movement of "Information Technology Equipment Room" to Article 100 removes the connection to Article 645. The definition in this section applies only to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.

**Public Comment No. 119-NFPA 70-2018 [Section No. 646.3]****646.3 Other Articles.**

Circuits and equipment shall comply with 646.3(A) through (N) 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, 800.26, 805.26, and 820.26 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: 725.135(C) and Table 725.154
- (3) Fire alarm systems: 760.53(B)(2), 760.135(C) and Table 760.154
- (4) Optical fiber cables: 770.113(C) and Table 770.154(a)
- (5) Communications circuits: 805.113(C) and Table 805.154(a), ~~(b), and (c)~~
- (6) CATV and radio distribution systems: 820.113(C) and Table 820.154(a)

Informational Note: Environmentally controlled working spaces, aisles, and equipment areas in an MDC are not considered a plenum.

(C) Grounding.

Grounding and bonding of an MDC shall comply with Article 250. 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 725.121(A)(4) shall apply to the electrical classification of listed information technology equipment signaling circuits. Sections 725.139(D)(1) and 805.133(A)(1)(c) shall apply to the electrical classification of Class 2 and Class 3 circuits in the same cable with communications 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.

800.110, 800.113 and 800.154 shall apply to cable routing assemblies and communications raceways. Parts I, II, III, IV, and V of Article 805 shall apply to ~~cable routing assemblies,~~ communications wires, cables, ~~raceways,~~ and equipment installed in an MDC. Only communications wires and cables listed in accordance with 805.179, cable routing assemblies and communications raceways listed in accordance with ~~805.800.182,~~ and communications equipment listed in accordance with 805.170 shall be permitted to be installed in an MDC.

Informational Note: See Part I of 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 Article 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 820.179 and listed CATV equipment shall be permitted to be installed in an MDC.

(H) Storage Batteries.

Installation of storage batteries shall comply with Article 480.

Exception: Batteries that are part of listed and labeled equipment and installed in accordance with the listing requirements.

(I) Surge-Protective Devices (SPDs).

Where provided, surge-protective devices shall be listed and labeled and installed in accordance with Article 285.

(J) Lighting.

Lighting shall be installed in accordance with Article 410.

(K) Power Distribution Wiring and Wiring Protection.

Power distribution wiring and wiring protection within an MDC shall comply with Article 210 for branch circuits.

(L) Wiring Methods and Materials.

- (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 399)

- (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 III 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.

(M) Service Equipment.

For an MDC that is designed such that it may be powered from a separate electrical service, the service equipment for control and protection of services and their installation shall comply with Article 230. The service equipment and their arrangement and installation shall permit the installation of the service-entrance conductors in accordance with Article 230. Service equipment shall be listed and labeled and marked as being suitable for use as service equipment.

(N) 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 Comment

FR 7512 created a new general article, Article 800, for Chapter 8. The old Article 800 was renumbered to Article 805. PC 61 moves the requirements for cable routing assemblies and communications raceways from Article 805 (formerly 800) to the new Article 800.

Related Public Comments for This Document

<u>Related Comment</u>
<u>Public Comment No. 118-NFPA 70-2018 [Section No. 645.3]</u>
<u>Public Comment No. 118-NFPA 70-2018 [Section No. 645.3]</u>
<u>Public Comment No. 120-NFPA 70-2018 [Section No. 645.10(B)]</u>

Related Item

<u>Relationship</u>
Coordinating PC for Article 645

• FR7512

Submitter Information Verification

Submitter Full Name: Stanley Kaufman
Organization: CableSafe Inc
Affiliation: PLASTICS Industry Association
Street Address:
City:
State:
Zip:
Submittal Date: Sat Jun 30 15:26:28 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7826-NFPA 70-2018](#)
Statement: The panel action on PC 119 is intended to correlate with CMP 16 second revision actions to create a new general article, Article 800, in Chapter 8 and move common requirements from multiple locations in the chapter to Article 800.



Public Comment No. 184-NFPA 70-2018 [Section No. 646.19 [Excluding any Sub-Sections]]

For equipment over 1.8 m (6 ft) wide or deep, there shall be one entrance to and egress from the required working space not less than 610 mm (24 in.) wide and 2.0 m (6 ½ ft) high at each end of the working space. ~~The door(s) Doors~~ shall open in the direction of egress and be equipped with listed panic bars, ~~pressure plates, or other devices that are normally latched but open under simple pressure hardware or listed fire exit hardware~~ . A single entrance to and egress from the required working space shall be permitted where either of the conditions in 646.19(A) or (B) is met.

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of a task group appointed by the NEC Correlating Committee. The members of the Task Group are David Hittinger, John Kovacic, and Robert Osborne. The task group was appointed to identify areas in the Code® where “listed panic hardware” is required to expand the requirement to address both “listed panic hardware” and “listed fire exit hardware” as both types of hardware are evaluated to the Standard for Panic Hardware, UL 305, with “listed fire exit hardware” evaluated to both UL 305 AND the Standard for Positive Pressure Fire Tests of Door Assemblies, UL 10C. This action is taken to ensure consistency throughout the Code® where “panic hardware” is specified. Other changes to the verbiage may be included with the specific Public Comment, with the goal of establishing consistency with how these requirements are stated. Changes to Section 110.26(C)(3), as detailed in FR 8658, serve as the template for these revisions.

Related Item

- FR 8658

Submitter Information Verification

Submitter Full Name: Robert Osborne

Organization: UL LLC

Street Address:

City:

State:

Zip:

Submittal Date: Mon Jul 09 09:18:25 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7827-NFPA 70-2018](#)

Statement: The revised text responds affirmatively to a Correlating Committee comment intended to have consistent terminology throughout the code for panic hardware.

**Public Comment No. 1131-NFPA 70-2018 [Section No. 650.2]****650.2 Definitions.****Electronic Organ.**

A musical instrument that imitates the sound of a pipe organ by producing sound electronically.

Informational Note: Most new electronic organs produce sound digitally and are called digital organs.

Pipe Organ.

A musical instrument that produces sound by driving pressurized air (called wind) through pipes selected via a keyboard.

Sounding Apparatus.

The sound-producing part of a pipe organ, including, but not limited to, pipes, chimes, bells, the pressurized air (wind)-producing equipment (blower), associated controls, and power equipment.

Informational Note: The sounding apparatus is also referred to as the "pipe organ chamber."

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_180.pdf	70_CN180

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 180 in the First Draft Report on Public Input No. 1918.

The Correlating Committee directs the panel to take action on PI 1918 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Related Item

- Public Input No. 1918

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 23 14:33:28 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7828-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. All the definitions in this section shall apply to this article and throughout the code. "Pipe organ" was added to the definition for sounding apparatus to clarify the definition pertains to pipe organ sounding apparatus only.



Correlating Committee Note No. 180-NFPA 70-2018 [Section No. 650.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submission Date: Fri May 11 10:04:25 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1918 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 1950-NFPA 70-2018 [Section No. 650.2]

650.2 Definitions. The definitions in this section shall apply within this article and throughout the code.

Electronic Organ.

A musical instrument that imitates the sound of a pipe organ by producing sound electronically.

Informational Note: Most new electronic organs produce sound digitally and are called digital organs.

Pipe Organ.

A musical instrument that produces sound by driving pressurized air (called wind) through pipes selected via a keyboard.

Sounding Apparatus.

The sound-producing part of a pipe organ, including, but not limited to, pipes, chimes, bells, the pressurized air (wind)-producing equipment (blower), associated controls, and power equipment.

Informational Note: The sounding apparatus is also referred to as the "pipe organ chamber."

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1918, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was stated that these definitions apply only within Article 650; however, the term "pipe organ" is used in Articles 240, 250 and 640, and "electronic organs" is used in Article 640. It is clear from the context in those locations that the definitions found in Article 650 apply to the use of the terms in the other articles. The term "sounding apparatus" is not found anywhere in the code except Article 650, so there is no conflict elsewhere. Adding the proposed language clarifies for the code user that the definitions apply both in Article 650 and elsewhere in the code.

Related Item

- PI 1918

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 30 12:58:36 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7828-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. All the definitions in this section shall apply to this article and throughout the code. "Pipe organ" was added to the definition for sounding apparatus to clarify the definition pertains to pipe organ sounding apparatus only.

**Public Comment No. 1132-NFPA 70-2018 [Section No. 660.2]****660.2 Definitions.****Long-Time Rating.**

A rating based on an operating interval of 5 minutes or longer.

Mobile.

X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

Momentary Rating.

A rating based on an operating interval that does not exceed 5 seconds.

Portable.

X-ray equipment designed to be hand-carried.

Transportable.

X-ray equipment that is to be installed in a vehicle or that may be readily disassembled for transport in a vehicle.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_181.pdf	70_CN181

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 181 in the First Draft Report on Public Input No. 1958.

The Correlating Committee directs the panel to take action on PI 1958 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Related Item

- Public Input No. 1958

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 23 14:34:51 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7830-NFPA 70-2018

Statement:

This second revision places a new sentence on a line below the subject line. The definitions in this section apply to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 181-NFPA 70-2018 [Section No. 660.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submission Date: Fri May 11 10:05:07 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1958 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 1955-NFPA 70-2018 [Section No. 660.2]

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

Long-Time Rating.

A rating based on an operating interval of 5 minutes or longer.

Mobile.

X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

Momentary Rating.

A rating based on an operating interval that does not exceed 5 seconds.

Portable.

X-ray equipment designed to be hand-carried.

Transportable.

X-ray equipment that is to be installed in a vehicle or that may be readily disassembled for transport in a vehicle.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1958, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 660, therefore the additional language will explicitly share that information with the Code user. Use of the terms as defined in this Article in other locations in the Code would be inappropriate, therefore it is important to clearly indicate that their use is confined to the requirements in this Article.

Related Item

- PI 1958

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submission Date: Thu Aug 30 13:00:04 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7830-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply to this article.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.

**Public Comment No. 1133-NFPA 70-2018 [Section No. 665.2]****665.2 Definitions.****Applicator.**

The device used to transfer energy between the output circuit and the object or mass to be heated.

Converting Device.

That part of the heating equipment that converts input mechanical or electrical energy to the voltage, current, and frequency used for the heating applicator. A converting device consists of equipment using line frequency, all static multipliers, oscillator-type units using vacuum tubes, inverters using solid-state devices, or motor-generator equipment.

Dielectric Heating.

Heating of a nominally insulating material due to its own dielectric losses when the material is placed in a varying electric field.

Heating Equipment.

As used in this article, any equipment that is used for heating purposes and whose heat is generated by induction or dielectric methods.

Induction Heating, Melting, and Welding.

The heating, melting, or welding of a nominally conductive material due to its own I^2R losses when the material is placed in a varying electromagnetic field.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_183.pdf	70_CN183

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 183 in the First Draft Report on Public Input No. 1961.

The Correlating Committee directs the panel to take action on PI 1961 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Related Item

- Public Input No. 1961

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submission Date: Thu Aug 23 14:36:26 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:**Resolution:** [SR-7831-NFPA 70-2018](#)**Statement:** This second revision places a new sentence on a line below the subject line. The definitions in this section apply to this article.

The definition for heating equipment was revised to remove the reference for application in this article as the insertion of the new sentence below the subject line covers this intent.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 183-NFPA 70-2018 [Section No. 665.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submission Date: Fri May 11 10:06:54 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1961 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1956-NFPA 70-2018 [Section No. 665.2]**

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

Applicator.

The device used to transfer energy between the output circuit and the object or mass to be heated.

Converting Device.

That part of the heating equipment that converts input mechanical or electrical energy to the voltage, current, and frequency used for the heating applicator. A converting device consists of equipment using line frequency, all static multipliers, oscillator-type units using vacuum tubes, inverters using solid-state devices, or motor-generator equipment.

Dielectric Heating.

Heating of a nominally insulating material due to its own dielectric losses when the material is placed in a varying electric field.

Heating Equipment.

~~As used in this article, any~~ Any equipment that is used for heating purposes and whose heat is generated by induction or dielectric methods.

Induction Heating, Melting, and Welding.

The heating, melting, or welding of a nominally conductive material due to its own I^2R losses when the material is placed in a varying electromagnetic field.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1961, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 665, therefore the additional language will explicitly share that information with the Code user. Use of the terms as defined in this Article in other locations in the Code would be inappropriate, therefore it is important to clearly indicate that their use is confined to the requirements in this Article. With the addition of the proposed language, the phrase "As used in this article" in the definition for Heating Equipment is no longer necessary.

Related Item

- PI 1961

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 13:01:54 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7831-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply to this article.

The definition for heating equipment was revised to remove the reference for application in this article as the insertion of the new sentence below the subject line covers this intent.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.

**Public Comment No. 1134-NFPA 70-2018 [Section No. 668.2]****668.2 Definitions.****Cell Line.**

An assembly of electrically interconnected electrolytic cells supplied by a source of direct-current power.

Cell Line Attachments and Auxiliary Equipment.

As applied to this article, a term that includes, but is not limited to, auxiliary tanks; process piping; ductwork; structural supports; exposed cell line conductors; conduits and other raceways; pumps, positioning equipment, and cell cutout or bypass electrical devices. Auxiliary equipment includes tools, welding machines, crucibles, and other portable equipment used for operation and maintenance within the electrolytic cell line working zone.

In the cell line working zone, auxiliary equipment includes the exposed conductive surfaces of ungrounded cranes and crane-mounted cell-servicing equipment.

Electrically Connected.

A connection capable of carrying current as distinguished from connection through electromagnetic induction.

Electrolytic Cell.

A tank or vat in which electrochemical reactions are caused by applying electric energy for the purpose of refining or producing usable materials.

Electrolytic Cell Line Working Zone.

The space envelope wherein operation or maintenance is normally performed on or in the vicinity of exposed energized surfaces of electrolytic cell lines or their attachments.

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_184.pdf	70_CN184

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 184 in the First Draft Report on Public Input No. 1962.

The Correlating Committee directs the panel to take action on PI 1962 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Related Item

- Public Input No. 1962

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC

Organization: NEC Correlating Committee

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 23 14:37:58 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Rejected but see related SR

Action:

Resolution: SR-7832-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply to this article.

The definition for Cell Line Attachments and Auxiliary Equipment was revised to remove the reference for application in this article as the insertion of the new sentence below the subject line covers this intent.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 184-NFPA 70-2018 [Section No. 668.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submission Date: Fri May 11 10:13:11 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 1962 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.

**Public Comment No. 1957-NFPA 70-2018 [Section No. 668.2]**

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

Cell Line.

An assembly of electrically interconnected electrolytic cells supplied by a source of direct-current power.

Cell Line Attachments and Auxiliary Equipment.

~~As applied to this article, a~~ A term that includes, but is not limited to, auxiliary tanks; process piping; ductwork; structural supports; exposed cell line conductors; conduits and other raceways; pumps, positioning equipment, and cell cutout or bypass electrical devices. Auxiliary equipment includes tools, welding machines, crucibles, and other portable equipment used for operation and maintenance within the electrolytic cell line working zone.

In the cell line working zone, auxiliary equipment includes the exposed conductive surfaces of ungrounded cranes and crane-mounted cell-servicing equipment.

Electrically Connected.

A connection capable of carrying current as distinguished from connection through electromagnetic induction.

Electrolytic Cell.

A tank or vat in which electrochemical reactions are caused by applying electric energy for the purpose of refining or producing usable materials.

Electrolytic Cell Line Working Zone.

The space envelope wherein operation or maintenance is normally performed on or in the vicinity of exposed energized surfaces of electrolytic cell lines or their attachments.

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 1962, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. In the committee statement, it was acknowledged that these definitions already apply only within Article 668, therefore the additional language will explicitly share that information with the Code user. Use of the terms as defined in this Article in other locations in the Code would be inappropriate, therefore it is important to clearly indicate that their use is confined to the requirements in this Article. With the addition of the proposed language, it is unnecessary to use the phrase "As applied to this article" in the second definition.

Related Item

- PI 1962

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 13:03:36 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7832-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definitions in this section apply to this article.

The definition for Cell Line Attachments and Auxiliary Equipment was revised to remove the reference for application in this article as the insertion of the new sentence below the subject line covers this intent.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.

**Public Comment No. 1135-NFPA 70-2018 [Section No. 670.2]****670.2** Definition.**Industrial Machinery (Machine).**

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package. [The associated electrical equipment, including the logic controller(s) and associated software or logic together with the machine actuators and sensors, are considered as part of the industrial machine.]

Additional Proposed Changes

<u>File Name</u>	<u>Description Approved</u>
CN_185.pdf	70_CN185

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 185 in the First Draft Report on Public Input No. 2223.

The Correlating Committee directs the panel to take action on PI 2223 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Related Item

- Public Input No. 2223

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submission Date: Thu Aug 23 14:39:57 EDT 2018
Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR
Resolution: [SR-7833-NFPA 70-2018](#)
Statement: This second revision places a new sentence on a line below the subject line. The definition in this section shall apply to this article and throughout the code.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Correlating Committee Note No. 185-NFPA 70-2018 [Section No. 670.2]

Submitter Information Verification

Submitter Full Name: Sarah Caldwell

Committee:

Submission Date: Fri May 11 10:14:13 EDT 2018

Committee Statement and Meeting Notes

Committee Statement: The Correlating Committee directs the panel to take action on PI 2223 to correlate with other actions taken throughout the code with respect to the application of definitions in the XXX.2 sections. This action will be considered as a public comment.

Ballot Results

✓ **This item has passed ballot**

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.

Dressman, Kevin L.

Hickman, Palmer L.

Hittinger, David L.

Holub, Richard A.

Johnston, Michael J.

Kovacik, John R.

Manche, Alan

McDaniel, Roger D.

Pierce, James F.

Saporita, Vincent J.

Williams, David A.



Public Comment No. 1960-NFPA 70-2018 [Section No. 670.2]

670.2 Definition. The definition in this section shall apply within this article and throughout the code.

Industrial Machinery (Machine).

A power-driven machine (or a group of machines working together in a coordinated manner), not portable by hand while working, that is used to process material by cutting; forming; pressure; electrical, thermal, or optical techniques; lamination; or a combination of these processes. It can include associated equipment used to transfer material or tooling, including fixtures, to assemble/disassemble, to inspect or test, or to package. [The associated electrical equipment, including the logic controller(s) and associated software or logic together with the machine actuators and sensors, are considered as part of the industrial machine.]

Statement of Problem and Substantiation for Public Comment

This is a followup to PI 2232, which was submitted on behalf of a task group appointed by the NEC Correlating Committee. The additional language will explicitly inform the Code user that the definition applies both within the article and where used elsewhere in the code.

Related Item

- PI 2232

Submitter Information Verification

Submitter Full Name: Christel Hunter

Organization: Cerro Wire

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 13:05:33 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7833-NFPA 70-2018

Statement: This second revision places a new sentence on a line below the subject line. The definition in this section shall apply to this article and throughout the code.

The panel appeals to the correlating committee to put all definitions in Article 100 and assign code making panel responsibility to each definition.



Public Comment No. 1907-NFPA 70-2018 [Section No. 670.6]

670.6 Surge Protection.

Industrial machinery with safety interlock control devices not ~~effectively isolated~~ effectively protected from voltage surges on the incoming supply circuit shall have surge protection installed.

Informational Note: Examples of methods for effective protection from voltage surges include but are not limited to use of surge protection devices (SPDs) and use of power supplies incorporating surge protection to supply safety interlock control devices.

Statement of Problem and Substantiation for Public Comment

Substantiation: Use of the term “effectively protected” and the addition of the informational note clarifies the requirement.

Related Item

• PI2849 • FR8189

Submitter Information Verification

Submitter Full Name: Jay Tamblingson

Organization: Rockwell Automation

Street Address:

City:

State:

Zip:

Submittal Date: Thu Aug 30 11:51:04 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-7834-NFPA 70-2018

Statement: The language changed to clarify that circuits with effective surge protection do not have to add additional surge protection to meet the requirement. The informational note was not added as it was prescribing specific technologies and this section is purposefully left open to the type of technology deployed.



Public Comment No. 71-NFPA 70-2018 [New Part after VII.]

TITLE OF NEW CONTENT Edit title of Part VII

Type your content here ...

VII. Grounding and Bonding

Statement of Problem and Substantiation for Public Comment

Article 610 - Part VII

The changes we made to 610.61 (PI 8147) are technically accurate. But, I believe that we should have also changed the title of Part VII by adding "and Bonding" to match.

To read :

VII. Grounding and Bonding

Related Item

- 8147

Submitter Information Verification

Submitter Full Name: Scott Cline

Organization: McMurtrey Electric, Inc.

Street Address:

City:

State:

Zip:

Submittal Date: Wed Jun 27 19:21:29 EDT 2018

Committee: NEC-P12

Committee Statement

Committee Action: Rejected but see related SR

Resolution: [SR-7766-NFPA 70-2018](#)

Statement: The title of part VII was revised to include the words "and Bonding"