Public Comment No. 1026-NFPA 70-2021 [Global Input]

The Correlating Committee directs the Chair of CMP-15 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.

Additional Proposed Changes

File Name	Description	Approved
15_CN_364_Global.pdf	70_CN364	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 364 appeared in the First Draft Report on First Revision No. 8213.

The Correlating Committee directs the Chair of CMP-15 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.

Related Item

- First Revision No. 364

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 20:07:12 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 364-NFPA 70-2021 [Global Input]

Supplemental Information

File Name	Description	Approved
NEC_P15_Definitions_TG_Attachment_CN364.docx		

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Thu May 06 22:44:12 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Chair of CMP-15 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.

First Revision No. 8213-NFPA 70-2020 [Global Input]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Correlating Committee Definitions Task Group
CMP-15 - Definitions

CMP-15 Definitions	Correlating Committee Comments
	The Correlating Committee directs the Chair of CMP-15 to assign a task group to review all the definitions under their purview for compliance with the NEC Style Manual and to review definitions identified by the Correlating Committee that may contain correlation issues. The attachment includes a list of those definitions identified that need to be reviewed.
Alternating-Current Power Distribution Box (Alternating-Current Plugging Box, Scatter Box). **An** ac distribution center or box that contains one or more grounding-type polarized receptacles that can contain overcurrent protective devices. (530) (CMP-15)	Task Group 3 Appliances-Equipment-Portable Issues 2.2.2.3 Base Term 2.2.2.5 Alternate Term Power Distribution Box, AC (AC Power Distribution Box) (Scatter Box) Power Distribution Unit
Bundled. Cables or conductors that are tied, wrapped, taped, or otherwise periodically bound together. (520) (CMP-15)	Task Group 2 Cable Issues
Exposed Conductive Surfaces. Those surfaces that are capable of carrying electric current and that are unprotected, uninsulated, unenclosed, or unguarded, permitting personal contact. [99:3.3.54] (517) (CMP-15) Informational Note: Paint, anodizing, and similar coatings are not considered suitable insulation, unless they are listed for such use.	Task Group 11 Exposed Issues 2.2.2.4 Multiple Terms 3.1.3 In Interpretations
Grouped. Cables or conductors positioned adjacent to one another but not in continuous contact with each other. (520) (CMP-15)	Task Group 2 Cable Issues
Long-Time Rating (Standby Power). A rating based on an operating interval of 5 minutes or longer. (CMP-15)	Task Group 10 Long-Time & Momentary Rating 2.2.2.4 Multiple Terms
Momentary Rating (Maximum Power). A rating based on an operating interval that does not exceed 5 seconds. (CMP-15)	Task Group 10 Long-Time & Momentary Rating 2.2.2.4 Multiple Terms

Portable Equipment. Equipment intended to be moved from one place to another. (530) (CMP-15)	Task Group 3 Appliances-Equipment-Portable Issues 2.2.2.4 Multiple Terms
Portable Equipment. Equipment fed with portable cords or cables intended to be moved from one place to another. (520) (CMP-15)	Task Group 3 Appliances-Equipment-Portable Issues 2.2.2.4 Multiple Terms
Portable Power Distribution Unit. A power distribution box containing receptacles and overcurrent devices. (520) (CMP-15) Informational Note: See ANSI/UL 1640, Portable Power-Distribution Equipment, for information on portable power distribution units.	Task Group 3 Appliances-Equipment-Portable Issues
Portable Structures. Units designed to be moved including, but not limited to, amusement rides, attractions, concessions, tents, trailers, trucks, and similar units. (525) (CMP-15)	Task Group 3 Appliances-Equipment-Portable Issues
Fault Hazard Current. See Hazard Current.	2.2.2.5 Alternate Term Suggest Delete
Hazard Current. For a given set of connections in an isolated power system, the total current that would flow through a low impedance if it were connected between either isolated conductor and ground. [99:3.3.72] (517) (CMP-15)	2.2.2.3 Base Term Grouped by Hazard Current
Fault Hazard Current (as applied to hazard current). The hazard current of a given isolated power system with all devices connected except the line isolation monitor. [99:3.3.72.1] (517) (CMP-15)	2.2.2.3 Base Term Grouped by Hazard Current, Fault 2.2.2.3.1 Searchable Title Suggest: (Fault Hazard Current)
Monitor Hazard Current (as applied to hazard current). The hazard current of the line isolation monitor alone. [99:3.3.72.2] (517) (CMP-15)	2.2.2.3 Base Term Grouped by Hazard Current, Monitor 2.2.2.3.1 Searchable Title Suggest: (Monitor Hazard Current)
Total Hazard Current (as applied to hazard current). The hazard current of a given isolated system with all devices, including the line isolation monitor, connected. [99:3.3.72.3] (517) (CMP-15)	2.2.2.3 Base Term Grouped by Hazard Current, Total 2.2.2.3.1 Searchable Title Suggest: (Total Hazard Current)
Health Care Microgrid. A group of interconnected loads and distributed energy resources within clearly defined boundaries that acts as a single controllable entity with respect to the utility. [99:3.3.75] (517) (CMP-15)	2.2.2.3 Base Term Grouped by Microgrid, Health Care 2.2.2.3.1 Searchable Title Suggest: (Health Care Microgrid)

Motion Picture Studio (Lot). A building or group of buildings and other structures designed, constructed, or permanently altered for use by the entertainment industry for the purpose of motion picture or television production. (CMP-15)	2.2.2.5 Alternate Term?
Nonprofessional Projector. Those types of projectors that do not comply with the definition of Professional-Type Projector. (540) (CMP-15)	2.2.2.3 Base Term Group with Projector
Category 1 Space (as applied to patient care space). Space in which failure of equipment or a system is likely to cause major injury or death of patients, staff, or visitors. [99:3.3.140.1] (CMP-15) Informational Note: These spaces, formerly known as critical care rooms, are typically where patients are intended to be subjected to invasive procedures and connected to line-operated, patient care–related appliances. Examples include, but are not limited to, special care patient rooms used for critical care, intensive care, and special care treatment rooms such as angiography laboratories, cardiac catheterization laboratories, delivery rooms, operating rooms, post-anesthesia care units, trauma rooms, and other similar rooms. [99:A.3.3.140.1]	2.2.2.3. Base Term Patient Care Space, Category 1 (Category 1 Space)
Category 2 Space (as applied to patient care space). Space in which failure of equipment or a system is likely to cause minor injury to patients, staff, or visitors. [99:3.3.140.2] (CMP-15) Informational Note: These spaces were formerly known as general care rooms. Examples include, but are not limited to, inpatient bedrooms, dialysis rooms, in vitro fertilization rooms, procedural rooms, and similar rooms. [99:A.3.3.140.2]	2.2.2.3. Base Term Patient Care Space, Category 2 (Category 2 Space)
Category 3 Space (as applied to patient care space). Space in which the failure of equipment or a system is not likely to cause injury to patients, staff, or visitors but can cause discomfort. [99:3.3.140.3] (517) (CMP-15) Informational Note: These spaces, formerly known as basic care rooms, are typically where basic medical or dental care, treatment, or examinations are performed. Examples include, but are not limited to, examination or treatment rooms in clinics, medical and dental offices, nursing homes, and limited care facilities. [99:A.3.3.140.3]	2.2.2.3. Base Term Patient Care Space, Category 3 (Category 3 Space)
Category 4 Space (as applied to patient care space). Space in which failure of equipment or a system is not likely to have a physical impact on patient care. [99:3.3.140.4] (517) (CMP-15) Informational Note: These spaces were formerly known as support rooms. Examples of support spaces include, but are not limited to, anesthesia work rooms, sterile supply, laboratories, morgues, waiting rooms, utility rooms, and lounges. [99:A.3.3.140.4]	2.2.2.3. Base Term Patient Care Space, Category 4 (Category 4 Space)

Professional-Type Projector. A type of projector using 35- or 70-mm film that has a minimum width of 35 mm (13⁄8 in.) and has on each edge 212 perforations per meter (5.4 perforations per inch), or a type using carbon arc, xenon, or other light source equipment that develops hazardous gases, dust, or radiation. (540) (CMP-15)	2.2.2.3 Base Term Group by Projector 2.2.2.2 Requirement in Definition
Stage Switchboard, Portable. A portable rack or pack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone, used to feed stage equipment. (520) (CMP-15)	2.2.2.3.1 Searchable Title Suggest: (Portable Stage Switchboard)
Stand Lamp (Work Light). A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination on the stage or in the auditorium. (CMP-15)	2.2.2.4 Multiple Terms
Stand Lamp (Work Light). A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination in the studio or stage. (530) (CMP-15)	2.2.2.4 Multiple Terms
Television Studio or Motion Picture Stage (Sound Stage). A building or portion of a building usually insulated from outside noise and natural light for use by the entertainment industry for the purpose of motion picture, television, or commercial production. (530) (CMP-15)	2.2.2.3 Base Term. (determine) 2.2.2.5 Alternate Term

Public Comment No. 1723-NFPA 70-2021 [Definition: Alternate Power Source.]

Alternate Power Source.

One or more generator sets, ~~or battery systems where permitted,~~ and/or clean energy resources (photo voltaic systems, wind turbines, energy storage, biogas, geothermal and/or fuel cells) either configured individually or as a microgrid, intended to provide power during the interruption of the normal electrical service; or the public utility electrical service intended to provide power during interruption of service normally provided by the generating facilities on the premises. [**99:**3.3.4] (517) (CMP-15)

Statement of Problem and Substantiation for Public Comment

The recognition of clean energy resources as viable options to meet alternate power source requirements will help with the resilience, and sustainability of our built environment, and will help speed up the adoption of modern technologies into our industry.

Related Item

• Global FR-8683

Submitter Information Verification

Submitter Full Name: Jamie Schnick
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Affiliation: Facilities Development Division
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City:
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Submittal Date: Tue Aug 17 14:46:27 EDT 2021
Committee: NEC-P15

Public Comment No. 518-NFPA 70-2021 [Definition: Alternating-Current Power Distribution Box (Alt...]

~~**Alternating-Current Power Distribution Box (Alternating-Current Plugging Box) (Scatter Box).**~~

~~An ac distribution center or box that contains one or more grounding-type polarized receptacles that can contain overcurrent protective devices. (530) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This term was deleted by CMP-15 during the first draft and should not have been moved to Article 100

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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City:
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Submittal Date: Wed Jul 28 16:17:13 EDT 2021
Committee: NEC-P15

Public Comment No. 497-NFPA 70-2021 [Definition: Category 1 Space (as applied to patient care sp...]

Patient Care Space Category, Category 1 Space (~~as applied to patient care space~~ Category 1).

Space in which failure of equipment or a system is likely to cause major injury or death of patients, staff, or visitors. [**99:**3.3.140.1] (CMP-15)

Informational Note: These spaces, formerly known as critical care rooms, are typically where patients are intended to be subjected to invasive procedures and connected to line-operated, patient care–related appliances. Examples include, but are not limited to, special care patient rooms used for critical care, intensive care, and special care treatment rooms such as angiography laboratories, cardiac catheterization laboratories, delivery rooms, operating rooms, post-anesthesia care units, trauma rooms, and other similar rooms. [**99:**A.3.3.140.1]

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
Corrects the searchable term per MOS 2.2.2.3.1 and corrects the term to comply with 2.2.2.3 as a grouped term under the listing of "Patient Care Space Category".

This change is a bit unique. The term used in 517 is "...category 1...." so the searchable term would be "category 1" 517 doesn't use the term "patent care space" preceding each instance of the category listed.

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Submittal Date: Wed Jul 28 14:06:31 EDT 2021
Committee: NEC-P15

Public Comment No. 498-NFPA 70-2021 [Definition: Category 2 Space (as applied to patient care sp...]

Pateint Care Space Category, Category 2 Space (~~as applied to patient care space~~ Category 2).

Space in which failure of equipment or a system is likely to cause minor injury to patients, staff, or visitors. [**99:**3.3.140.2] (CMP-15)

Informational Note: These spaces were formerly known as general care rooms. Examples include, but are not limited to, inpatient bedrooms, dialysis rooms, in vitro fertilization rooms, procedural rooms, and similar rooms. [**99:**A.3.3.140.2]

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
Corrects the searchable term per MOS 2.2.2.3.1 and corrects the term to comply with 2.2.2.3 as a grouped term under the listing of "Patient Care Space Category".

This change is a bit unique. The term used in 517 is "...category 2...." so the searchable term would be "category 2" 517 doesn't use the term "patent care space" preceding each instance of the category listed.

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Submittal Date: Wed Jul 28 14:16:53 EDT 2021
Committee: NEC-P15

Public Comment No. 499-NFPA 70-2021 [Definition: Category 3 Space (as applied to patient care sp...]

Patient Care Space Category, Category 3 Space (~~as applied to patient care space~~ Category 3).

Space in which the failure of equipment or a system is not likely to cause injury to patients, staff, or visitors but can cause discomfort. [**99:**3.3.140.3] (517) (CMP-15)

Informational Note: These spaces, formerly known as basic care rooms, are typically where basic medical or dental care, treatment, or examinations are performed. Examples include, but are not limited to, examination or treatment rooms in clinics, medical and dental offices, nursing homes, and limited care facilities. [**99:**A.3.3.140.3]

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
Corrects the searchable term per MOS 2.2.2.3.1 and corrects the term to comply with 2.2.2.3 as a grouped term under the listing of "Patient Care Space Category".

This change is a bit unique. The term used in 517 is "...category 3...." so the searchable term would be "category 3" 517 doesn't use the term "patent care space" preceding each instance of the category listed.

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Submittal Date: Wed Jul 28 14:19:07 EDT 2021
Committee: NEC-P15

Public Comment No. 500-NFPA 70-2021 [Definition: Category 4 Space (as applied to patient care sp...]

Patient Care Space Category, Category 4 Space (~~as applied to patient care space~~ Category 4).

Space in which failure of equipment or a system is not likely to have a physical impact on patient care. [**99:**3.3.140.4] (517) (CMP-15)

Informational Note: These spaces were formerly known as support rooms. Examples of support spaces include, but are not limited to, anesthesia work rooms, sterile supply, laboratories, morgues, waiting rooms, utility rooms, and lounges. [**99:**A.3.3.140.4]

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
Corrects the searchable term per MOS 2.2.2.3.1 and corrects the term to comply with 2.2.2.3 as a grouped term under the listing of "Patient Care Space Category".

This change is a bit unique. The term used in 517 is "...category 4...." so the searchable term would be "category 4" 517 doesn't use the term "patent care space" preceding each instance of the category listed.

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Submittal Date: Wed Jul 28 14:20:13 EDT 2021
Committee: NEC-P15

Public Comment No. 489-NFPA 70-2021 [Definition: Fault Hazard Current (as applied to hazard curr...]

Hazard Current, Fault (Fault Hazard Current ~~(as applied to hazard current)~~ .

The hazard current of a given isolated power system with all devices connected except the line isolation monitor. [**99:**3.3.72.1] (517) (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

Corrects the searchable term per MOS 2.2.2.3.1. and corrects the term to comply with 2.2.2.3

Related Item

• PI-3013

Submitter Information Verification

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Submittal Date: Wed Jul 28 13:33:27 EDT 2021
Committee: NEC-P15

Public Comment No. 376-NFPA 70-2021 [Definition: Fault Hazard Current.]

~~**Fault Hazard Current.**~~

~~See *Hazard Current* .~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This definition is redundant and addressed under the base term of Hazard Current.

Related Item

• FR-8213

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: ASHE-AHA
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jul 26 12:33:58 EDT 2021
Committee: NEC-P15

Public Comment No. 1025-NFPA 70-2021 [Definition: Health Care Microgrid.]

Health Care Microgrid.

A group of interconnected loads and distributed energy resources within clearly defined boundaries that acts as a single controllable entity with respect to the utility. [**99:**3.3.75] (517) (CMP-15)

Additional Proposed Changes

File Name	Description	Approved
15_CN_306_Detail.pdf	70_CN306	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 306 appeared in the First Draft Report on First Revision No. 8062.

A task group is established consisting of members from CMPs 4, 13 and 15 to review all current and proposed definitions and requirements related for microgrids. General requirements that apply to all microgrid installations should be located within Article 705 for consistency and usability. CMP 13 should consider removing the definition of "DC Microgrid" and Article 712 based on the review of requirements in Article 705. CMP 15 should reconsider the use of the term and requirements for "Health Care Microgrids" in Article 517 and remove requirements which are redundant to those within Article 705.

Related Item

• First Revision No. 8062

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 20:05:12 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 306-NFPA 70-2021 [Detail]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Thu May 06 14:45:34 EDT 2021

Committee Statement

Committee Statement: A task group is established consisting of members from CMPs 4, 13 and 15 to review all current and proposed definitions and requirements related for microgrids. General requirements that apply to all microgrid installations should be located within Article 705 for consistency and usability. CMP 13 should consider removing the definition of “DC Microgrid” and Article 712 based on the review of requirements in Article 705. CMP 15 should reconsider the use of the term and requirements for “Health Care Microgrids” in Article 517 and remove requirements which are redundant to those within Article 705.

First Revision No. 8062-NFPA 70-2020 [Detail]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1469-NFPA 70-2021 [Definition: Health Care Microgrid.]

~~**Health Care Microgrid.**~~

~~A group of interconnected loads and distributed energy resources within clearly defined boundaries that acts as a single controllable entity with respect to the utility. [**99:** 3.3.75] (517) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

Term is deleted as redundant with the global defined term in 100 for microgrid. With the changes made in the related comments, the deleted term is no longer used in the mandatory text of this Code. The term “microgrid” remains defined in article 100 and the general requirements for microgrids remain in 705. NFPA-99 and NFPA-70 article 517 give additional constraints on the installation of microgrids to supply health care facilities.

This public comment is submitted on behalf of the task group formed under the direction of the Correlating Committee to review all current and proposed definitions and requirements related to microgrids to ensure a clear, consistent, and coordinated approach to addressing this topic throughout the Code.
The task group members are; Jason Fisher Chair, Brenton Michael Fedele, Ted Smith, Isaac Opalinsky, Pete Jackson, Jason Hopkins, John Kovacik, Steven Froemming, Krista Biason, Greg Ball, Chad Beebe, and Matthew Dozier. Through these individual's technical committee memberships, and their balanced interests, this task group provided the expertise to develop these public comments covering microgrids across the NEC.

This public comment is part of a series of actions recommended by the task group. See the related public comments which complete this action.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1467-NFPA 70-2021 [Section No. 517.30(B)]	Replacement of term in 517.30(B)
Public Comment No. 1468-NFPA 70-2021 [Section No. 517.30(C)(5)]	Replacement of term in 517.30(C)(5)
Public Comment No. 1467-NFPA 70-2021 [Section No. 517.30(B)]	
Public Comment No. 1468-NFPA 70-2021 [Section No. 517.30(C)(5)]	

Related Item

- FR-8062

Submitter Information Verification

Submitter Full Name: Jason Fisher
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Affiliation: CC Second Draft Microgrid Task Group
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City:
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Submittal Date: Fri Aug 13 17:47:55 EDT 2021
Committee: NEC-P15

Public Comment No. 1782-NFPA 70-2021 [Definition: Health Care Microgrid.]

Health Care Microgrid.

A group of interconnected loads and distributed energy resources within clearly defined boundaries that acts as a single controllable entity with respect to the ~~utility.~~ Normal Source and/or Essential Source for Health Care Facilities. At a minimum the Health Care Microgrid shall consist of (1) Distributed Energy Resources (DER's) and a Microgrid Controll System and includes the avility to disconnectfromthe primary source and operate in island mode. [**99:**3.3.75] (517) (CMP-15)

Statement of Problem and Substantiation for Public Comment

Clarification of what a healthcare microgrid is and introduction of the concept that if configured correctly, that a microgrid could be use as an Essential Source.

Related Item

• FR-8062, FR-9359, FR-9360 & Public Comment 1782

Submitter Information Verification

Submitter Full Name: Jamie Schnick
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Affiliation: Facilities Development Division
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Submittal Date: Tue Aug 17 18:39:12 EDT 2021
Committee: NEC-P15

Public Comment No. 493-NFPA 70-2021 [Definition: Health Care Microgrid.]

Microgrid, Health Care (Health Care Microgrid) .

A group of interconnected loads and distributed energy resources within clearly defined boundaries that acts as a single controllable entity with respect to the utility. [**99:**3.3.75] (517) (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
Corrects the searchable term per MOS 2.2.2.3.1. and corrects the term to comply with 2.2.2.3

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 13:53:07 EDT 2021
Committee: NEC-P15

Public Comment No. 506-NFPA 70-2021 [Definition: Location (Shooting Location).]

~~**Location (Shooting Location).**~~

~~A place outside a motion picture studio where a production or part of a production is filmed or recorded. (530) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This term is no longer used in article 530

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 14:39:56 EDT 2021
Committee: NEC-P15

Public Comment No. 507-NFPA 70-2021 [Definition: Location Board (Deuce Board).]

~~**Location Board (Deuce Board).**~~

~~Portable equipment containing a lighting contactor(s) and overcurrent protection designed for remote control of stage lighting. (530) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This term is no longer used in article 530

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 14:41:31 EDT 2021
Committee: NEC-P15

Public Comment No. 1272-NFPA 70-2021 [Definition: Long-Time Rating (Standby Power).]

~~**Long-Time Rating (Standby Power).**~~

~~A rating based on an operating interval of 5 minutes or longer. (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This term doesn't appear to be used in the context of standby power, unless something changed in the first draft. If that is the case, I apologize. See my related comment to the other "long-time" definition.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1271-NFPA 70-2021 [Definition: Long-Time Rating (as applied to nonmedical X-ra...]	

Related Item

- FR 8683

Submitter Information Verification

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City:
State:
Zip:
Submittal Date: Wed Aug 11 14:54:53 EDT 2021
Committee: NEC-P15

Public Comment No. 491-NFPA 70-2021 [Definition: Monitor Hazard Current (as applied to hazard cu...]

Hazard Current, Monitor (Monitor Hazard Current ~~(as applied to hazard current)~~.

The hazard current of the line isolation monitor alone. [**99:**3.3.72.2] (517) (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
Corrects the searchable term per MOS 2.2.2.3.1. and corrects the term to comply with 2.2.2.3

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: ASHE - AHA
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 13:44:57 EDT 2021
Committee: NEC-P15

Public Comment No. 494-NFPA 70-2021 [Definition: Motion Picture Studio (Lot).]

~~**Motion Picture Studio (Lot).**~~

~~A building or group of buildings and other structures designed, constructed, or permanently altered for use by the entertainment industry for the purpose of motion picture or television production. (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This is covered by the following two definitions:
Motion Picture and/or Television Studio. A building, group of buildings, other structures, and outdoor areas designed, constructed, permanently altered, designated, or approved for the purpose of motion picture or television production.
Motion Picture and/or Television Studio Sound Stage. A building or portion of a building, usually insulated from outside noise and natural light, designed, constructed, or altered for the purpose of image capture.

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
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Submittal Date: Wed Jul 28 13:55:22 EDT 2021
Committee: NEC-P15

Public Comment No. 495-NFPA 70-2021 [Definition: Nonprofessional Projector.]

Projector, Nonprofessional ~~Projector~~ .

Those types of projectors that do not comply with the definition of *Professional-Type Projector*. (540) (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

to be grouped under the term "Projector" will include professional-type and nonprofessional projectors

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
City:
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Submittal Date: Wed Jul 28 13:57:41 EDT 2021
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Public Comment No. 519-NFPA 70-2021 [Definition: Plugging Box.]

~~**Plugging Box.**~~

~~A dc device consisting of one or more 2-pole, 2-wire, nonpolarized, nongrounding-type receptacles intended to be used on dc circuits only. (530) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This term was deleted by CMP-15 during the first draft and should not have been moved to Article 100

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
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Committee: NEC-P15

Public Comment No. 496-NFPA 70-2021 [Definition: Professional-Type Projector.]

Projector, Professional-Type ~~Projector~~ .

A type of projector using 35- or 70-mm film that has a minimum width of 35 mm (1⅜ in.) and has on each edge 212 perforations per meter (5.4 perforations per inch), or a type using carbon arc, xenon, or other light source equipment that develops hazardous gases, dust, or radiation. (540) (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
To be grouped under the term "Projector" will include professional-type and nonprofessional projectors

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Submittal Date: Wed Jul 28 14:01:50 EDT 2021
Committee: NEC-P15

Public Comment No. 1418-NFPA 70-2021 [Definition: Ride Device.]

~~**Ride Device.**~~

~~A device or combination of devices that carry, convey, or direct a person(s) over or through a fixed or restricted course within a defined area for the primary purpose of amusement or entertainment. (522) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

A device is something that is used to control or carry electric energy. Anyone riding a device is taking the last ride of their life. Also, does a ride at an amusement attraction really need a definition? Is there anyone that goes to such a facility and does not know what a ride is?

Related Item

• FR 8213

Submitter Information Verification

Submitter Full Name: Ryan Jackson
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Submittal Date: Thu Aug 12 16:27:52 EDT 2021
Committee: NEC-P15

Public Comment No. 501-NFPA 70-2021 [Definition: Stage Switchboard, Portable.]

~~**Stage Switchboard, Portable.**~~

~~A portable rack or pack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone used to feed stage equipment. (520) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This PC isn't deleting this definition, under PC 521 it moves this definition to be grouped with the base term of Stage Switchboard to include both Fixed and Portable. See PC-521

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 521-NFPA 70-2021 [Definition: Stage Switchboard.]	
Public Comment No. 521-NFPA 70-2021 [Definition: Stage Switchboard.]	

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 14:24:46 EDT 2021
Committee: NEC-P15

Public Comment No. 521-NFPA 70-2021 [Definition: Stage Switchboard.]

Stage Switchboard, Fixed (Fixed Stage Switchboard) .

A permanently installed switchboard, panelboard, or rack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone, used primarily to feed stage equipment. (CMP-15)

Stage Switchboard, Portable (Portable Stage Swichboard).

A portable rack or pack contianing dimmers or relays with associated overcurrent protective devices, or overcurent protective devices alone used to feed stage equipment. (520) (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

The base term is Stage Switchboard - to comply with 2.2.2.3 the base term is used with modifier to follow. No new information is being added. Simply moving the existing definition of "Portable Stage Switchboard" to here.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 501-NFPA 70-2021 [Definition: Stage Switchboard, Portable.]	
Public Comment No. 501-NFPA 70-2021 [Definition: Stage Switchboard, Portable.]	

Related Item

- PI-3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 18:40:01 EDT 2021
Committee: NEC-P15

Public Comment No. 503-NFPA 70-2021 [Definition: Stand Lamp (Work Light).]

Stand Lamp (Work Light).

A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination on ~~the~~ a stage, in an auditorium or in ~~the auditorium~~ a studio . (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

There were two conflicting definitions for "Stand Lamp (Work Light)" that should be combined into a single definition.

Stand Lamp (Work Light). A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination on the stage or in the auditorium. (CMP-15)

Stand Lamp (Work Light). A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination in the studio or stage. (530) (CMP-15)

These were combined to include Studio, Stage and Auditorium.

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
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State:
Zip:
Submittal Date: Wed Jul 28 14:29:11 EDT 2021
Committee: NEC-P15

Public Comment No. 505-NFPA 70-2021 [Definition: Television Studio or Motion Picture Stage (Soun...]

~~**Television Studio or Motion Picture Stage (Sound Stage).**~~

~~A building or portion of a building usually insulated from the outside noise and natural light for use by the entertainment industry for the purpose of motion picture, television, or commercial production. (530) (CMP-15)~~

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This should be deleted. It is covered by these two art 530 definitions:
Motion Picture and/or Television Studio. A building, group of buildings, other structures, and outdoor areas designed, constructed, permanently altered, designated, or approved for the purpose of motion picture or television production.
Motion Picture and/or Television Studio Sound Stage. A building or portion of a building, usually insulated from outside noise and natural light, designed, constructed, or altered for the purpose of image capture.

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
City:
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Submittal Date: Wed Jul 28 14:34:32 EDT 2021
Committee: NEC-P15

Public Comment No. 492-NFPA 70-2021 [Definition: Total Hazard Current (as applied to hazard curr...]

Hazard Current, Total (Total Hazard Current ~~(as applied to hazard current~~).

The hazard current of a given isolated system with all devices, including the line isolation monitor, connected. [**99:**3.3.72.3] (517) (CMP-15)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
Corrects the searchable term per MOS 2.2.2.3.1. and corrects the term to comply with 2.2.2.3

Related Item

• PI-3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
City:
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Submittal Date: Wed Jul 28 13:49:31 EDT 2021
Committee: NEC-P15

Public Comment No. 508-NFPA 70-2021 [New Definition after Definition: DC-to-DC Converter Circuit.]

DC Plugging Box. **A dc device consisting of one or more 2-pole, 2-wire, nonpolarized, non-grounding type receptacles intended to be used on dc circuits only.**

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This definition should have been moved over with the transition to Article 100

Related Item

• PI 3013 •

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
City:
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Submittal Date: Wed Jul 28 14:46:13 EDT 2021
Committee: NEC-P15

Public Comment No. 509-NFPA 70-2021 [New Definition after Definition: Motion Picture Studio (Lot...]

Motion Picture and/or Television Studio. _ **A building, group of buildings, other structures, and outdoor areas designed, constructed, permanently altered, designated, or approved for the purpose of motion picture or television production.**

Motion Picture and/or Television Studio Sound Stage. _ **A building or portion of a building, usually insulated from outside noise and natural light, designed, constructed, or altered for the purpose of image capture.**

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

These definitions didn't get transferred over to Article 100

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jul 28 14:48:32 EDT 2021
Committee: NEC-P15

Public Comment No. 510-NFPA 70-2021 [New Definition after Definition: Portable Structures.]

Portable Substation. **A portable assembly, usually mounted on a trailer, containing primary and secondary switchgear, and a transformer.**

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This definition wasn't transferred over to Article 100

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
Street Address:
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Submittal Date: Wed Jul 28 14:51:03 EDT 2021
Committee: NEC-P15

Public Comment No. 511-NFPA 70-2021 [New Definition after Definition: Process Seal.]

__ . **Production Areas.** . **Areas where portable electrical equipment covered by this article is used to implement the capture of images.**

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.

This definition was not transfered to article 100

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
Organization: Ashe - Aha
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Submittal Date: Wed Jul 28 14:53:25 EDT 2021
Committee: NEC-P15

Public Comment No. 512-NFPA 70-2021 [New Definition after Definition: Purged and Pressurized.]

Purpose-Built. **A custom luminaire, piece of lighting equipment, or effect that is constructed for a specific purpose and is not serially manufactured or available for general sale.**

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
This definition was not transfered to article 100

Related Item

- PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
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Submittal Date: Wed Jul 28 14:55:38 EDT 2021
Committee: NEC-P15

Public Comment No. 513-NFPA 70-2021 [New Definition after Definition: Remote Disconnect Control.]

Remote Location. **A location, other than a motion picture or television studio, where a production is filmed or recorded.**

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
This definition was not transfered to article 100

Related Item

- PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
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Zip:
Submittal Date: Wed Jul 28 14:57:15 EDT 2021
Committee: NEC-P15

Public Comment No. 517-NFPA 70-2021 [New Definition after Definition: Supervisory Control and Da...]

Support . Areas. . Areas, other than fixed production offices, intended to support production and where the capture of the image will not take place. Such areas include, but are not limited to, mobile production office, storage, and workspaces; vehicles and trailers for cast, makeup, hair, lighting, grip, wardrobe, props, catering, craft services; and portable restrooms. (530)

Statement of Problem and Substantiation for Public Comment

This change is being submitted from the CMP-15 Definitions Task Group.
This definition was not transferred to article 100

Related Item

• PI 3013

Submitter Information Verification

Submitter Full Name: Chad Beebe
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Street Address:
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Committee: NEC-P15

Public Comment No. 239-NFPA 70-2021 [Article 517]

Article 517 Health Care Facilities

Part I. General

517.1 Scope.

This article applies to electrical construction and installation criteria in health care facilities that provide services to human beings.

The requirements in Parts II and III not only apply to single-function buildings but are also intended to be individually applied to their respective forms of occupancy within a multifunction building (e.g., a doctor's examining room located within a limited care facility would be required to meet 517.10).

Informational Note No. 1 : For information concerning performance, maintenance, and testing criteria, refer to the appropriate health care facilities documents.

Informational Note No. 2: Text that is followed by a reference in brackets has been extracted from NFPA 99-2021, *Health Care Facilities Code*, or NFPA *101*-2021, *Life Safety Code*. Only editorial changes were made to the extracted text to make it consistent with this *Code*.

517.4 General Installation — Construction Criteria.

The requirements of this article shall specify the installation criteria and wiring methods that minimize electrical hazards by the maintenance of adequately low potential differences only between exposed conductive surfaces that are likely to become energized and could be contacted by a patient.

Informational Note: In a health care facility, it is difficult to prevent the occurrence of a conductive or capacitive path from the patient's body to some grounded object, because that path might be established accidentally or through instrumentation directly connected to the patient. Other electrically conductive surfaces that might make an additional contact with the patient, or instruments that might be connected to the patient, then become possible sources of electric currents that can traverse the patient's body. The hazard is increased as more apparatus is associated with the patient, therefore more intensive precautions are needed. Control of electric shock hazard requires the limitation of electric current that might flow in an electrical circuit involving the patient's body by raising the resistance of the conductive circuit that includes the patient, or by insulating exposed surfaces that might become energized, in addition to reducing the potential difference that can appear between exposed conductive surfaces in the patient care vicinity, or by combinations of these methods. A special problem is presented by the patient with an externalized direct conductive path to the heart muscle. The patient could be electrocuted at current levels so low that additional protection in the design of appliances, insulation of the catheter, and control of medical practice is required.

517.6 Patient Care–Related Electrical Equipment.

The reconditioning requirements of this *Code* shall not apply to patient care–related electrical equipment.

Informational Note No. 1: Patient care–related electrical equipment is differentiated from electrical equipment as described in 110.21(A)(2).

Informational Note No. 2: If patient care–related electrical equipment is relocated, it is expected to be recommissioned or recertified in accordance with the U.S. *Federal Food, Drug, and Cosmetic Act (FDCA)*.

Part II. Wiring and Protection

517.10 Applicability.

(A) Applicability.

Part II shall apply to patient care space of all health care facilities.

(B) Not Covered.

Part II shall not apply to the following:

(1) Business offices, corridors, waiting rooms, and the like in clinics, medical and dental offices, and outpatient facilities

(2) Spaces of nursing homes and limited care facilities wired in accordance with Chapters 1 through 4 of this Code where these spaces are used exclusively as patient sleeping rooms

Informational Note No. 1: See 406.12(5) for receptacles located in health care facility business offices, corridors, and waiting rooms that are required to be tamper resistant.

Informational Note No. 2: See 210.12(D) for branch circuits supplying outlets and receptacles located in patient sleeping rooms in nursing homes and limited care facilities that are connected to arc-fault circuit-interrupter circuits.

(3) Areas used exclusively for any of the following purposes:

(4) Intramuscular injections (immunizations)

(5) Psychiatry and psychotherapy

(6) Alternative medicine

(7) Optometry

(8) Pharmacy services not contiguous to health care facilities

Informational Note No. 3: See NFPA *101*-2021, *Life Safety Code*.

517.12 Wiring Methods.

Except as modified in this article, wiring methods shall comply with Chapters 1 through 4 of this *Code*.

517.13 Equipment Grounding Conductor for Receptacles and Fixed Electrical Equipment in Patient Care Spaces.

Wiring serving patient care spaces shall comply with the requirements of 517.13(A) and (B).

Exception: Luminaires more than 2.3 m (7½ ft) above the floor and switches located outside of the patient care vicinity shall be permitted to be connected to an equipment grounding return path complying with the requirements of 517.13(A) or (B).

(A) Wiring Methods.

All branch circuits serving patient care spaces shall be provided with an effective ground-fault current path by installation in a metal raceway system or a cable having a metallic armor or sheath assembly. The metal raceway system, metallic cable armor, or sheath assembly shall itself qualify as an equipment grounding conductor in accordance with 250.118.

(B) Insulated Equipment Grounding Conductors and Insulated Equipment Bonding Jumpers.

(1) General.

An insulated copper equipment grounding conductor that is clearly identified along its entire length by green insulation and installed with the branch circuit conductors within the wiring method in accordance with 517.13(A) shall be directly connected to the following:

(1) Grounding terminals of all receptacles other than isolated ground receptacles

(2) Metal outlet boxes, metal device boxes, or metal enclosures

(3) Non–current-carrying conductive surfaces of fixed electrical equipment likely to become energized that are subject to personal contact, operating at over 100 volts

Exception No. 1: For other than isolated ground receptacles, an insulated equipment bonding jumper that directly connects to the equipment grounding conductor shall be permitted to connect the box and receptacle(s) to the equipment grounding conductor. Isolated ground receptacles shall be connected in accordance with 517.16.

Exception No. 2: Metal faceplates shall be connected to an effective ground-fault current path by means of a metal mounting screw(s) securing the faceplate to a metal yoke or strap of a receptacle or to a metal outlet box.

(2) Sizing.

Equipment grounding conductors and equipment bonding jumpers shall be sized in accordance with 250.122.

517.14 Panelboard Bonding.

The equipment grounding terminal buses of the normal and essential branch-circuit panelboards serving the same individual patient care vicinity shall be connected together with an insulated continuous copper conductor not smaller than 10 AWG. Where two or more panelboards serving the same individual patient care vicinity are served from separate transfer switches on the essential electrical system, the equipment grounding terminal buses of those panelboards shall be connected together with an insulated continuous copper conductor not smaller than 10 AWG. This conductor shall be permitted to be broken in order to terminate on the equipment grounding terminal bus in each panelboard.

Exception: The insulated continuous copper conductor not smaller than 10 AWG shall be permitted to be terminated on listed connections to aluminum or copper busbars not smaller than 6 mm thick × 50 mm wide (¼ in. thick × 2 in. wide) and of sufficient length to accommodate the number of terminations necessary for the bonding of the panelboards. The busbar shall be securely fastened and installed in an accessible location.

517.16 Use of Isolated Ground Receptacles.

An isolated ground receptacle, if used, shall not defeat the purposes of the safety features of the grounding systems detailed in 517.13. [**99:**6.3.2.2.5(A)]

(A) Inside of a Patient Care Vicinity.

An isolated ground receptacle shall not be installed within a patient care vicinity. [**99:**6.3.2.2.5(B)]

(B) Outside of a Patient Care Vicinity.

Isolated ground receptacle(s) installed in patient care spaces outside of a patient care vicinity(s) shall comply with 517.16(B)(1) and (B)(2).

(1)

The equipment grounding terminals of isolated ground receptacles installed in branch circuits for patient care spaces shall be connected to an insulated equipment grounding conductor in accordance with 250.146(D) installed in a wiring method described in 517.13(A).

The equipment grounding conductor connected to the equipment grounding terminals of isolated ground receptacles in patient care spaces shall be clearly identified along the equipment grounding conductor's entire length by green insulation with one or more yellow stripes.

(2)

The insulated equipment grounding conductor required in 517.13(B)(1) shall be clearly identified along its entire length by green insulation, with no yellow stripes, and shall not be connected to the grounding terminals of isolated equipment ground receptacles but shall be connected to the box or enclosure indicated in 517.13(B)(1)(2) and to non–current-carrying conductive surfaces of fixed electrical equipment indicated in 517.13(B)(1)(3).

Informational Note No. 1: This type of installation is typically used where a reduction of electrical noise (electromagnetic interference) is necessary, and parallel grounding paths are to be avoided.

Informational Note No. 2: Care should be taken in specifying a system containing isolated ground receptacles, because the impedance of the effective ground-fault current path is dependent upon the equipment grounding conductor(s) and does not benefit from any conduit or building structure in parallel with the equipment grounding conductor.

517.~~17~~ 21 Ground-Fault Protection of Equipment.

(A) Applicability.

The requirements of 517.17 shall apply to buildings or portions of buildings containing health care facilities with Category 1 spaces or utilizing electrical life-support equipment, and buildings that provide the required essential utilities or services for the operation of Category 1 spaces or electrical life-support equipment.

(B) Feeders.

Where ground-fault protection of equipment is provided for operation of the service disconnecting means or feeder disconnecting means as specified by 230.95 or 215.10, an additional step of ground-fault protection shall be provided in all next level feeder disconnecting means downstream toward the load. Such protection shall consist of overcurrent devices and current transformers or other protective equipment that shall cause the feeder disconnecting means to open.

The additional levels of ground-fault protection of equipment shall not be installed on the load side of an essential electrical system transfer switch.

(C) Selectivity.

Ground-fault protection of equipment for operation of the service and feeder disconnecting means shall be fully selective such that the feeder device, but not the service device, shall open on ground faults on the load side of the feeder device. Separation of ground-fault protection time-current characteristics shall conform to manufacturer’s recommendations and shall consider all required tolerances and disconnect operating time to achieve 100 percent selectivity.

Informational Note: See 230.95, Informational Note, for transfer of alternate source where ground-fault protection is applied.

(D) Testing.

When ground-fault protection of equipment is first installed, each level shall be performance tested to ensure compliance with 517.17(C). This testing shall be conducted by a qualified person(s) using a test process in accordance with the instruction provided with the equipment. A written record of this testing shall be made and shall be available to the authority having jurisdiction.

517.~~18~~ 24 Category 2 Spaces.

(A) Patient Bed Location.

Each patient bed location shall be supplied by at least two branch circuits, one from the critical branch and one from the normal system. All branch circuits from the normal system shall originate in the same panelboard. The electrical receptacles or the cover plate for the electrical receptacles supplied from the critical branch shall have a distinctive color or marking so as to be readily identifiable and shall also indicate the panelboard and branch-circuit number supplying them.

Branch circuits serving patient bed locations shall not be part of a multiwire branch circuit.

Exception No. 1: Branch circuits serving only special-purpose outlets or receptacles, such as portable X-ray outlets, shall not be required to be served from the same distribution panel or panels.

Exception No. 2: The requirements of 517.18(A) shall not apply to patient bed locations in clinics, medical and dental offices, and outpatient facilities; psychiatric, substance abuse, and rehabilitation hospitals; sleeping rooms of nursing homes; and limited care facilities meeting the requirements of 517.10(B)(2).

Exception No. 3: A Category 2 patient bed location served from two separate transfer switches on the critical branch shall not be required to have circuits from the normal system.

Exception No. 4: Circuits served by Type 2 essential electrical systems shall be permitted to be fed by the equipment branch of the essential electrical system.

(B) Patient Bed Location Receptacles.

(1) Minimum Number and Supply.

Each patient bed location shall be provided with a minimum of eight receptacles.

(2) Receptacle Requirements.

The receptacles required in 517.18(B)(1) shall be permitted to be of the single, duplex, or quadruplex type or any combination of the three. All receptacles shall be listed "hospital grade" and shall be so identified. The grounding terminal of each receptacle shall be connected to an insulated copper equipment grounding conductor sized in accordance with Table 250.122.

Exception No. 1: The requirements of 517.18(B)(1) and (B)(2) shall not apply to psychiatric, substance abuse, and rehabilitation hospitals meeting the requirements of 517.10(B)(2).

Exception No. 2: Psychiatric security rooms shall not be required to have receptacle outlets installed in the room.

Informational Note: It is not intended that there be a total, immediate replacement of existing non–hospital grade receptacles. It is intended, however, that non–hospital grade receptacles be replaced with hospital grade receptacles upon modification of use, renovation, or as existing receptacles need replacement.

(C) Designated Category 2 Pediatric Locations.

Receptacles that are located within patient rooms, bathrooms, playrooms, and activity rooms of pediatric units or spaces with similar risk as determined by the health care facility's governing body by conducting a risk assessment, other than infant nurseries, shall be listed and identified as "tamper resistant" or shall employ a listed tamper-resistant cover. [**99:**6.3.2.2.1(D)]

517.~~19~~ 25 Category 1 Spaces.

(A) Patient Bed Location Branch Circuits.

Each patient bed location shall be supplied by at least two branch circuits, one or more from the critical branch and one or more from the normal system. At least one branch circuit from the critical branch shall supply an outlet(s) only at that bed location.

The electrical receptacles or the cover plates for the electrical receptacles supplied from the life safety and critical branches shall have a distinctive color or marking so as to be readily identifiable. [**99:**6.7.2.2.5(B)]

All branch circuits from the normal system shall be from a single panelboard. Critical branch receptacles shall be identified and shall also indicate the panelboard and circuit number supplying them.

Branch circuits serving patient bed locations shall not be part of a multiwire branch circuit.

Exception No. 1: Branch circuits serving only special-purpose receptacles or equipment in Category 1 spaces shall be permitted to be served by other panelboards.

Exception No. 2: Category 1 spaces served from two separate critical branch transfer switches shall not be required to have circuits from the normal system.

(B) Patient Bed Location Receptacles.

(1) Minimum Number and Supply.

Each patient bed location shall be provided with a minimum of 14 receptacles, with at least one connected to either of the following:

(1) The normal system branch circuit required in 517.19(A)

(2) A critical branch circuit supplied by a different transfer switch than the other receptacles at the same patient bed location

(2) Receptacle Requirements.

The receptacles required in 517.19(B)(1) shall be permitted to be of the single, duplex, or quadruplex type or any combination of the three. All receptacles shall be listed "hospital grade" and shall be so identified. The grounding terminal of each receptacle shall be connected to the reference grounding point by means of an insulated copper equipment grounding conductor.

(C) Operating Room Receptacles.

(1) Minimum Number and Supply.

Each operating room shall be provided with a minimum of 36 receptacles divided between at least two branch circuits. At least 12 receptacles, but no more than 24, shall be connected to either of the following:

(1) The normal system branch circuit required in 517.19(A)

(2) A critical branch circuit supplied by a different transfer switch than the other receptacles at the same location

(2) Receptacle Requirements.

The receptacles shall be permitted to be of the locking or nonlocking type and of the single, duplex, or quadruplex types or any combination of the three.

All nonlocking-type receptacles shall be listed hospital grade and so identified. The grounding terminal of each receptacle shall be connected to the reference grounding point by means of an insulated copper equipment grounding conductor.

(D) Patient Care Vicinity Grounding and Bonding (Optional).

A patient care vicinity shall be permitted to have a patient equipment grounding point. The patient equipment grounding point, where supplied, shall be permitted to contain one or more listed grounding and bonding jacks. An equipment bonding jumper not smaller than 10 AWG shall be used to connect the grounding terminal of all grounding-type receptacles to the patient equipment grounding point. The bonding conductor shall be permitted to be arranged centrically or looped as convenient.

Informational Note: Where there is no patient equipment grounding point, it is important that the distance between the reference grounding point and the patient care vicinity be as short as possible to minimize any potential differences.

(E) Equipment Grounding and Bonding.

Where a grounded electrical distribution system is used and metal feeder raceway or Type MC or MI cable that qualifies as an equipment grounding conductor in accordance with 250.118 is installed, grounding of enclosures and equipment, such as panelboards, switchboards, and switchgear, shall be ensured by one of the following bonding means at each termination or junction point of the metal raceway or Type MC or MI cable:

(1) A grounding bushing and a continuous copper bonding jumper, sized in accordance with 250.122, with the bonding jumper connected to the junction enclosure or the ground bus of the panel

(2) Connection of feeder raceways or Type MC or MI cable to threaded hubs or bosses on terminating enclosures

(3) Other approved devices such as bonding-type locknuts or bushings. Standard locknuts shall not be used for bonding.

(F) Additional Protective Techniques in Category 1 Spaces (Optional).

Isolated power systems shall be permitted to be used for Category 1 spaces, and, if used, the isolated power system equipment shall be listed as isolated power equipment. The isolated power system shall be designed and installed in accordance with 517.160.

Exception: The audible and visual indicators of the line isolation monitor shall be permitted to be located at the nursing station for the area being served.

(G) Isolated Power System Equipment Grounding.

Where an isolated ungrounded power source is used and limits the first-fault current to a low magnitude, the equipment grounding conductor associated with the secondary circuit shall be permitted to be run outside of the enclosure of the power conductors in the same circuit.

Informational Note: Although it is permitted to run the equipment grounding conductor outside of the conduit, it is safer to run it with the power conductors to provide better protection in case of a second ground fault.

(H) Special-Purpose Receptacle Grounding.

The equipment grounding conductor for special-purpose receptacles, such as the operation of mobile X-ray equipment, shall be extended to the reference grounding points of branch circuits for all locations likely to be served from such receptacles. Where such a circuit is served from an isolated ungrounded system, the equipment grounding conductor shall not be required to be run with the power conductors; however, the equipment grounding terminal of the special-purpose receptacle shall be connected to the reference grounding point.

517.~~20~~ 29 Wet Procedure Locations.

(A) Receptacles and Fixed Equipment.

Wet procedure locations shall be provided with special protection against electric shock. [**99:**6.3.2.3.1]

This special protection shall be provided as follows:

(1) Isolated power systems that remain in operation in the event of a single line-to-ground fault condition that inherently limits the possible ground-fault current due to a first fault to a low value, without interrupting the power supply.

Informational Note No. 1: Isolated power systems can eliminate the danger of electric shock to patients who might be more susceptible to leakage current and unable to move in their beds.

(2) Power distribution system in which the power supply is interrupted if the ground-fault current does, in fact, exceed the trip value of a Class A GFCI.

Informational Note No. 2: See ANSI/UL 943-2018, *Ground-Fault Circuit-Interrupters*, Annex E, and, in accordance with 110.3(B), the manufacturers' installation instructions of listed ground-fault circuit interrupters for information on the supply connection of life-support equipment to circuits providing ground-fault circuit-interrupter (GFCI) protection of personnel at outlets.

[**99:**6.3.2.3.2]

Exception: Branch circuits supplying only listed, fixed, therapeutic, and diagnostic equipment shall be permitted to be supplied from a grounded service, single- or 3-phase system if the following conditions are met:

(1) Wiring for grounded and isolated circuits does not occupy the same raceway.

(2) All conductive surfaces of the equipment are connected to an insulated copper equipment grounding conductor.

(B) Isolated Power Systems.

Where an isolated power system is utilized, the isolated power equipment shall be listed as isolated power equipment, and the isolated power system shall be designed and installed in accordance with 517.160.

Informational Note: See Part IV of Article 680 for requirements on the installation of therapeutic pools and tubs.

517.~~21~~ 30 Ground-Fault Circuit-Interrupter Protection for Personnel in Category 2 and Category 1 Spaces.

Receptacles shall not be required in bathrooms or toilet rooms. [**99:**6.3.2.2.2(D)]

Receptacles located in patient bathrooms and toilet rooms in Category 2 spaces shall have ground-fault circuit-interrupter protection in accordance with 210.8(B)(1).

Ground-fault circuit-interrupter protection for personnel shall not be required for receptacles installed in those Category 2 and Category 1 spaces where a basin, sink, or other similar plumbing fixture is installed in the patient bed location.

Informational Note: See ANSI/UL 943-2018, *Ground-Fault Circuit-Interrupters*, Annex E, and, in accordance with 110.3(B), the manufacturers' installation instructions of listed ground-fault circuit interrupters for information on the supply connection of life-support equipment to circuits providing ground-fault circuit-interrupter (GFCI) protection of personnel at outlets.

517.~~22~~ 35 Demand Factors.

Demand factors for general-use receptacles and individual branch circuits not exceeding 150 volts to ground shall be permitted to be applied in accordance with 517.22(A) and (B).

(A) General-Use Receptacles.

In addition to demand factors allowed by other sections of this *Code*, the demand factor for general-use receptacles shall be permitted to be calculated in accordance with Table 517.22(A).

Table 517.22(A) Demand Factors for General-Use Receptacles in Health Care Facilities

Portion of Receptacle Load to Which Demand Factor Applies	Demand Factor (%)
First 5.0 kVA or less	100
Second 5.0 kVA to 10kVA	50
Remainder over 10 kVA	25

Informational Note: See 220.14(I) for the calculation of general-use receptacle loads.

(B) Receptacles for Designated Equipment.

Individual branch circuits supplying receptacles for equipment shall be permitted to be calculated in accordance with Table 517.22(B).

Table 517.22(B) Demand Factors for Equipment Supplied by Individual Branch Circuits in Health Care Facilities

Equipment Supplied by Individual Branch Circuits	Demand Factor (%)
Largest five connected loads	100
Six or more connected loads	50

Informational Note: See 220.60 for noncoincident load calculations.

Part III. Essential Electrical System (EES)

517.~~25~~ 40 Essential Electrical Systems for Health Care Facilities.

Type 1 and Type 2 essential electrical systems (EES) for health care facilities shall comprise separate branches capable of supplying a limited amount of lighting and power service, which is considered essential for life safety and orderly cessation of procedures during the time normal electrical service is interrupted for any reason.

Informational Note: SeeNFPA 99-2021, *Health Care Facilities Code*, for information on the need for an essential electrical system.

517.~~26~~ 42 Application of Other Articles.

The life safety branch of the essential electrical system shall meet the requirements of Article 700, except as amended as follows:

(1) Section 700.4 shall not apply.

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

(3) Section 700.17 shall be replaced with the following: Branch circuits that supply emergency lighting shall be installed to provide service from a source in accordance with 700.12 when normal supply for lighting is interrupted or where single circuits supply luminaires containing secondary batteries.

(4) Section 700.32 shall not apply.

Informational Note No. 1: See NFPA 110-2019, *Standard for Emergency and Standby Power Systems*, for additional information.

Informational Note No. 2: See 517.29 and NFPA 99-2021, *Health Care Facilities Code*, for additional information.

517.~~29~~ 43 Type 1 Essential Electrical Systems.

Informational Note: Type 1 essential electrical systems are comprised of three separate branches capable of supplying a limited amount of lighting and power service that is considered essential for life safety and effective facility operation during the time the normal electrical service is interrupted for any reason. These three separate branches are the life safety, critical, and equipment branches. [**99:**A.6.7.2.3]

(A) Applicability.

The requirements of 517.29 through 517.35 shall apply to Type 1 essential electrical systems. Type 1 systems shall be required for Category 1 spaces. Type 1 systems shall be permitted to serve Category 2, Category 3, and Category 4 spaces.

Informational Note No. 1: See NFPA 99-2021, *Health Care Facilities Code*, for performance, maintenance, and testing requirements of essential electrical systems in hospitals. See NFPA 20-2019, *Standard for the Installation of Stationary Pumps for Fire Protection*, for installation of centrifugal fire pumps.

Informational Note No. 2: See NFPA 99-2021, *Health Care Facilities Code*, 6.7.5 and 6.7.6, for additional information on Type 1 and Type 2 essential electrical systems.

(B) Type 1 Essential Electrical Systems.

Category 1 spaces shall be served by a Type 1 essential electrical system. [**99:**6.4.1]

Category 1 spaces shall not be served by a Type 2 EES. [**99:**6.4.2]

517.~~30~~ 45 Sources of Power.

(A) Two Independent Power Sources.

Essential electrical systems shall have a minimum of the following two independent sources of power: a normal source generally supplying the entire electrical system and one or more alternate sources for use when the normal source is interrupted. [**99:**6.7.1.1.2]

(B) Types of Normal Power Sources.

Normal power sources shall be permitted to be any of the following:

(1) Utility supply power

(2) Generation units

(3) Health care microgrid

(4) Fuel cells

(C) Types of Alternate Power Sources.

Alternate power sources shall be permitted to be any of those specified in 517.30(C)(1) through (C)(5).

(1) Utility Supply Power.

Where utility power is used as the normal source, utility power shall not be permitted to be used as the alternate source unless permitted elsewhere in this article.

Informational Note: See 517.35 and 517.45 for essential system loads that can be supplied from dual sources of utility supply power.

(2) Generating Units.

Where the normal source of power consists of generating units on the premises, the alternate source shall be either another generating set or an external utility service. [**99:**6.7.1.1.3]

(3) Fuel Cell Systems.

Fuel cell systems shall be permitted to serve as the alternate power source for all or part of an essential electrical system. [**99:**6.7.1.5.1]

(a) Installation of fuel cells shall comply with the requirements in Parts I through VII of Article 692 for 1000 volts or less and Part VIII for over 1000 volts.

(b) N + 1 units shall be provided where N units have sufficient capacity to supply the demand load of the portion of the system served.

(c) Systems shall be able to assume loads within 10 seconds of loss of normal power source.

(d) Systems shall have a continuing source of fuel supply, together with sufficient on-site fuel storage for the essential system type.

(e) Where life safety and critical portions of the distribution system are present, a connection shall be provided for a portable diesel generator.

Informational Note: See NFPA 853-2020, *Standard for the Installation of Stationary Fuel Cell Power Systems*, for information on installation of stationary fuel cells.

(4) Energy Storage Systems.

Energy storage systems shall be permitted to serve as the alternate source for all or part of an essential electrical system.

Informational Note: See NFPA 111-2019, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, for information on the installation of energy storage systems.

(5) Health Care Microgrid.

(a) If health care microgrid power is used as the normal source, health care microgrid power shall not be permitted to be used as the alternate source.

(b) Essential electrical systems shall be permitted to be supplied by a health care microgrid that also supplies nonessential loads. The health care microgrid shall be permitted to share distributed resources with the normal system. Health care microgrid systems shall be designed with sufficient reliability to provide effective facility operation consistent with the facility emergency operations plan. Health care microgrid system components shall not be compromised by failure of the normal source.

Informational Note: See NFPA 99-2021, *Health Care Facilities Code, for information on health care microgrids*.

(D) Location of Essential Electrical System Components.

Essential electrical system components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [**99:**6.2.4.1]

(1) Services.

Installation of electrical service distribution equipment shall be located to reduce possible interruption of normal electrical services resulting from natural or manmade causes as well as internal wiring and equipment failures.

(2) Feeders.

Feeders shall be located to provide physical separation of the feeders of the alternate source and from the feeders of the normal electrical source to prevent possible simultaneous interruption. [**99:**6.2.4.3]

Informational Note: Facilities in which the normal source of power is supplied by two or more separate central station-fed services experience greater than normal electrical service reliability than those with only a single feed. Such a dual source of normal power consists of two or more electrical services fed from separate generator sets or a utility distribution network that has multiple power input sources and is arranged to provide mechanical and electrical separation so that a fault between the facility and the generating sources is not likely to cause an interruption of more than one of the facility service feeders.

517.~~31~~ 46 Requirements for the Essential Electrical System.

(A) Separate Branches.

Type 1 essential electrical systems shall be comprised of three separate branches capable of supplying a limited amount of lighting and power service that is considered essential for life safety and effective hospital operation during the time the normal electrical service is interrupted for any reason. The three branches are life safety, critical, and equipment.

The division between the branches shall occur at transfer switches where more than one transfer switch is required. [**99:**6.7.2.3.1]

(B) Transfer Switches.

Transfer switches shall be in accordance with one of the following:

(1) The number of transfer switches to be used shall be based on reliability and design. Each branch of the essential electrical system shall have one or more transfer switches.

(2) One transfer switch shall be permitted to serve one or more branches in a facility with a continuous load on the switch of 150 kVA (120 kW) or less. [**99:**6.7.6.2.1.4]

Informational Note No. 1: See NFPA 99-2021, *Health Care Facilities Code*, 6.7.3.1, 6.7.2.2.5, 6.7.2.2.5.15, and 6.7.2.2.7, for more information on transfer switches.

Informational Note No. 2: See Informational Note Figure 517.31(B)(a).

Informational Note No. 3: See Informational Note Figure 517.31(B)(b).

Figure Informational Note Figure 517.31(B)(a) Type 1 Essential Electrical System — Minimum Requirement (Greater Than 150 kVA) for Transfer Switch Arrangement.

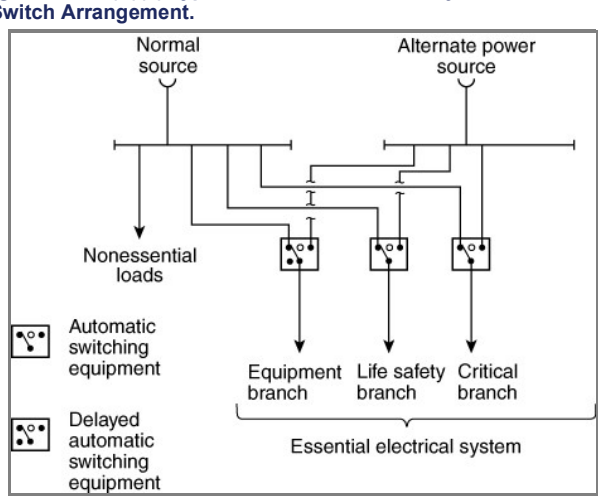
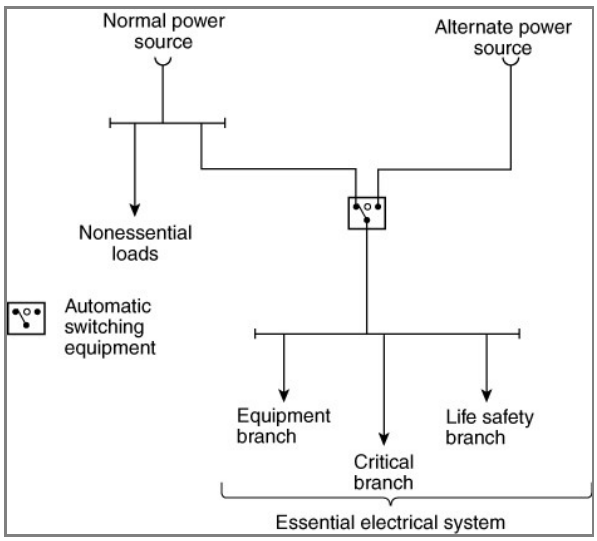


Figure Informational Note Figure 517.31(B)(b) Type 1 Essential Electrical System — Minimum Requirement (150 kVA or Less) for Transfer Switch Arrangement.



(1) Optional Loads.

Loads served by the generating equipment not specifically named in this article shall be served by their own transfer switches such that the following conditions apply:

(1) These loads shall not be transferred if the transfer will overload the generating equipment.

(2) These loads shall be automatically shed upon generating equipment overloading.

(2) Contiguous Facilities.

Hospital power sources and alternate power sources shall be permitted to serve the essential electrical systems of contiguous or same-site facilities.

(C) Wiring Requirements.

(1) Separation from Other Circuits.

The life safety branch and critical branch [of the essential electrical system] shall be kept independent of all other wiring and equipment. [**99:**6.7.5.2.1]

(a) Raceways, cables, or enclosures of the life safety and critical branch shall be readily identified as components of the essential electrical system (EES). Boxes and enclosures (including transfer switches, generators, and power panels) shall be field- or factory-marked and identified as components of the EES. Raceways and cables shall be field- or factory-marked as components of the EES at intervals not to exceed 7.6 m (25 ft).

(b) Conductors of the life safety branch or critical branch shall not enter the same raceways, boxes, or cabinets with each other or any other wiring system. Branch conductors shall be permitted to occupy common equipment, raceways, boxes, or cabinets of other circuits not part of the life safety branch and critical branch where such wiring complies with one of the following:

(3) Is in transfer equipment enclosures

(4) Is in exit or emergency luminaires supplied from two sources

(5) Is in a common junction box attached to exit or emergency luminaires supplied from two sources

(6) Is for two or more circuits supplied from the same branch and same transfer switch

(g) The wiring of the equipment branch shall be permitted to occupy the same raceways, boxes, or cabinets of other circuits that are not part of the essential electrical system.

(h) Where Category 2 locations are served from two separate transfer switches on the essential electrical system in accordance with 517.18(A), Exception No. 3, the Category 2 circuits from the two separate systems shall be kept independent of each other.

(i) Where Category 1 locations are served from two separate transfer switches on the essential electrical system in accordance with 517.19(A), Exception No. 2, the critical care circuits from the two separate systems shall be kept independent of each other.

(2) Isolated Power Systems.

Where isolated power systems are installed in any of the areas in 517.34(A)(1) and (A)(2), each system shall be supplied by an individual circuit serving no other load.

(3) Mechanical Protection of the Essential Electrical System.

The wiring of the life safety and critical branches shall be mechanically protected by raceways. Where installed as branch circuits in patient care spaces, the installation shall comply with the requirements of 517.13(A) and (B) and 250.118. Only the following wiring methods shall be permitted:

(1) Nonflexible metal raceways, Type MI cable, Type RTRC marked with the suffix –XW, or Schedule 80 PVC conduit. Nonmetallic raceways shall not be used for branch circuits that supply patient care spaces.

(2) Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 PVC conduit, flexible nonmetallic or jacketed metallic raceways, or jacketed metallic cable assemblies listed for installation in concrete. Nonmetallic raceways shall not be used for branch circuits that supply patient care spaces.

(3) Listed flexible metal raceways and listed metal sheathed cable assemblies, as follows:

(4) Where used in listed prefabricated medical headwalls

(5) In listed office furnishings

(6) Where fished into existing walls or ceilings, not otherwise accessible and not subject to physical damage

(7) Where necessary for flexible connection to equipment

(8) For equipment that requires a flexible connection due to movement, vibration, or operation

(9) Luminaires installed in ceiling structures

(10) Flexible power cords of appliances or other utilization equipment connected to the essential electrical system.

(11) Cables for Class 2 or Class 3 systems permitted in Part VI of this article, with or without raceways.

Informational Note: See 517.13 for additional grounding requirements in patient care areas.

(D) Capacity of Systems.

The essential electrical system shall have the capacity and rating to meet the maximum actual demand likely to be produced by the connected load.

Feeders shall be sized in accordance with 215.2 and Part III of Article 220. The alternate power source(s) required in 517.30 shall have the capacity and rating to meet the demand produced by the load at any given time.

Demand calculations for sizing of the alternate power source(s) shall be based on any of the following:

(1) Prudent demand factors and historical data

(2) Connected load

(3) Feeder calculations

(4) Any combination of the above

The sizing requirements in 700.4 and 701.4 shall not apply to alternate sources.

(E) Receptacle Identification.

The electrical receptacles or the cover plates for the electrical receptacles supplied from the life safety and critical branches shall have a distinctive color or marking so as to be readily identifiable. [**99:**6.7.2.2.5(B)]

(F) Feeders from Alternate Power Source.

A single feeder supplied by a local or remote alternate power source shall be permitted to supply the essential electrical system to the point at which the life safety, critical, and equipment branches are separated. Installation of the transfer equipment shall be permitted at other than the location of the alternate power source.

(G) Coordination.

Overcurrent protective devices serving the essential electrical system shall be coordinated for the period of time that a fault's duration extends beyond 0.1 second.

Exception No. 1: Coordination shall not be required between transformer primary and secondary overcurrent protective devices where only one overcurrent protective device or set of overcurrent protective devices exists on the transformer secondary.

Exception No. 2: Coordination shall not be required between overcurrent protective devices of the same size (ampere rating) in series.

Informational Note No. 1: The terms *coordination* and *coordinated* as used in this section do not cover the full range of overcurrent conditions.

Informational Note No. 2: See 517.17(C) for information on requirements for the coordination of ground-fault protection.

517.~~32~~ 47 Branches Requiring Automatic Connection.

(A) Life Safety and Critical Branch Used in a Type 1 EES.

Those functions of patient care depending on lighting or appliances that are connected to the essential electrical system shall be divided into the life safety branch and the critical branch, as described in 517.33 and 517.34.

(B) Life Safety and Critical Branch Used in a Type 2 EES.

The life safety and critical branches shall be installed and connected to the alternate power source specified in 517.41(A) and 517.41(B) so that all functions specified herein for the life safety and critical branches are automatically restored to operation within 10 seconds after interruption of the normal source. [**99:**6.7.5.3.1]

517.~~33~~ 50 Life Safety Branch.

The life safety branch shall be limited to circuits essential to life safety. [**99:**6.7.5.1.2.3]

No functions other than those listed in 517.33(A) through (H) shall be connected to the life safety branch. The life safety branch shall supply power as follows:

(A) Illumination of Means of Egress.

Illumination of means of egress such as lighting required for corridors, passageways, stairways, and landings at exit doors, and all necessary ways of approach to exits. Switching arrangements to transfer patient corridor lighting in hospitals from general illumination circuits to night illumination circuits shall be permitted, if only one of two circuits can be selected and both circuits cannot be extinguished at the same time.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Sections 7.8 and 7.9.

(B) Exit Signs.

Exit signs and exit directional signs.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Section 7.10.

(C) Alarm and Alerting Systems.

Alarm and alerting systems including the following:

(1) Fire alarm systems

(2) Alarm and alerting systems (other than fire alarm systems) shall be connected to the life safety branch or critical branch. [**99:**6.7.5.1.2.5]

(3) Alarms for systems used for the piping of nonflammable medical gases

(4) Mechanical, control, and other accessories required for effective life safety systems operation shall be permitted to be connected to the life safety branch.

(D) Communications Systems.

Hospital communications systems, where used for issuing instructions during emergency conditions. [**99:**6.7.5.1.2.4(3)]

(E) Generator Set Locations.

Generator set locations as follows:

(1) Task illumination

(2) Battery charger for emergency battery-powered lighting unit(s)

(3) Select receptacles at the generator set location and essential electrical system transfer switch locations

[**99:**6.7.5.1.2.4(4)]

(F) Generator Set Accessories.

Loads dedicated to a specific generator, including the fuel transfer pump(s), ventilation fans, electrically operated louvers, controls, cooling system, and other generator accessories essential for generator operation, shall be connected to the life safety branch or to the output terminals of the generator with overcurrent protective devices. [**99:**6.7.5.1.2.6]

(G) Elevators.

Elevator cab lighting, control, communications, and signal systems. [**99:**6.7.5.1.2.4(5)]

(H) Automatic Doors.

Electrically powered doors used for building egress. [**99:**6.7.5.1.2.4(6)]

517.~~34~~ 51 Critical Branch.

(A) Task Illumination, Fixed Equipment, and Selected Receptacles.

The critical branch shall supply power for task illumination, fixed equipment, select receptacles, and select power circuits serving the following spaces and functions related to patient care:

(1) Category 1 spaces where deep sedation or general anesthesia is administered, task illumination, select receptacles, and fixed equipment

(2) Task illumination and select receptacles in the following:

(3) Patient care spaces, including infant nurseries, selected acute nursing areas, psychiatric bed areas (omit receptacles), and ward treatment rooms

(4) Medication preparation spaces

(5) Pharmacy dispensing spaces

(6) Nurses' stations — unless adequately lighted by corridor luminaires

(7) Additional specialized patient care task illumination and receptacles, where needed

(8) Nurse call systems

(9) Blood, bone, and tissue banks

(10) Telecommunications entrance facility, telecommunications equipment rooms, and telecommunication rooms and equipment in these rooms

(11) Task illumination, select receptacles, and select power circuits for the following areas:

(12) Category 1 or 2 spaces with at least one duplex receptacle per patient bed location, and task illumination as required by the governing body of the health care facility

(13) Angiographic labs

(14) Cardiac catheterization labs

(15) Coronary care units

(16) Hemodialysis rooms or areas

(17) Emergency room treatment areas (select)

(18) Human physiology labs

(19) Intensive care units

(20) Postoperative recovery rooms (select)

(21) Clinical IT-network equipment

(22) Wireless phone and paging equipment for clinical staff communications

(23) Additional task illumination, receptacles, and select power circuits needed for effective facility operation, including single-phase fractional horsepower motors, which are permitted to be connected to the critical branch

[**99:**6.7.5.1.3.2]

(B) Switching.

It shall be permitted to control task illumination on the critical branch.

(C) Subdivision of the Critical Branch.

The critical branch shall be permitted to be subdivided into two or more branches. [**99:**6.7.5.1.3.1]

Informational Note: It is important to analyze the consequences of supplying an area with only critical branch power when failure occurs between the area and the transfer switch. Some proportion of normal and critical power or critical power from separate transfer switches might be appropriate.

517.~~35~~ 52 Equipment Branch Connection to Alternate Power Source.

The equipment branch shall be installed and connected to the alternate power source such that the equipment described in 517.35(A) is automatically restored to operation at appropriate time-lag intervals following the energizing of the life safety and critical branches. [**99:**6.7.5.1.4.2(A)]

The arrangement of the connection to the alternate power source shall also provide for the subsequent connection of equipment described in 517.35(B). [**99:**6.7.5.1.4.2(B)]

Exception: For essential electrical systems under 150 kVA, deletion of the time-lag intervals feature for delayed automatic connection to the equipment system shall be permitted.

(A) Equipment for Delayed Automatic Connection.

The following equipment shall be permitted to be arranged for delayed automatic connection to the alternate power source:

(1) Central suction systems serving medical and surgical functions, including controls, with such suction systems permitted to be placed on the critical branch

(2) Sump pumps and other equipment required to operate for the safety of major apparatus, including associated control systems and alarms

(3) Compressed air systems serving medical and surgical functions, including controls with such air systems permitted to be placed on the critical branch

(4) Smoke control and stair pressurization systems

(5) Kitchen hood supply or exhaust systems, or both, if required to operate during a fire in or under the hood

(6) Supply, return, and exhaust ventilating systems for the following:

(7) Airborne infectious/isolation rooms

(8) Protective environment rooms

(9) Exhaust fans for laboratory fume hoods

(10) Nuclear medicine areas where radioactive material is used

(11) Ethylene oxide evacuation

(12) Anesthetic evacuation

[99:6.7.5.1.4.3(A)]

Where delayed automatic connection is not appropriate, the ventilation systems specified in 517.35(A)(6) shall be permitted to be placed on the critical branch. [**99:**6.7.5.1.4.3(B)]

(13) Supply, return, and exhaust ventilating systems for operating and delivery rooms

(14) Supply, return, exhaust ventilating systems and/or air-conditioning systems serving telephone equipment rooms and closets and data equipment rooms and closets

Exception: Sequential delayed automatic connection to the alternate power source to prevent overloading the generator shall be permitted where engineering studies indicate it is necessary.

(B) Equipment for Delayed Automatic or Manual Connection.

The following equipment shall be permitted to be arranged for either delayed automatic or manual connection to the alternate power source:

(1) Heating equipment to provide heating for operating, delivery, labor, recovery, intensive care, coronary care, nurseries, infection/isolation rooms, emergency treatment spaces, and general patient rooms and pressure maintenance (jockey or make-up) pump(s) for water-based fire protection systems

Exception: Heating of general patient rooms and infection/isolation rooms during disruption of the normal source shall not be required under any of the following conditions:

(1) The outside design temperature is higher than −6.7°C (20°F).

(2) The outside design temperature is lower than −6.7°C (20°F), and where a selected room(s) is provided for the needs of all confined patients, only such room(s) need be heated.

(3) The facility is served by a dual source of normal power.

Informational Note No. 1: The design temperature is based on the 97.5 percent design value as shown in Chapter 24 of the ASHRAE *Handbook of Fundamentals* (2013).

Informational Note No. 2: For a description of a dual source of normal power, see 517.30(D).

(2) An elevator(s) selected to provide service to patient, surgical, obstetrical, and ground floors during interruption of normal power. In instances where interruption of normal power would result in other elevators stopping between floors, throw-over facilities shall be provided to allow the temporary operation of any elevator for the release of patients or other persons who may be confined between floors.

(3) Hyperbaric facilities.

(4) Hypobaric facilities.

(5) Automatically operated doors.

(6) Minimal electrically heated autoclaving equipment shall be permitted to be arranged for either automatic or manual connection to the alternate source.

(7) Controls for equipment listed in 517.35.

(8) Other selected equipment shall be permitted to be served by the equipment system. [**99:**6.7.5.1.4.4]

517.~~40~~ 60 Type 2 Essential Electrical Systems.

Informational Note No. 1: Nursing homes and other limited care facilities can contain Category 1 and/or Category 2 patient care spaces, depending on the design and type of care administered in the facility. For Category 1 spaces, see 517.29 through 517.35. For Category 2 spaces not served by Type 1 essential electrical systems, see 517.40 through 517.44 .

Informational Note No. 2: Type 2 essential electrical systems are comprised of two separate branches capable of supplying a limited amount of lighting and power service that is considered essential for the protection of life and safety and effective operation of the institution during the time normal electrical service is interrupted for any reason. These two separate branches are the life safety and equipment branches. The number of transfer switches to be used should be based upon reliability, design, and load considerations. Each branch of the essential electrical system should have one or more transfer switches. One transfer switch should be permitted to serve one or more branches in a facility with a maximum demand on the essential electrical system of 150 kVA (120 kW). [**99:**A.6.7.6.2.1]

(A) Applicability.

The requirements of 517.40(C) through 517.44 shall apply to Category 2 spaces.

Exception: The requirements of 517.40(C) through 517.44 shall not apply to freestanding buildings used as nursing homes and limited care facilities if the following apply:

(1) Admitting and discharge policies are maintained that preclude the provision of care for any patient or resident who might need to be sustained by electrical life-support equipment.

(2) No surgical treatment requiring general anesthesia is offered.

(3) An automatic battery-operated system(s) or equipment shall be effective for at least 1½ hours and is otherwise in accordance with 700.12 and that shall be capable of supplying lighting for exit lights, exit corridors, stairways, nursing stations, medical preparation areas, boiler rooms, and communications areas. This system shall also supply power to operate all alarm systems.

Informational Note: See NFPA *101*-2021, *Life Safety Code*.

(B) Category 1 Spaces in Inpatient Hospital Care Facilities.

For those nursing homes and limited care facilities that admit patients who need to be sustained by electrical life-support equipment, the essential electrical system from the source to the portion of the facility where such patients are treated shall comply with the requirements of 517.29 through 517.35.

(C) Facilities Contiguous or Located on the Same Site with Hospitals.

Nursing homes and limited care facilities that are contiguous or located on the same site with a hospital shall be permitted to have their essential electrical systems supplied by the hospital.

517.~~41~~ 61 Required Power Sources.

(A) Two Independent Power Sources.

Essential electrical systems shall have a minimum of the following two independent sources of power: a normal source generally supplying the entire electrical system and one or more alternate sources for use when the normal source is interrupted. [**99:**6.7.1.2.2]

(B) Types of Power Sources.

Where the normal source consists of generating units on the premises, the alternate power source shall be either another generating set or an external utility service. [**99:**6.7.1.1.3]

(C) Location of Essential Electrical System Components.

Essential electrical system components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [**99:**6.2.4.1]

Installations of electrical services shall be located to reduce possible interruption of normal electrical services resulting from similar causes as well as possible disruption of normal electrical service due to internal wiring and equipment failures. [**99:**6.2.4.2]

Feeders shall be located to provide physical separation of the feeders of the alternate source and from the feeders of the normal electrical source to prevent possible simultaneous interruption. [**99:**6.2.4.3]

517.~~42~~ 62 Essential Electrical Systems for Nursing Homes and Limited Care Facilities.

(A) General.

The [Type 2] essential electrical system shall be divided into the following two branches:

(1) Life safety branch

(2) Equipment branch

[**99:**6.7.6.2.1.2]

The division between the branches shall occur at transfer switches where more than one transfer switch is required. [**99:**6.7.2.2.1]

Informational Note No. 1: Type 2 essential electrical systems are comprised of two separate branches capable of supplying a limited amount of lighting and power service that is considered essential for the protection of life and safety and effective operation of the institution during the time normal electrical service is interrupted for any reason. These two separate branches are the life safety and equipment branches. [**99:**A.6.7.6.2.1]

Informational Note No. 2: The number of transfer switches to be used should be based upon reliability, design, and load considerations. Each branch of the essential electrical system should have one or more transfer switches. One transfer switch should be permitted to serve one or more branches in a facility with a maximum demand on the essential electrical system of 150 kVA (120 kW). [**99:**A.6.7.6.2.1]

Informational Note No. 3: For more information, see NFPA 99-2021, *Health Care Facilities Code*, 6.7.2.3.

(B) Transfer Switches.

The number of transfer switches to be used shall be based upon reliability, design, and load considerations. [**99:**6.7.2.2.3]

Transfer switches shall be in accordance with one of the following:

(1) Each branch of the essential electrical system shall have one or more transfer switches. [**99:**6.7.2.2.3.1]

(2) One transfer switch shall be permitted to serve one or more branches in a facility with a continuous load on the switch of 150 kVA (120 kW) or less. [**99:**6.7.2.2.3.2]

Informational Note No. 1: See NFPA 99-2021, *Health Care Facilities Code*, 6.7.2.2.4, 6.7.2.2.5, 6.7.2.2.5.15, and 6.7.2.2.7 for more information on transfer switches.

Informational Note No. 2: See Informational Note Figure 517.42(B)(a).

Informational Note No. 3: See Informational Note Figure 517.42(B)(b).

Figure Informational Note Figure 517.42(B)(a) Type 2 Essential Electrical Systems (Nursing Home and Limited Health Care Facilities) — Minimum Requirement (Greater Than 150 kVA) for Transfer Switch Arrangement.

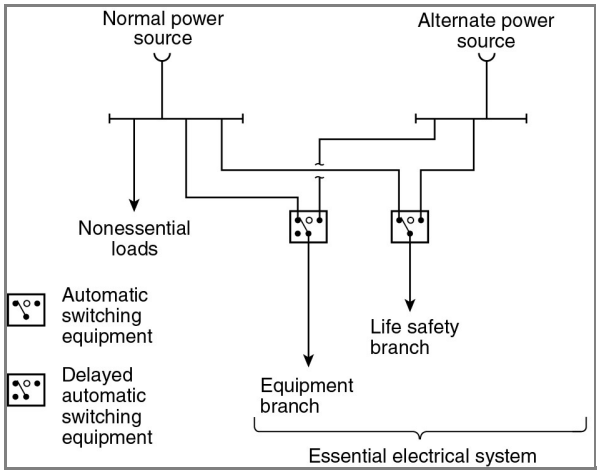
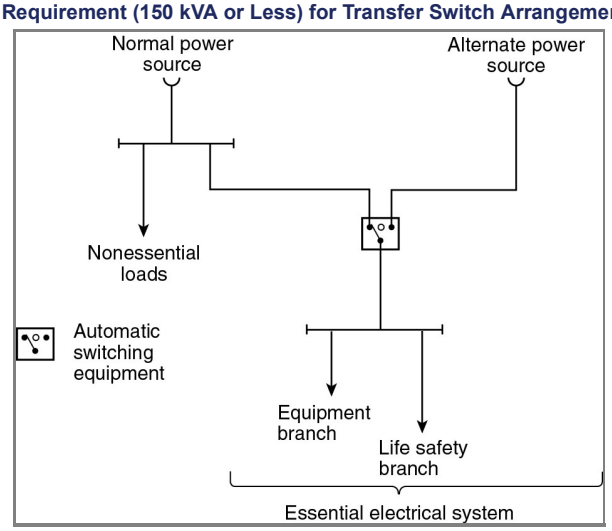


Figure Informational Note Figure 517.42(B)(b) Type 2 Essential Electrical Systems (Nursing Home and Limited Health Care Facilities) — Minimum Requirement (150 kVA or Less) for Transfer Switch Arrangement.



(C) Capacity of System.

The essential electrical system shall have capacity to meet the demand for the operation of all functions and equipment to be served by each branch at one time.

(D) Separation from Other Circuits.

The life safety branch and equipment branch shall be kept entirely independent of all other wiring and equipment. [**99:**6.7.6.3.1]

These circuits shall not enter the same raceways, boxes, or cabinets with other wiring except as follows:

(1) In transfer switches

(2) In exit or emergency luminaires supplied from two sources

(3) In a common junction box attached to exit or emergency luminaires supplied from two sources

(E) Receptacle Identification.

The electrical receptacles or the cover plates for the electrical receptacles supplied from the life safety or equipment branches shall have a distinctive color or marking so as to be readily identifiable. [**99:**6.7.6.3.2]

Informational Note: If color is used to identify these receptacles, the same color should be used throughout the facility. [**99:**A.6.7.6.3.2]

517.43 ~~–~~ **63** Automatic Connection to Life Safety and Equipment Branch.

The life safety and equipment branches shall be installed and connected to the alternate source of power specified in 517.41 so that all functions specified herein for the life safety and equipment branches are automatically restored to operation within 10 seconds after interruption of the normal source. [**99:**6.7.6.4.1]

No functions other than those listed in 517.43(A) through (G) shall be connected to the life safety branch. [**99:**6.7.6.2.1.5(D)]

The life safety branch shall supply power as follows:

(A) Illumination of Means of Egress.

Illumination of means of egress as is necessary for corridors, passageways, stairways, landings, and exit doors and all ways of approach to exits. Switching arrangement to transfer patient corridor lighting from general illumination circuits shall be permitted if only one of two circuits can be selected and both circuits cannot be extinguished at the same time.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Sections 7.8 and 7.9.

(B) Exit Signs.

Exit signs and exit directional signs.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Section 7.10.

(C) Alarm and Alerting Systems.

Alarm and alerting systems, including the following:

(1) Fire alarms

Informational Note No. 1: See NFPA *101*-2021, *Life Safety Code*, Sections 9.6 and 18.3.4.

(2) Alarms required for systems used for the piping of nonflammable medical gases

Informational Note No. 2: See NFPA 99-2021, *Health Care Facilities Code*, 6.7.5.1.2.5.

(D) Communications Systems.

Communications systems, where used for issuing instructions during emergency conditions. [**99:**6.7.5.1.2.4(3)]

(E) Generator Set Location.

Task illumination and select receptacles at the generator set location and essential electrical system transfer switch locations.

(F) Elevators.

Elevator cab lighting, control, communications, and signal systems. [**99:**6.7.5.1.2.4(5)]

(G) AC Equipment for Nondelayed Automatic Connection.

Generator accessories, including, but not limited to, the transfer fuel pump, electrically operated louvers, and other generator accessories essential for generator operation shall be arranged for automatic connection to the alternate power source. [**99:**6.7.6.2.1.6(C)]

517.44 ~~–~~ **64** Connection to Equipment Branch.

The equipment branch shall be installed and connected to the alternate power source such that equipment described in 517.35(A)(6) is automatically restored to operation at appropriate time-lag intervals following the energizing of the life safety and critical branches. [**99:**6.7.5.1.4.2(A)]

The equipment branch arrangement shall also provide for the additional connection of equipment listed in 517.44(B).

Exception: For essential electrical systems under 150 kVA, deletion of the time-lag intervals feature for delayed automatic connection to the equipment branch shall be permitted.

(A) Delayed Automatic Connections to Equipment Branch.

The following equipment shall be permitted to be connected to the equipment branch and shall be arranged for delayed automatic connection to the alternate power source:

(1) Task illumination and select receptacles in the following: [**99:**6.7.6.2.1.6(D)(1)]

(2) Patient care spaces [**99:** 6.7.6.2.1.6(D)(1)(a)]

(3) Medication preparation spaces

[**99:** 6.7.6.2.1.6(D)(1)(b)]

(4) Pharmacy dispensing space [**99:** 6.7.6.2.1.6(D)(1)(c)]

(5) Nurses' stations — unless adequately lighted by corridor luminaires [**99:** 6.7.6.2.1.6(D)(1)(d)]

(6) Supply, return, and exhaust ventilating systems for airborne infectious isolation rooms [**99:**6.7.6.2.1.6(D)(2)]

(7) Sump pumps and other equipment required to operate for the safety of major apparatus and associated control systems and alarms [**99:**6.7.6.2.1.6(D)(3)]

(8) Smoke control and stair pressurization systems [**99:**6.7.6.2.1.6(D)(4)]

(9) Kitchen hood supply or exhaust systems, or both, if required to operate during a fire in or under the hood [**99:**6.7.6.2.1.6(D)(5)]

(10) Nurse call systems [**99:**6.7.6.2.1.6(D)(6)]

(B) Delayed-Automatic or Manual Connection to the Equipment Branch.

The equipment specified in 517.44(B)(1) through (B)(4) shall be permitted to be connected to the equipment branch and shall be arranged for either delayed-automatic or manual connection to the alternate power source.

(1) Heating Equipment to Provide Heating for General Patient Rooms.

Heating of general patient rooms during disruption of the normal source shall not be required under any of the following conditions:

(1) The outside design temperature is higher than −6.7°C (20°F).

(2) The outside design temperature is lower than −6.7°C (20°F) and, where a selected room(s) is provided for the needs of all confined patients, then only such room(s) need be heated.

(3) The facility is served by a dual source of normal power as described in 517.30(D), Informational Note.

Informational Note: The outside design temperature is based on the 97.5 percent design values, as shown in Chapter 24 of the ASHRAE *Handbook of Fundamentals* (2013).

(2) Elevator Service.

In instances where interruptions of power would result in elevators stopping between floors, throw-over facilities shall be provided to allow the temporary operation of any elevator for the release of passengers.

(3) Optional Connections to the Equipment Branch.

Additional illumination, receptacles, and equipment shall be permitted to be connected only to the equipment branch.

(4) Multiple Systems.

Where one switch serves multiple systems as permitted in 517.43, transfer for all loads shall be nondelayed automatic.

[**99:**6.7.6.2.1.6(E)]

Informational Note: For elevator cab lighting, control, and signal system requirements, see 517.43(G). [**99:**A.6.7.6.2.1.6(E)(2)]

517.45 – **65** Essential Electrical Systems for Other Health Care Facilities.

(A) Essential Electrical Distribution.

If required by the governing body, the essential electrical distribution system for Category 3 patient care spaces shall be comprised of an alternate power system capable of supplying a limited amount of lighting and power service for the orderly cessation of procedures during a time normal electrical service is interrupted.

Informational Note: See NFPA 99-2021, *Health Care Facilities Code*.

(B) Electrical Life Support Equipment.

Where electrical life support equipment is required, the essential electrical distribution system shall be as described in 517.29 through 517.30.

(C) Category 1 Patient Care Spaces.

Where Category 1 patient care spaces are present, the essential electrical distribution system shall be in accordance with 517.29 through 517.30.

(D) Category 2 Patient Care Spaces.

Where Category 2 patient care spaces are present, the essential electrical distribution system shall be in accordance with 517.40 through 517.45.

(E) Power Systems.

If required, alternate power sources acceptable to the governing body shall comply with the requirements of NFPA 99-2021, *Health Care Facilities Code*.

Part IV. Inhalation Anesthetizing Locations

Informational Note: See NFPA 99-2021, *Health Care Facilities Code*, for further information regarding safeguards for anesthetizing locations.

517.~~60~~ 70 Anesthetizing Location Classification.

Informational Note: If either of the anesthetizing locations in 517.60(A) or 517.60(B) is designated a wet procedure location, refer to 517.20.

(A) Hazardous (Classified) Location.

(1) Use Location.

In a location where flammable anesthetics are employed, the entire area shall be considered to be a Class I, Division 1 location that extends upward to a level 1.52 m (5 ft) above the floor. The remaining volume up to the structural ceiling is considered to be above a hazardous (classified) location.

(2) Storage Location.

Any room or location in which flammable anesthetics or volatile flammable disinfecting agents are stored shall be considered to be a Class I, Division 1 location from floor to ceiling.

(B) Unclassified Location.

Any inhalation anesthetizing location designated for the exclusive use of nonflammable anesthetizing agents shall be considered to be an unclassified location.

517.~~61~~ 71 Wiring and Equipment.

(A) Within Hazardous (Classified) Anesthetizing Locations.

(1) Isolation.

Except as permitted in 517.160, each power circuit within, or partially within, a flammable anesthetizing location as referred to in 517.60 shall be isolated from any distribution system by the use of an isolated power system.

(2) Design and Installation.

Where an isolated power system is utilized, the isolated power equipment shall be listed as isolated power equipment, and the isolated power system shall be designed and installed in accordance with 517.160.

(3) Equipment Operating at More Than 10 Volts.

In hazardous (classified) locations referred to in 517.60, all fixed wiring and equipment and all portable equipment, including lamps and other utilization equipment, operating at more than 10 volts between conductors shall comply with the requirements of 501.1 through 501.25, and 501.100 through 501.150, and 501.30(B) and 501.30(B) for Class I, Division 1 locations. All such equipment shall be specifically approved for the hazardous atmospheres involved.

(4) Extent of Location.

Where a box, fitting, or enclosure is partially, but not entirely, within a hazardous (classified) location(s), the hazardous (classified) location(s) shall be considered to be extended to include the entire box, fitting, or enclosure.

(5) Receptacles and Attachment Plugs.

Receptacles and attachment plugs in a hazardous (classified) location(s) shall be listed for use in Class I, Group C hazardous (classified) locations and shall have provision for the connection of an equipment grounding conductor.

(6) Flexible Cord Type.

Flexible cords used in hazardous (classified) locations for connection to portable utilization equipment, including lamps operating at more than 8 volts between conductors, shall be of a type approved for extra-hard usage in accordance with Table 400.4 and shall include an additional equipment grounding conductor.

(7) Flexible Cord Storage.

A storage device for the flexible cord shall be provided and shall not subject the cord to bending at a radius of less than 75 mm (3 in.).

(B) Above Hazardous (Classified) Anesthetizing Locations.

(1) Wiring Methods.

Wiring above a hazardous (classified) location referred to in 517.60 shall be installed in rigid metal conduit, electrical metallic tubing, intermediate metal conduit, Type MI cable, or Type MC cable that employs a continuous, gas/vaportight metal sheath.

(2) Equipment Enclosure.

Installed equipment that may produce arcs, sparks, or particles of hot metal, such as lamps and lampholders for fixed lighting, cutouts, switches, generators, motors, or other equipment having make-and-break or sliding contacts, shall be of the totally enclosed type or be constructed so as to prevent escape of sparks or hot metal particles.

Exception: Wall-mounted receptacles installed above the hazardous (classified) location in flammable anesthetizing locations shall not be required to be totally enclosed or have openings guarded or screened to prevent dispersion of particles.

(3) Luminaires.

Surgical and other luminaires shall conform to 501.130(B).

Exception No. 1: The surface temperature limitations set forth in 501.130(B)(1) shall not apply.

Exception No. 2: Integral or pendant switches that are located above and cannot be lowered into the hazardous (classified) location(s) shall not be required to be explosionproof.

(4) Seals.

Listed seals shall be provided in conformance with 501.15, and 501.15(A)(4) shall apply to horizontal as well as to vertical boundaries of the defined hazardous (classified) locations.

(5) Receptacles and Attachment Plugs.

Receptacles and attachment plugs located above hazardous (classified) anesthetizing locations shall be listed for hospital use for services of prescribed voltage, frequency, rating, and number of conductors with provision for the connection of the equipment grounding conductor. This requirement shall apply to attachment plugs and receptacles of the 2-pole, 3-wire grounding type for single-phase, 120-volt, nominal, ac service.

(6) 250-Volt Receptacles and Attachment Plugs Rated 50 and 60 Amperes.

Receptacles and attachment plugs rated 250 volts, for connection of 50-ampere and 60-ampere ac medical equipment for use above hazardous (classified) locations, shall be arranged so that the 60-ampere receptacle will accept either the 50-ampere or the 60-ampere plug. Fifty-ampere receptacles shall be designed so as not to accept the 60-ampere attachment plug. The attachment plugs shall be of the 2-pole, 3-wire design with a third contact connecting to the insulated (green or green with yellow stripe) equipment grounding conductor of the electrical system.

(C) Unclassified Anesthetizing Locations.

(1) Wiring Methods.

Wiring serving unclassified locations, as defined in 517.60, shall be installed in a metal raceway system or cable assembly. The metal raceway system or cable armor or sheath assembly shall qualify as an equipment grounding conductor in accordance with 250.118. Type MC and Type MI cable shall have an outer metal armor, sheath, or sheath assembly that is identified as an equipment grounding conductor.

Exception: Pendant receptacle installations that employ listed Type SJO or equivalent hard usage or extra-hard usage, flexible cords suspended not less than 1.8 m (6 ft) from the floor shall not be required to be installed in a metal raceway or cable assembly.

(2) Receptacles and Attachment Plugs.

Receptacles and attachment plugs installed and used in unclassified locations shall be listed “hospital grade” for services of prescribed voltage, frequency, rating, and number of conductors with provision for connection of the equipment grounding conductor. This requirement shall apply to 2-pole, 3-wire grounding type for single-phase, 120-, 208-, or 240-volt, nominal, ac service.

(3) 250-Volt Receptacles and Attachment Plugs Rated 50 Amperes and 60 Amperes.

Receptacles and attachment plugs rated 250 volts, for connection of 50-ampere and 60-ampere ac medical equipment for use in unclassified locations, shall be arranged so that the 60-ampere receptacle will accept either the 50-ampere or the 60-ampere plug. Fifty-ampere receptacles shall be designed so as not to accept the 60-ampere attachment plug. The attachment plugs shall be of the 2-pole, 3-wire design with a third contact connecting to the insulated (green or green with yellow stripe) equipment grounding conductor of the electrical system.

517.~~62~~ 75 Grounding.

In any anesthetizing area, all metal raceways and metal-sheathed cables and all normally non–current-carrying conductive portions of fixed electrical equipment shall be connected to an equipment grounding conductor. Grounding and bonding in Class I locations shall comply with 501.30.

Exception: Equipment operating at not more than 10 volts between conductors shall not be required to be connected to an equipment grounding conductor.

517.~~63~~ 76 Grounded Power Systems in Anesthetizing Locations.

(A) Battery-Powered Lighting Units.

One or more battery-powered lighting units shall be provided and shall be permitted to be wired to the critical lighting circuit in the area and connected ahead of any local switches.

(B) Branch-Circuit Wiring.

Branch circuits supplying only listed, fixed, therapeutic and diagnostic equipment, permanently installed above the hazardous (classified) location and in unclassified locations, shall be permitted to be supplied from a normal grounded service, single- or three-phase system, provided the following apply:

(1) Wiring for grounded and isolated circuits does not occupy the same raceway or cable.

(2) All conductive surfaces of the equipment are connected to an equipment grounding conductor.

(3) Equipment (except enclosed X-ray tubes and the leads to the tubes) is located at least 2.5 m (8 ft) above the floor or outside the anesthetizing location.

(4) Switches for the grounded branch circuit are located outside the hazardous (classified) location.

Exception: Sections 517.63(B)(3) and (B)(4) shall not apply in unclassified locations.

(C) Fixed Lighting Branch Circuits.

Branch circuits supplying only fixed lighting shall be permitted to be supplied by a normal grounded service, provided the following apply:

(1) Such luminaires are located at least 2.5 m (8 ft) above the floor.

(2) All conductive surfaces of luminaires are connected to an equipment grounding conductor.

(3) Wiring for circuits supplying power to luminaires does not occupy the same raceway or cable for circuits supplying isolated power.

(4) Switches are wall-mounted and located above hazardous (classified) locations.

Exception: Sections 517.63(C)(1) and (C)(4) shall not apply in unclassified locations.

(D) Remote-Control Stations.

Wall-mounted remote-control stations for remote-control switches operating at 24 volts or less shall be permitted to be installed in any anesthetizing location.

(E) Location of Isolated Power Systems.

Where an isolated power system is utilized, the isolated power equipment shall be listed as isolated power equipment. Isolated power system equipment and its supply circuit shall be permitted to be located in an anesthetizing location, provided it is installed above a hazardous (classified) location or in an unclassified location.

(F) Circuits in Anesthetizing Locations.

Except as permitted above, each power circuit within, or partially within, a flammable anesthetizing location as referred to in 517.60 shall be isolated from any distribution system supplying other-than-anesthetizing locations.

517.~~64~~ 68 Low-Voltage Equipment and Instruments.

(A) Equipment Requirements.

Low-voltage equipment that is frequently in contact with the bodies of persons or has exposed current-carrying elements shall comply with one of the following:

(1) Operate on an electrical potential of 10 volts or less

(2) Be approved as intrinsically safe or double-insulated equipment

(3) Be moisture resistant

(B) Power Supplies.

Power shall be supplied to low-voltage equipment from one of the following:

(1) An individual portable isolating transformer (autotransformers shall not be used) connected to an isolated power circuit receptacle by means of an appropriate cord and attachment plug

(2) A common low-voltage isolating transformer installed in an unclassified location

(3) Individual dry-cell batteries

(4) Common batteries made up of storage cells located in an unclassified location

(C) Isolated Circuits.

Isolating-type transformers for supplying low-voltage circuits shall have both of the following:

(1) Approved means for insulating the secondary circuit from the primary circuit

(2) The core and case connected to an equipment grounding conductor

(D) Controls.

Resistance or impedance devices shall be permitted to control low-voltage equipment but shall not be used to limit the maximum available voltage to the equipment.

(E) Battery-Powered Appliances.

Battery-powered appliances shall not be capable of being charged while in operation unless their charging circuitry incorporates an integral isolating-type transformer.

(F) Receptacles or Attachment Plugs.

Any receptacle or attachment plug used on low-voltage circuits shall be of a type that does not permit interchangeable connection with circuits of higher voltage.

Informational Note: Any interruption of the circuit, even circuits as low as 10 volts, either by any switch or loose or defective connections anywhere in the circuit, may produce a spark that is sufficient to ignite flammable anesthetic agents.

Part V. Diagnostic Imaging and Treatment Equipment

517.~~70~~ 80 Applicability.

Nothing in this part shall be construed as specifying safeguards against possible radiation or magnetic fields.

Informational Note No. 1: Radiation safety and performance requirements of several classes of X-ray equipment are regulated under Public Law 90-602 and are enforced by the Department of Health and Human Services.

Informational Note No. 2: Information on radiation protection by the National Council on Radiation Protection and Measurements is published as *Reports of the National Council on Radiation Protection and Measurement*. These reports are obtainable from NCRP Publications, P.O. Box 30175, Washington, DC 20014.

Informational Note No. 3: Diagnostic imaging equipment includes, but is not limited to, the following:

(1) General radiographic (X-ray) equipment (mobile and fixed)
(2) General fluoroscopic equipment (mobile and fixed)
(3) Interventional equipment (mobile and fixed)
(4) Bone mineral density equipment
(5) Dental equipment
(6) Computerized tomography (CT) equipment
(7) Positron emission tomography (PET) equipment
(8) Nuclear medicine equipment
(9) Mammography equipment
(10) Magnetic resonance (MR) equipment
(11) Diagnostic ultrasound equipment
(12) Electrocardiogram equipment

Informational Note No. 4: Treatment equipment includes, but is not limited to, the following:

(1) Linear accelerators
(2) Gamma knife
(3) Cyber knife
(4) Proton therapy
(5) Tomotherapy

517.~~71~~ 81 Connection to Supply Circuit.

(A) Fixed and Stationary Diagnostic Imaging and Treatment Equipment.

Fixed and stationary diagnostic imaging and treatment equipment shall be connected to the power supply by means of a wiring method complying with applicable requirements of Chapters 1 through 4 of this *Code*, as modified by this article.

Exception: Equipment properly supplied by a branch circuit rated at not over 30 amperes shall be permitted to be supplied through a suitable attachment plug and hard-service cable or cord.

(B) Portable, Mobile, and Transportable Diagnostic Imaging and Treatment Equipment.

Individual branch circuits shall not be required for portable, mobile, and transportable medical diagnostic imaging and treatment equipment requiring a capacity of not over 60 amperes.

(C) Over 1000-Volt Supply.

Circuits and equipment operated on a supply circuit of over 1000 volts shall comply with Parts I through IV of Article 490.

517.~~72~~ 82 Disconnecting Means.

(A) Capacity.

A disconnecting means rated for at least 50 percent of the input required for the momentary rating or 100 percent of the input required for the long-time rating of the diagnostic imaging and treatment equipment, whichever is greater, shall be provided in the supply circuit.

(B) Location.

The disconnecting means shall be operable from a location readily accessible from the control location.

(C) Portable, Mobile, and Transportable Diagnostic Imaging and Treatment Equipment.

For equipment connected to a 120-volt branch circuit of 30 amperes or less, a grounding-type attachment plug and receptacle of proper rating shall be permitted to serve as a disconnecting means.

517.~~73~~ 85 Rating of Supply Conductors and Overcurrent Protection.

(A) Branch Circuits.

The ampacity of supply branch-circuit conductors and the current rating of overcurrent protective devices shall not be less than 50 percent of the momentary rating or 100 percent of the long-time rating, whichever is greater.

(B) Feeders.

The ampacity of supply feeders and the current rating of overcurrent protective devices supplying two or more branch circuits supplying diagnostic imaging and treatment equipment shall not be less than 50 percent of the momentary demand rating of the largest unit, plus 10 percent of the momentary demand rating of the next largest unit, plus 5 percent of the momentary demand rating of each additional unit.

Informational Note No. 1: The minimum conductor size for branch and feeder circuits is also governed by voltage regulation requirements. For a specific installation, the manufacturer usually specifies minimum distribution transformer and conductor sizes, rating of disconnecting means, and overcurrent protection.

Informational Note No. 2: The ampacity of the branch-circuit conductors and the ratings of disconnecting means and overcurrent protection for diagnostic imaging and treatment equipment are usually designated by the manufacturer for the specific installation.

517.~~74~~ 86 Control Circuit Conductors.

(A) Number of Conductors in Raceway.

The number of control circuit conductors installed in a raceway shall be determined in accordance with 300.17.

(B) Minimum Size of Conductors.

Size 18 AWG or 16 AWG fixture wires in accordance with 725.49 and flexible cords shall be permitted for the control and operating circuits of diagnostic imaging and treatment equipment and auxiliary equipment where protected by not larger than 20-ampere overcurrent devices.

517.~~76~~ 90 Transformers and Capacitors.

Transformers and capacitors that are part of diagnostic imaging and treatment equipment shall not be required to comply with Parts I and II of Articles 450 and 460.

Capacitors shall be mounted within enclosures of insulating material or grounded metal.

517.~~77~~ 92 Installation of Cables with Grounded Shields.

Cables with grounded shields shall be permitted to be installed in cable trays or cable troughs along with control and power supply conductors without the need for barriers to separate the wiring.

517.~~78~~ 94 Guarding and Grounding.

(A) High-Voltage Parts.

All high-voltage parts shall be mounted within grounded enclosures. The connection from the high-voltage equipment to other high-voltage components shall be made with high-voltage shielded cables.

(B) Low-Voltage Cables.

Low-voltage cables connecting to oil-filled units that are not completely sealed, such as transformers, condensers, oil coolers, and high-voltage switches, shall have insulation of the oil-resistant type.

(C) Non–Current-Carrying Metal Parts.

Non–current-carrying metal parts of diagnostic imaging and treatment equipment (e.g., controls, tables, transformer tanks, shielded cables) shall be connected to an equipment grounding conductor in accordance with Part VII of Article 250, as modified by 517.13(A) and (B).

Part VI. Communications, Signaling Systems, Data Systems, Fire Alarm Systems, and Systems Less Than 120 Volts, Nominal

517.~~80~~ 100 Patient Care Spaces.

Equivalent insulation and isolation to that required for the electrical distribution systems in patient care areas shall be provided for communications, signaling systems, data system circuits, fire alarm systems, and systems less than 120 volts, nominal.

Class 2 and Class 3 signaling and communications systems, Class 2 circuits that transmit power and data to a powered device, and power-limited fire alarm systems shall not be required to comply with the grounding requirements of 517.13, to comply with the mechanical protection requirements of 517.31(C)(3)(5), or to be enclosed in raceways, unless otherwise specified by Chapters 7 or 8.

Secondary circuits of transformer-powered communications or signaling systems shall not be required to be enclosed in raceways unless otherwise specified by Chapters 7 or 8. [**99:**6.7.2.2.7]

Informational Note: See ANSI/NEMA C137.3-2017, *American National Standard for Lighting Systems — Minimum Requirements for Installation of Energy Efficient Power over Ethernet (PoE) Lighting Systems*, for information on installation of cables for PoE lighting systems.

517.~~81~~ 101 Other-Than-Patient-Care Spaces.

In other-than-patient-care spaces, installations shall be in accordance with other parts of this *Code*.

517.~~82~~ 102 Signal Transmission Between Appliances.

(A) General.

Permanently installed signal cabling from an appliance in a patient location to remote appliances shall employ a signal transmission system that prevents hazardous grounding interconnection of the appliances.

Informational Note: See 517.13(A) for additional grounding requirements in patient care spaces.

(B) Common Signal Grounding Wire.

Common signal grounding wires (i.e., the chassis ground for single-ended transmission) shall be permitted to be used between appliances all located within the patient care vicinity, provided the appliances are served from the same reference grounding point.

Part VII. Isolated Power Systems

517.~~160~~ 110 Isolated Power Systems.

(A) Installations.

(1) Isolated Power Circuits.

Each isolated power circuit shall be controlled by a switch or circuit breaker that has a disconnecting pole in each isolated circuit conductor to simultaneously disconnect all power. Such isolation shall be accomplished by means of one or more isolation transformers, by means of generator sets, or by means of electrically isolated batteries. Conductors of isolated power circuits shall not be installed in cables, raceways, or other enclosures containing conductors of another system.

(2) Circuit Characteristics.

Circuits supplying primaries of isolating transformers shall operate at not more than 600 volts between conductors and shall be provided with proper overcurrent protection. The secondary voltage of such transformers shall not exceed 600 volts between conductors of each circuit. All circuits supplied from such secondaries shall be ungrounded and shall have an approved overcurrent device of proper ratings in each conductor. Circuits supplied directly from batteries or from motor generator sets shall be ungrounded and shall be protected against overcurrent in the same manner as transformer-fed secondary circuits. If an electrostatic shield is present, it shall be connected to the reference grounding point.

(3) Equipment Location.

The isolating transformers, motor generator sets, batteries and battery chargers, and associated primary or secondary overcurrent devices shall not be installed in hazardous (classified) locations. The isolated secondary circuit wiring extending into a hazardous anesthetizing location shall be installed in accordance with 501.10.

(4) Isolation Transformers.

An isolation transformer shall not serve more than one operating room except as covered in 517.160(A)(4)(a) and (A)(4)(b).

For purposes of this section, anesthetic induction rooms are considered part of the operating room or rooms served by the induction rooms.

(a) *Induction Rooms.* Where an induction room serves more than one operating room, the isolated circuits of the induction room shall be permitted to be supplied from the isolation transformer of any one of the operating rooms served by that induction room.

(b) *Higher Voltages.* Isolation transformers shall be permitted to serve single receptacles in several patient areas where the following apply:

(3) The receptacles are reserved for supplying power to equipment requiring 150 volts or higher, such as portable X-ray units.

(4) The receptacles and mating plugs are not interchangeable with the receptacles on the local isolated power system.

(5) Conductor Identification.

The isolated circuit conductors shall be identified as follows:

(1) Isolated Conductor No. 1 — Orange with at least one distinctive colored stripe other than white, green, or gray along the entire length of the conductor

(2) Isolated Conductor No. 2 — Brown with at least one distinctive colored stripe other than white, green, or gray along the entire length of the conductor

For 3-phase systems, the third conductor shall be identified as yellow with at least one distinctive colored stripe other than white, green, or gray along the entire length of the conductor. Where isolated circuit conductors supply 125-volt, single-phase, 15- and 20-ampere receptacles, the striped orange conductor(s) shall be connected to the terminal(s) on the receptacles that are identified in accordance with 200.10(B) for connection to the grounded circuit conductor.

(6) Wire-Pulling Compounds.

Wire-pulling compounds that increase the dielectric constant shall not be used on the secondary conductors of the isolated power supply.

Informational Note No. 1: It is desirable to limit the size of the isolation transformer to 10 kVA or less and to use conductor insulation with low leakage to meet impedance requirements.

Informational Note No. 2: Minimizing the length of branch-circuit conductors and using conductor insulations with a dielectric constant less than 3.5 and insulation resistance constant greater than 6100 megohm-meters (20,000 megohm-feet) at 16°C (60°F) reduces leakage from line to ground, reducing the hazard current.

(B) Line Isolation Monitor.

(1) Characteristics.

In addition to the usual control and overcurrent protective devices, each isolated power system shall be provided with a listed continually operating line isolation monitor that indicates total hazard current. The monitor shall be designed such that a green signal lamp, conspicuously visible to persons in each area served by the isolated power system, remains lighted when the system is adequately isolated from ground. An adjacent red signal lamp and an audible warning signal (remote if desired) shall be energized when the total hazard current (consisting of possible resistive and capacitive leakage currents) from either isolated conductor to ground reaches a threshold value of 5 mA under nominal line voltage conditions. The line monitor shall not alarm for a fault hazard of less than 3.7 mA or for a total hazard current of less than 5 mA.

Exception: A system shall be permitted to be designed to operate at a lower threshold value of total hazard current. A line isolation monitor for such a system shall be permitted to be approved, with the provision that the fault hazard current shall be permitted to be reduced but not to less than 35 percent of the corresponding threshold value of the total hazard current, and the monitor hazard current is to be correspondingly reduced to not more than 50 percent of the alarm threshold value of the total hazard current.

(2) Impedance.

The line isolation monitor shall be designed to have sufficient internal impedance such that, when properly connected to the isolated system, the maximum internal current that can flow through the line isolation monitor, when any point of the isolated system is grounded, shall be 1 mA.

Exception: The line isolation monitor shall be permitted to be of the low-impedance type such that the current through the line isolation monitor, when any point of the isolated system is grounded, will not exceed twice the alarm threshold value for a period not exceeding 5 milliseconds.

Informational Note: Reduction of the monitor hazard current, provided this reduction results in an increased “not alarm” threshold value for the fault hazard current, will increase circuit capacity.

(3) Ammeter.

An ammeter calibrated in the total hazard current of the system (contribution of the fault hazard current plus monitor hazard current) shall be mounted in a plainly visible place on the line isolation monitor with the “alarm on” zone at approximately the center of the scale.

Exception: The line isolation monitor shall be permitted to be a composite unit, with a sensing section cabled to a separate display panel section on which the alarm or test functions are located.

Informational Note: It is desirable to locate the ammeter so that it is conspicuously visible to persons in the anesthetizing location.

Additional Proposed Changes

File Name	Description	Approved
.1626359038126		

Statement of Problem and Substantiation for Public Comment

PI 3333 in the First Draft meeting asked CMP 15 to review the numbering system in the Articles as related to the Style Manual. This review was never fully vetted by the panel. This second draft proposal is a recommendation to NFPA staff to review the numbering system used in 517 and provide space for insertion of new language without the panel having to make wholesale numbering changes.

2023 NEC 2nd Draft Numbering Changes to Article 517

Part 1. General (Number Ranges 517.1 - 517.9)

Current Number:	To Become:	New Number:
517.1	No Change	
517.4	No Change	
517.6	No Change	

Part II. Wiring And Protection Number Range 517.10 - 517.39

Current Number:	To Become:	New Number:
517.10	No Change	
517.12	No Change	
517.13	No Change	
517.14	No Change	
517.16	No Change	
517.17	517.21	
517.18	517.24	
517.19	517.25	
517.20	517.29	
517.21	517.30	
517.22	517.35	

Part III. Essential Electrical Systems (Number Range 517.40 - 517.69)

Current Number:	To Become:	New Number:
517.25	517.40	
517.26	517.42	
517.29	517.43	
517.30	517.45	
517.31	517.46	
517.32	517.47	
517.33	517.50	
517.34	517.51	
517.35	517.52	
517.40	517.60	
517.41	517.61	
517.42	517.62	
517.43	517.63	
517.44	517.64	
517.45	517.65	

Part VI. Anesthetizing Location Classification. (Number Range 517.70 - 517.79)

Current Number:	To Become:	New Number:
517.60	517.70	
517.61	517.71	

517.62	517.75
517.63	517.76
517.64	517.68

Part V. Diagnostic Imaging and Treatment Equipment. (Number Range 517.80 - 517.99)

Current Number:	To Become:	New Number:
517.70	517.80	
517.71	517.81	
517.72	517.82	
517.73	517.85	
517.74	517.86	
517.76	517.90	
517.77	517.92	
517.78	517.94	

Part V. Communications, Signalling Systems, Data Systems, Fire Alarm Systems, and Systems Less Than 120 Volts, Nominal. (Number Range 517.100 - 517.109)

Current Number:	To Become:	New Number:
517.80	517.100	
517.81	517.101	
517.82	517.102	

Part VI. Isolated Power Systems. (Number Range 517.110 - 517.120)

Current Number:	To Become:	New Number:
517.160	517.110	

Related Item

- PI 3333

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Committee: NEC-P15

Public Comment No. 1413-NFPA 70-2021 [Section No. 517.4]

517.4 General Installation — Construction Criteria.

The requirements of this article ~~shall~~ specify the installation criteria and wiring methods that minimize electrical hazards by the maintenance of adequately low potential differences only between exposed conductive surfaces that are likely to become energized and could be contacted by a patient.

Informational Note: In a health care facility, it is difficult to prevent the occurrence of a conductive or capacitive path from the patient's body to some grounded object, because that path might be established accidentally or through instrumentation directly connected to the patient. Other electrically conductive surfaces that might make an additional contact with the patient, or instruments that might be connected to the patient, then become possible sources of electric currents that can traverse the patient's body. The hazard is increased as more apparatus is associated with the patient, therefore more intensive precautions are needed. Control of electric shock hazard requires the limitation of electric current that might flow in an electrical circuit involving the patient's body by raising the resistance of the conductive circuit that includes the patient, or by insulating exposed surfaces that might become energized, in addition to reducing the potential difference that can appear between exposed conductive surfaces in the patient care vicinity, or by combinations of these methods. A special problem is presented by the patient with an externalized direct conductive path to the heart muscle. The patient could be electrocuted at current levels so low that additional protection in the design of appliances, insulation of the catheter, and control of medical practice is required.

Statement of Problem and Substantiation for Public Comment

The first draft uses mandatory language in a section that is informational. Who is subject to this mandatory "requirement"? The CMP? Certainly not the code user, how would he or she violate this "requirement"?

Related Item

• FR 8151

Submitter Information Verification

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Committee: NEC-P15

Public Comment No. 523-NFPA 70-2021 [Section No. 517.10(B)]

(B) Not Covered.

Part II shall not apply to the following:
(1) Business offices, corridors, waiting rooms, and the like in clinics, medical and dental offices, and outpatient facilities

Exception: 15- and 20-ampre, 125- and 250- volt nonlocking-type receptacles located in business offices, corridors and the like shall not be required to provide protection as described in 406.12 (5)

(2) Spaces of nursing homes and limited care facilities wired in accordance with Chapters 1 through 4 of this Code where these spaces are used exclusively as patient sleeping rooms

~~Informational Note No. 1: See 406.12(5) for receptacles located in health care facility business offices, corridors, and waiting rooms that are required to be tamper resistant.~~

~~Informational Note No. 2: See 210.12(D) for~~
Exception: 120-volt, single-phase, 15- and 20-ampre branch circuits supplying outlets and

~~receptacles located~~
devices installed in patient

~~sleeping~~
sleeping rooms in nursing homes and limited - care facilities

~~that are connected to arc-fault circuit-interrupter circuits.~~
shall not be required to be protected as described in 210.12 (A)(1) through (6).

(3) Areas used exclusively for any of the following purposes:

(a) Intramuscular injections (immunizations)

(b) Psychiatry and psychotherapy

(c) Alternative medicine

(d) Optometry

(e) Pharmacy services not contiguous to health care facilities

Informational Note No. 3: See NFPA *101* -2021, *Life Safety Code* .

Statement of Problem and Substantiation for Public Comment

The only change in this comment is the deletion of the informational notes and the two new exceptions.

In accordance with Standards Council Decision D#19-12, "… the Correlating Committee stated that CMP 2 has jurisdiction to address GENERAL BRANCH circuit wiring and protection methods only, and that [210.12(C)] only addresses a wiring and protection methods that are not otherwise addressed by CMP 15 in Article 517. The Standards Council and Correlating Committee encouraged CMP 15 to modify the relevant section in Article 517 if the panel believed an occupancy specific exclusion was warranted. The Council found this to be a reasonable approach to addressing overlapping functions in scopes. Section 90.3 specifically states that chapter 5 covers special occupancies, not chapter 2.

CMP-15 has the authority to act on this requirement by addressing it within article 517.

The change is being submitted because the inclusion of AFCI's in "patient sleeping rooms in nursing homes and limited-care facilities" has created a lot of confusion and setup potential hazardous and life threatening situations. Since this requirement has been included in the NEC and in health care facilities that have installed AFCI the number of nuisance trips have significantly increased. This is potentially dangerous when the equipment may be life support equipment, either ventilators or CPAP machines. These devices in health care facilities need to be studied further to understand the potential life impact and risks being introduced into health care facilities.

In addition, the language fails to define where these are required and how they would be applied in many settings. What about critical access hospitals with swing beds? what are the implications of having AFCIs serving hospital beds that swing to nursing home beds? how is a limited care facility defined? does that include alcohol treatment facilities? Board and care facilities?

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 167-NFPA 70-2021 [Section No. 210.12(D)]	
Public Comment No. 524-NFPA 70-2021 [Section No. 406.12]	
Public Comment No. 167-NFPA 70-2021 [Section No. 210.12(D)]	
Public Comment No. 524-NFPA 70-2021 [Section No. 406.12]	

Related Item

• FR-8089

Submitter Information Verification

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Committee:	NEC-P15

Public Comment No. 1414-NFPA 70-2021 [Section No. 517.13(B)(1)]

(1) General.

An insulated copper equipment grounding conductor that is clearly identified along its entire length by green insulation and installed with the branch circuit conductors within the wiring method in accordance with 517.13(A) shall be ~~directly~~ connected to the following:

(1) Grounding terminals of all receptacles other than isolated ground receptacles

(2) Metal outlet boxes, metal device boxes, or metal enclosures

(3) Non–current-carrying conductive surfaces of fixed electrical equipment likely to become energized that are subject to personal contact, operating at over 100 volts

Exception No. 1: For other than isolated ground receptacles, an insulated equipment bonding jumper that directly connects to the equipment grounding conductor shall be permitted to connect the box and receptacle(s) to the equipment grounding conductor. Isolated ground receptacles shall be connected in accordance with 517.16.

Exception No. 2: Metal faceplates shall be connected to an effective ground-fault current path by means of a metal mounting screw(s) securing the faceplate to a metal yoke or strap of a receptacle or to a metal outlet box.

Statement of Problem and Substantiation for Public Comment

I can't "directly" connect an EGC to both the metal box and the receptacle inside of it. I can only "directly" connect it to one or the other.

Related Item

• FR 8170

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Public Comment No. 1690-NFPA 70-2021 [Section No. 517.20]

517.20 Wet Procedure Locations.

(A) Receptacles and Fixed Equipment.

Wet procedure locations shall be provided with special protection against electric shock. [**99:**6.3.2.3.1]

This special protection shall be provided ~~as follows~~ by one of the following :

(1) Isolated power systems that remain in operation in the event of a single line-to-ground fault condition that inherently limits the possible ground-fault current due to a first fault to a low value, without interrupting the power supply.

Informational Note No. 1: Isolated power systems can eliminate the danger of electric shock to patients who might be more susceptible to leakage current and unable to move in their beds.

(2) Power distribution system in which the power supply is interrupted if the ground-fault current does, in fact, exceed the trip value of a Class A GFCI.

Informational Note No. 2: See ANSI/UL 943-2018, *Ground-Fault Circuit-Interrupters*, Annex E, and, in accordance with 110.3(B), the manufacturers' installation instructions of listed ground-fault circuit interrupters for information on the supply connection of life-support equipment to circuits providing ground-fault circuit-interrupter (GFCI) protection of personnel at outlets.

[**99:**6.3.2.3.2]

Exception: Branch circuits supplying only listed, fixed, therapeutic, and diagnostic equipment shall be permitted to be supplied from a grounded service, single- or 3-phase system if the following conditions are met:

(1) Wiring for grounded and isolated circuits does not occupy the same raceway.

(2) All conductive surfaces of the equipment are connected to an insulated copper equipment grounding conductor.

(B) Isolated Power Systems.

Where an isolated power system is utilized, the isolated power equipment shall be listed as isolated power equipment, and the isolated power system shall be designed and installed in accordance with 517.160.

Informational Note: See Part IV of Article 680 for requirements on the installation of therapeutic pools and tubs.

Statement of Problem and Substantiation for Public Comment

Without this suggestion, the section requires BOTH IPS and GFCI.

Related Item

- • FR 8161

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Public Comment No. 930-NFPA 70-2021 [Section No. 517.20]

517.20 Wet Procedure Locations.

(A) Receptacles and Fixed Equipment.

Wet procedure locations shall be provided with special protection against electric shock. [**99:**6.3.2.3.1]

This special protection shall be provided as follows:

(1) Isolated power systems that remain in operation in the event of a single line-to-ground fault condition that inherently limits the possible ground-fault current due to a first fault to a low value, without interrupting the power supply.

Informational Note No. 1: Isolated power systems can eliminate the danger of electric shock to patients who might be more susceptible to leakage current and unable to move in their beds.

(2) Power distribution system in which the power supply is interrupted if the ground-fault current does, in fact, exceed the trip value of a Class A GFCI.

Informational Note No. 2: See ANSI/UL 943-2018, *Ground-Fault Circuit-Interrupters*, Annex E, and, in accordance with 110.3(B), the manufacturers' installation instructions of listed ground-fault circuit interrupters for information on the supply connection of life-support equipment to circuits providing ground-fault circuit-interrupter (GFCI) protection of personnel at outlets.

[**99:**6.3.2.3.2]

Exception: Branch circuits supplying only listed, fixed, therapeutic, and diagnostic equipment shall be permitted to be supplied from a grounded service, single- or 3-phase system if the following conditions are met:

(1) Wiring for grounded and isolated circuits does not occupy the same raceway.

(2) All conductive surfaces of the equipment are connected to an insulated copper equipment grounding conductor.

(B) Isolated Power Systems.

Where an isolated power system is utilized, the isolated power equipment shall be listed as isolated power equipment, and the isolated power system shall be designed and installed in accordance with 517.160.

Informational Note: See Part IV of Article 680 for requirements on the installation of therapeutic pools and tubs.

Additional Proposed Changes

File Name	Description	Approved
15_CN_181.pdf	70_CN181	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 181 appeared in the First Draft Report on First Revision No. 8161

The Correlating Committee directs that CMP-15 revise Informational Note No. 2 to remove requirements in accordance with 3.1.3 of the NEC Style Manual.

517 .20(8) Informational Note: The Correlating Committee directs that CM P-15 review the informational note for accuracy regarding which part of Article 680 is referenced. It would appear that Part VI would be more applicable.

The Correlating Committee directs that FR-8161 will be sent to CMP-17 for information.

Related Item

• First Revision No. 8161

Submitter Information Verification

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Committee: NEC-P15

Correlating Committee Note No. 181-NFPA 70-2021 [Section No. 517.20]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 12:31:34 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs that CMP-15 revise Informational Note No. 2 to remove requirements in accordance with 3.1.3 of the NEC Style Manual.

517.20(B) Informational Note: The Correlating Committee directs that CMP-15 review the informational note for accuracy regarding which part of Article 680 is referenced. It would appear that Part VI would be more applicable.

The Correlating Committee directs that FR-8161 will be sent to CMP-17 for information.

First Revision No. 8161-NFPA 70-2020 [Section No. 517.20]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1822-NFPA 70-2021 [Section No. 517.22]

517.

~~22 Demand~~

22 Demand Factors.

Demand factors for general-use receptacles and individual branch circuits not exceeding 150 volts to ground shall be permitted to be applied in accordance with 517.22(A) , and (B).

Informational Note: See Article 100 for the definitions of patient care space categories.

(A)

~~General~~

General -Use Receptacles in Category 1 and Category 2 Patient Care Spaces .

~~In addition to demand factors allowed by other sections of this *Code* , the demand~~

The demand factor for general-use receptacles in Category 1 and Category 2 patient cares spaces shall be permitted to be calculated in accordance with Table 517.22(A).

Table 517.22(A) Demand Factors for General-Use Receptacles in

~~Health Care Facilities~~

Category 1 and Category 2 Patient Care Spaces.

Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	**Demand Factor (%)**
First 5	
~~.0 kVA~~	
,000 or less	100
~~Second 5.0 kVA to 10kVA~~	
Next 5,000 to 10,000	50
Remainder over 10	
~~kVA~~	
,000	25

Informational Note:

~~See~~

See 220.14(I) for the calculation of general-use receptacle loads.

(B)

~~Receptacles for Designated Equipment. Individual branch circuits supplying receptacles for equipment~~

General-Use Receptacles in Category 3 and Category 4 patient care spaces.

The demand factor for general-use receptacles in Category 3 and Category 4 patient care spaces shall be permitted to be calculated in accordance with Table 517.22(B).

~~Table 517~~

Table 517 .22(B)

~~Demand~~

Demand Factors for

~~Equipment Supplied by Individual Branch Circuits in Health Care Facilities Equipment Supplied by Individual Branch Circuits Demand Factor (%) Largest five connected loads 100 Six or more connected loads 50~~

~~Informational Note: See 220.60 for noncoincident load calculations.~~

General Use Receptacles in Category 3 and Category 4 Patient Care Spaces	
Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	**Demand Factor (%)**

General Use Receptacles in Category 3 and Category 4 Patient Care Spaces	
Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	**Demand Factor (%)**
First 10,000 or less	100
Remainder over 10,000 kVA at	50

Additional Proposed Changes

File Name	Description	Approved
NEC_Healthcare_Demand_Factor_TG_-_Final_Document_Panel_15_Submittal.docx	Proposed revisions and substantiation	

Statement of Problem and Substantiation for Public Comment

This Public Comment is being submitted on behalf of the CMP2/CMP15 Demand Factor Task Group. The Task Group members consisted of Rich Holub, Robert Osborne, David Johnson, Mark Daniel Cook, Tom Domitrovich, John McCamish, Mark Hilbert, Todd Lottmann, Chad Kennedy, Chad Beebe, Walt Vernon, Dave Dagenais, Krista Biason and Jason Dantona. This Public Comments seeks to replace the First Draft 517.22 text and tables. A correlating Public Comment has been submitted to CMP2 to add a new 220.48(A) and (B) to point users to the optional demand factors in Article 517.

The CMP2/CMP15 task group was formed to resolve a correlation issue that resulted from actions taken during the first draft of the 2023 NEC. The task group was charged with proposing language that would resolve the correlation issue with feedback from CMP2, CMP15, and other key contributors. The recommended revision would place a permissive rule in Article 220 to point users to an optional method in Article 517 for patient care spaces in proposed 220.48(A). A new 220.48(B) is also proposed to point the user to the demand factors for diagnostic imaging and treatment equipment and to increase usability of the code.
Table 517.22(A) from the first draft was revised to be limited to Category 1 and Category 2 patient care spaces where the main issue of a large number of general use receptacles exists. Based on the large number of receptacles required in Category 1 and Category 2 patient care spaces and the data established as part of an NFPA Research Foundation project, this public comment offers a reasonable set of demand factors that can be applied when calculating the feeder and service loads for receptacle outlets in these patient care spaces. By making the use of this table a permissive application, as opposed to a mandatory requirement, the requirements of Article 220 can be applied if desired. A new Informational Note was added to direct users to 220.14(I) for the calculation of general-use receptacle loads.
Table 517.22(B) from the first draft was removed as there was insufficient substantiation to justify applying demand factors to cord- and plug-connected loads served by individual branch circuits. A new Table 517.22(B), which essentially replicates the requirements from Article 220, is proposed to clarify how to apply demand factors for Category 3 and Category 4 patient care spaces.

The CMP2/CMP15 task group proposes this structure and the associated demand factors to represent a balanced view from both code making panels. The correlating committee placed purview under CMP2 for the demand factors and this task group is recommending this structure including; the permissive language in 220.48, locating the demand factor tables for general purpose receptacles in Category 1 and 2 and Category 3 and 4 patient care spaces in Article 517 and the removal of demand factor table for equipment fed by individual branch circuits. If any of these conditions change the task group requests the correlating committee reassess the purview.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1821-NFPA 70-2021 [Section No. 220.48]	
Public Comment No. 1821-NFPA 70-2021 [Section No. 220.48]	

Related Item

- FR 8222

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Submittal Date: Wed Aug 18 07:55:39 EDT 2021
Committee: NEC-P15

Section No. 517.22 (replaces the First Draft 517.22)

517.22 Demand Factors.
Demand factors for general-use receptacles and individual branch circuits not exceeding 150 volts to ground shall be permitted to be applied in accordance with 517.22(A), and (B).

Informational Note: See Article 100 for the definitions of patient care space categories.

(A) General-Use Receptacles in Category 1 and Category 2 Patient Care Spaces.
The demand factor for general-use receptacles in Category 1 and Category 2 patient cares spaces shall be permitted to be calculated in accordance with Table 517.22(A).

Table 517.22(A) Demand Factors for General-Use Receptacles in Category 1 and Category 2 Patient Care Spaces.

Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	Demand Factor (%)
First 5,000 or less	100
Next 5,000 to 10,000	50
Remainder over 10,000	25

Informational Note: See 220.14(I) for the calculation of general-use receptacle loads.

(B) General-Use Receptacles in Category 3 and Category 4 patient care spaces.
The demand factor for general-use receptacles in Category 3 and Category 4 patient care spaces shall be permitted to be calculated in accordance with Table 517.22(B).

Table 517.22(B) Demand Factors for General Use Receptacles in Category 3 and Category 4 Patient Care Spaces

Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	Demand Factor (%)
First 10,000 or less	100
Remainder over 10,000 kVA at	50

Substantiation:

This Public Comment is being submitted on behalf of the CMP2/CMP15 Demand Factor Task Group. The Task Group members consisted of Rich Holub, Robert Osborne, David Johnson, Mark Daniel Cook, Tom Domitrovich, John McCamish, Mark Hilbert, Todd Lottmann, Chad Kennedy, Chad Beebe, Walt Vernon, Dave Dagenais, Krista Biason and Jason Dantona. This Public Comments seeks to replace the First Draft 517.22 text and tables. A correlating Public Comment has been submitted to CMP2 to add a new 220.48(A) and (B) to point users to the optional demand factors in Article 517.

The CMP2/CMP15 task group was formed to resolve a correlation issue that resulted from actions taken during the first draft of the 2023 NEC. The task group was charged with proposing language that would resolve the correlation issue with feedback from CMP2, CMP15, and other key contributors. The recommended revision would place a permissive rule in Article 220 to point users to an optional method in Article 517 for patient care spaces in proposed 220.48(A). A new 220.48(B) is also proposed to point the user to the demand factors for diagnostic imaging and treatment equipment and to increase usability of the code.

Table 517.22(A) from the first draft was revised to be limited to Category 1 and Category 2 patient care spaces where the main issue of a large number of general use receptacles exists. Based on the large number of receptacles required in Category 1 and Category 2 patient care spaces and the data established as part of an NFPA Research Foundation project, this public comment offers a reasonable set of demand factors that can be applied when calculating the feeder and service loads for receptacle outlets in these patient care spaces. By making the use of this table a permissive application, as opposed to a mandatory requirement, the requirements of Article 220 can be applied if desired. Table 517.22(B) from the first draft was removed as there was insufficient substantiation to justify applying demand factors to cord- and plug-connected loads served by individual branch circuits. A new Table 517.22(B), which essentially replicates the requirements from Article 220, is proposed to clarify how to apply demand factors for Category 3 and Category 4 patient care spaces.

The CMP2/CMP15 task group proposes this structure and the associated demand factors to represent a balanced view from both code making panels. The correlating committee placed purview under CMP2 for the demand factors and this task group is recommending this structure including; the permissive language in 220.48, locating the demand factor tables for general purpose receptacles in Category 1 and 2 and Category 3 and 4 patient care spaces in Article 517 and the removal of demand factor table for equipment fed by individual branch circuits. If any of these conditions change the task group requests the correlating committee reassess the purview.

Public Comment No. 1884-NFPA 70-2021 [Section No. 517.22]

~~**517.22** Demand Factors.~~

~~Demand factors for general-use receptacles and individual branch circuits not exceeding 150 volts to ground shall be permitted to be applied in accordance with 517.22(A) and (B).~~

~~**(A)** General-Use Receptacles.~~

~~In addition to demand factors allowed by other sections of this *Code*, the demand factor for general-use receptacles shall be permitted to be calculated in accordance with Table 517.22(A).~~

~~Table 517.22(A) Demand Factors for General-Use Receptacles in Health Care Facilities~~

~~Portion of Receptacle Load to Which Demand Factor Applies Demand Factor (%) First 5.0 kVA or less 100 Second 5.0 kVA to 10kVA 50 Remainder over 10 kVA 25~~

~~Informational Note: See 220.14(I) for the calculation of general-use receptacle loads.~~

~~**(B)** Receptacles for Designated Equipment.~~

~~Individual branch circuits supplying receptacles for equipment shall be permitted to be calculated in accordance with Table 517.22(B).~~

~~Table 517.22(B) Demand Factors for Equipment Supplied by Individual Branch Circuits in Health Care Facilities~~

~~Equipment Supplied by Individual Branch Circuits Demand Factor (%) Largest five connected loads 100 Six or more connected loads 50~~

~~Informational Note: See 220.60 for noncoincident load calculations.~~

Statement of Problem and Substantiation for Public Comment

CMP-2 has purview over occupancy-based load calculations as indicated by the NEC Correlating Committee. See actions by CMP-2 on First Revision 9189. This action removes the duplication and potential conflict created by the same demand factor applications being address in both articles 220 and 517.

Related Item

• FR 8222

Submitter Information Verification

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Submittal Date: Wed Aug 18 13:38:11 EDT 2021
Committee: NEC-P15

Public Comment No. 561-NFPA 70-2021 [Section No. 517.22]

517.22 Demand Factors.

Demand factors for general-use receptacles and individual branch circuits not exceeding 150 volts to ground shall be permitted to be applied in accordance with 517.22(A) ~~and~~ , (B) and (C) .

(A) General-Use Receptacles in Category 1 and Category 2 patient care spaces .

In addition to demand factors allowed by other sections of this *Code*, the demand factor for general-use receptacles shall be permitted to be calculated in accordance with Table 517.22(A).

Table 517.22(A) Demand Factors for General-Use Receptacles in ~~Health Care Facilities~~ **Category 1 and Category 2 patient care spaces.**

Portion of Receptacle Load to Which Demand Factor Applies	**Demand Factor (%)**
First 5.0 kVA or less	100
Second 5.0 kVA to 10kVA	50
Remainder ~~over 10 kVA~~ of all other loads	25

Informational Note: See 220.14(I) for the calculation of general-use receptacle loads.

(B) **Dedicated** Receptacles for ~~Designated Equipment~~ Specific Equipment .

Individual branch circuits supplying dedicated receptacles for specific equipment shall be permitted to be calculated in accordance with Table 517.22(B).

Table 517.22(B) Demand Factors for Equipment Supplied by Individual Branch Circuits in Health Care Facilities

Equipment Supplied by Individual Branch Circuits	**Demand Factor (%)**
Largest five connected loads	100
Six or more connected loads	50

Informational Note:

~~See~~

See 220.60 for noncoincident load calculations.

(C) General-Use Receptacles in Category 3 and Category 4 patient care spaces.

Table 517.22 (C) Demand Factors for Non-Dwelling Receptacle Loads

Portion of Receptacle Load to Which Demand Factor Applies (Volt-Amperes)	**Demand Factor (%)**
First 10 kVA or less at	100
Remainder over 10 kVA at	50

Statement of Problem and Substantiation for Public Comment

This comment was generated from discussion with the CMP-2 and CMP-15 task group, but I am not submitting this on behalf of the task group. This represents the consensus of the group that met prior to August 10th. This was submitted to ensure that a comment was made and the discussion can occur at the second draft meeting.

Members of CMP-2 brought up correlation concerns with general / common spaces within healthcare that are not unique to healthcare such as business offices and wanted to ensure that the demand factors for those areas remained the same as any other occupancy. Therefore, the jurisdiction of CMP-15 is only for patient care areas. Per NEC 90.3, The Correlating Committee and the NFPA Standards Council the occupancy chapters may modify or supplement the requirements in the base chapter, but only for unique circumstances. Therefore, CMP-15 does not have the authority to modify requirements that apply to common elements found in all occupancies unless a distinct difference can be identified.

A separate proposal has been submitted that provides a pointer that identifies that demand loads for patient care spaces in health care can be found in Article 517. More common demand factors can still be found in Article 220.

Related Public Comments for This Document

Related Comment	**Relationship**
Public Comment No. 560-NFPA 70-2021 [Section No. 220.48]	PC that includes pointer to this section for Patient Care spaces
Public Comment No. 560-NFPA 70-2021 [Section No. 220.48]	

Related Item

• FR-9189 • FR-8222

Submitter Information Verification

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Submittal Date: Fri Jul 30 12:16:19 EDT 2021
Committee: NEC-P15

Public Comment No. 929-NFPA 70-2021 [Section No. 517.22]

517.22 Demand Factors.

Demand factors for general-use receptacles and individual branch circuits not exceeding 150 volts to ground shall be permitted to be applied in accordance with 517.22(A) and (B).

(A) General-Use Receptacles.

In addition to demand factors allowed by other sections of this *Code*, the demand factor for general-use receptacles shall be permitted to be calculated in accordance with Table 517.22(A).

Table 517.22(A) Demand Factors for General-Use Receptacles in Health Care Facilities

Portion of Receptacle Load to Which Demand Factor Applies	Demand Factor (%)
First 5.0 kVA or less	100
Second 5.0 kVA to 10kVA	50
Remainder over 10 kVA	25

Informational Note: See 220.14(I) for the calculation of general-use receptacle loads.

(B) Receptacles for Designated Equipment.

Individual branch circuits supplying receptacles for equipment shall be permitted to be calculated in accordance with Table 517.22(B).

Table 517.22(B) Demand Factors for Equipment Supplied by Individual Branch Circuits in Health Care Facilities

Equipment Supplied by Individual Branch Circuits	Demand Factor (%)
Largest five connected loads	100
Six or more connected loads	50

Informational Note: See 220.60 for noncoincident load calculations.

Additional Proposed Changes

File Name	Description	Approved
15_CN_179_Detail.pdf	70_CN179	
15_CN_453_Detail.pdf	70_CN453	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 179 appeared in the First Draft Report on First Revision No. 8222.

The Correlating Committee notes that ballot statements on FR 8222 mention the need for establishing purview of load calculations for health care facilities. Under their responsibilities to assign purview, the Correlating Committee (as seen in SCR-39 in the 2020 NEC cycle) established that CMP-2 has purview over general load calculations that are occupancy based throughout the NEC. CMP-2 has responsibilities for load calculations/demand factors and this is reflected in their actions on FR 9189.

For Correlation and to avoid conflicts, the Correlating Committee has established a Task Group with representation from CMP-15 and CMP-2 to work on establishing load calculation demand factors specific to cord- and plug-connected loads as well as demand factors for general purpose receptacles in the healthcare industry (as indicated in the concerns raised by CMP-2 in the statement to FR 9189). The established demand factors should be located in Article 220 as general requirements.

NOTE: The following CC Note No. 453 appeared in the First Draft Report on First Revision No. 8222.

The Correlating Committee notes that ballot statements on FR 8222 continue to mention the need for establishing purview of load calculations for health care facilities. This issue was handled in the 2020 NEC development process with the Correlating Committee establishing that CMP-2 has responsibilities for occupancy-based demand factors and this is reflected in the CMP-2 actions on FR 9189.

For Correlation and to avoid conflicts, the Correlating Committee directs that a TG be formed between CMP-15 and CMP-2 to work on establishing any additional load calculation demand factors specific to cord- and plug-connected loads (as indicated in the concerns raised by CMP-2 in the statement to FR 9189). The established demand factors (if any) should be located in Article 220 as general requirements. This action will be considered as a public comment.

Related Item

• First Revision No. 8222

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
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Submittal Date:	Thu Aug 05 09:21:16 EDT 2021
Committee:	NEC-P15

Correlating Committee Note No. 179-NFPA 70-2021 [Detail]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 12:07:57 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee notes that ballot statements on FR 8222 mention the need for establishing purview of load calculations for health care facilities. Under their responsibilities to assign purview, the Correlating Committee (as seen in SCR-39 in the 2020 NEC cycle) established that CMP-2 has purview over general load calculations that are occupancy based throughout the NEC. CMP-2 has responsibilities for load calculations/demand factors and this is reflected in their actions on FR 9189.

For Correlation and to avoid conflicts, the Correlating Committee has established a Task Group with representation from CMP-15 and CMP-2 to work on establishing load calculation demand factors specific to cord- and plug-connected loads as well as demand factors for general purpose receptacles in the healthcare industry (as indicated in the concerns raised by CMP-2 in the statement to FR 9189). The established demand factors should be located in Article 220 as general requirements.

First Revision No. 8222-NFPA 70-2020 [Detail]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Correlating Committee Note No. 453-NFPA 70-2021 [Detail]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Mon May 10 20:55:14 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee notes that ballot statements on FR 8222 continue to mention the need for establishing purview of load calculations for health care facilities. This issue was handled in the 2020 NEC development process with the Correlating Committee establishing that CMP-2 has responsibilities for occupancy-based demand factors and this is reflected in the CMP-2 actions on FR 9189.

For Correlation and to avoid conflicts, the Correlating Committee directs that a TG be formed between CMP-15 and CMP-2 to work on establishing any additional load calculation demand factors specific to cord- and plug-connected loads (as indicated in the concerns raised by CMP-2 in the statement to FR 9189). The established demand factors (if any) should be located in Article 220 as general requirements. This action will be considered as a public comment.

First Revision No. 8222-NFPA 70-2020 [Detail]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 464-NFPA 70-2021 [New Section after 517.22(B)]

TITLE OF NEW CONTENT

517.23 Cybersecurity, Cyberweapon, Electromagnetic Pulse (EMP), Geomagnetic Disturbance (GMD), and Intentional Electromagnetic Interference (IEMI) Protection. Health care facilities shall comply with either of the following:

(1) The health care facility shall be identified for cybersecurity, cyberweapon, EMP, GMD, and IEMI protection.

(2) A cybersecurity, cyberweapon, EMP, GMD, and IEMI protection failure modes effects analysis assessment shall be conducted to determine health care facility vulnerabilities.

The identification or assessment shall be reviewed when the system configuration changes and at not more than 5-year intervals. Documentation of the identification or assessment shall be made available to those authorized to inspect, operate, and maintain the system.

Statement of Problem and Substantiation for Public Comment

First and foremost, these requirements would be installation requirements, not performance requirements, and therefor fall under the purview of CMP 15, not NFPA 99.

This Public Comment is a follow-up to PI 761, PI 3080, FR 8801, PI 767, PI 3070 and PI 4024. It does not require cybersecurity, cyberweapon, EMP, GMD, or IEMI protection, but rather calls for the health care facility to be identified for these threats or for a threat assessment to be completed. While the NEC® is not ready to mandate protection requirements, an assessment would show system vulnerabilities. Acceptance of this Public Comment would at least bring the subject to the attention of owners, design engineers, electrical inspectors, and insurance companies, and set the table for requirements in future editions of the NEC® (or other NFPA standards). The format for this Public Comment is based upon the cybersecurity requirements found in FR 8801, which offers an assessment as an alternate for requiring protection.

PI 761 provided technical substantiation to require Electromagnetic Pulse (EMP) Protection for our critical infrastructure. While it appears that the NEC(R) is not ready to actually require EMP protection at this time, the security of our country is at stake. An EMP is fairly well understood as an extremely powerful electromagnetic wave that can impress 50,000 volts per meter on every piece of electrical equipment, destroying everything that is unprotected. An EMP is often associated with a nuclear explosion, but that is not the only cause of electromagnetic damage. A Geomagnetic Disturbance (GMD) is caused by a sunspot. While the EMP would be created by one of our adversaries, the sun spot is an act of God. These types of events can instantly initiate millions of fires in our unprotected electrical systems, overwhelming our fire-fighting capabilities. If millions of fires weren't bad enough, the unprotected electrical equipment would be damaged or completely destroyed, subjecting the country to years of blackout. Government intelligence studies, now unclassified, have predicted that from 66% to 90% of our population would die within one year, due to a lack of food, clean water, and medicine, if a significant EMP or GMD were to occur, while the country's electrical infrastructure remains unprotected. The final threat listed is an Intentional Electromagnetic Interference (IEMI). It is easily created by utilizing off-the-shelf parts, available for purchase on the internet, that will fit into a van. While much less powerful than a significant EMP or GMD, twenty vans, equipped with bench-made IEMI devices and scattered throughout the country, can shut down major industries and major parts of the country for weeks, if not months, through a coordinated attack, similar to 9/11, by targeting key industries/vulnerabilities. In conclusion, these electromagnetic threats to our unprotected electrical infrastructure, and therefor to our entire country, are absolutely real, and must be addressed.

PI 4024 provided significant substantiation for the need to protect critical infrastructure against cyber attack for equipment connected to the internet. However, equipment does not need to be connected to the internet in order to be damaged or destroyed by cyber threats. Equipment can be damaged by cyber weapons such as malicious computer worms that attack SCADA (control) systems. A great example is the Stuxnet worm that destroyed the centrifuges in Iran. Thus, this Public Comment deletes the PI 4024 reference to the internet and adds cyberweapon to the list of threats that need to be either protected against or assessed.

Related Item

• PI 767 • PI 3080 • FR 8801 • PI 4024 • PI 3055 • FR 7947 • PI 4026 • FR 8880 • FR 8917 • PI 2888 • FR 8914 • PI 3083 • PI 3070

Submitter Information Verification

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Committee: NEC-P15

Public Comment No. 931-NFPA 70-2021 [Section No. 517.25]

517.25 Essential Electrical Systems for Health Care Facilities.

Type 1 and Type 2 essential electrical systems (EES) for health care facilities shall comprise separate branches capable of supplying a limited amount of lighting and power service, which is considered essential for life safety and orderly cessation of procedures during the time normal electrical service is interrupted for any reason.

Informational Note: SeeNFPA 99-2021, *Health Care Facilities Code*, for information on the need for an essential electrical system.

Additional Proposed Changes

File Name	Description	Approved
15_CN_182.pdf	70_CN182	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 182 appeared in the First Draft Report on First Revision No. 8093.

The Correlating Committee directs that the Panel review the need for the informational note to comply with 3.1.3 of the NEC Style Manual.

Related Item

• First Revision No. 8093

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
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Submittal Date: Thu Aug 05 09:25:00 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 182-NFPA 70-2021 [Section No. 517.25]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 12:40:17 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs that the Panel review the need for the informational note to comply with 3.1.3 of the NEC Style Manual.

First Revision No. 8093-NFPA 70-2020 [Section No. 517.25]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
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Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1692-NFPA 70-2021 [Section No. 517.30]

517.30 Sources of Power.

(A) Two Independent Power Sources.

Essential electrical systems shall have a minimum of the ~~following~~ two independent sources ~~of power: a normal source generally supplying the entire electrical system and one or more alternate sources for use when the normal source is interrupted~~ or sets of sources. One or more sources shall be sized to supply the entire essential electrical electrical system and shall be on-site sources. The second source or sources shall be permitted to be either on-site or off-site . [**99:**6.7.1.1.2]

~~(~~

~~B) Types of Normal~~

C) Power Sources

~~.~~

~~Normal power sources shall be permitted to be any of the following:~~

(1) ~~Utility supply power~~

(2) ~~Generation units~~

(3) ~~Health care microgrid~~

(4) ~~Fuel cells~~

~~**(C)** Types of Alternate Power Sources.~~

~~Alternate power sources~~

for Essential Electrical System.

Power sources for Essential Electrical System shall be permitted to be any of those specified in 517.30(C)(1) through (C)(5).

(1) Utility Supply Power.

~~Where utility power is used as the normal source, utility power shall not be permitted to be used as the alternate source unless permitted elsewhere in this article.~~

~~Informational Note: See 517.35 and 517.45 for essential system loads that can be supplied from dual sources of utility supply power.~~

(2) Generating Units.

~~Where the normal source of power consists of generating units on the premises, the alternate source shall be either another generating set or an external utility service. [**99:** 6.7.1.1.3]~~

(3) Fuel Cell Systems.

Fuel cell systems shall be permitted to serve as the alternate power source for all or part of an essential electrical system. [**99:**6.7.1.5.1]

(a) Installation of fuel cells shall comply with the requirements in Parts I through VII of Article 692 for 1000 volts or less and Part VIII for over 1000 volts.

(b) N + 1 units shall be provided where N units have sufficient capacity to supply the demand load of the portion of the system served.

(c) Systems shall be able to assume loads within 10 seconds of loss of normal power source.

(d) Systems shall have a continuing source of fuel supply, together with sufficient on-site fuel storage for the essential system type.

(e) Where life safety and critical portions of the distribution system are present, a connection shall be provided for a portable diesel generator.

Informational Note: See NFPA 853-2020, *Standard for the Installation of Stationary Fuel Cell Power Systems*, for information on installation of stationary fuel cells.

(4) Energy Storage Systems.

Energy storage systems shall be permitted to serve as the alternate source for all or part of an essential electrical system.

Informational Note: See NFPA 111-2019, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, for information on the installation of energy storage systems.

(5) Health Care Microgrid.

- ~~If health care microgrid power is used as the normal source, health care microgrid power shall not be permitted to be used as the alternate source.~~

Essential electrical systems shall be permitted to be supplied by a health care microgrid that also supplies nonessential loads. The health care microgrid shall be permitted to share distributed resources with the normal system. Health care microgrid systems shall be designed with sufficient reliability to provide effective facility operation consistent with the facility emergency operations plan. Health care microgrid system components shall not be compromised by failure of the normal source.

Informational Note: See NFPA 99-2021, *Health Care Facilities Code, for information on health care microgrids*.

(D) Location of Essential Electrical System Components.

Essential electrical system components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [**99:**6.2.4.1]

(1) Services.

Installation of electrical service distribution equipment shall be located to reduce possible interruption of normal electrical services resulting from natural or manmade causes as well as internal wiring and equipment failures.

(2) Feeders.

Feeders shall be located to provide physical separation of the feeders of the alternate source and from the feeders of the normal electrical source to prevent possible simultaneous interruption. [**99:**6.2.4.3]

Informational Note: Facilities in which the normal source of power is supplied by two or more separate central station-fed services experience greater than normal electrical service reliability than those with only a single feed. Such a dual source of normal power consists of two or more electrical services fed from separate generator sets or a utility distribution network that has multiple power input sources and is arranged to provide mechanical and electrical separation so that a fault between the facility and the generating sources is not likely to cause an interruption of more than one of the facility service feeders.

Statement of Problem and Substantiation for Public Comment

NFPA 99 ELS recognized that there is now no meaningful distinction between a "normal" source and an "essential system" source. The essence of the issue is that some loads - the essential system - must have multiple sources and multiple feeders to ensure reliability of service in the loss of any one source or feeder. And, other loads - the normal system - do not need to have redundancy. The 99 ELS is making a number of important revisions to clarify the needed performance of these various sources to ensure reliable power to essential systems. The changes suggested here are to ensure correlation with NFPA 99.

Related Item

• FR 8237

Submitter Information Verification

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Submittal Date: Tue Aug 17 12:19:55 EDT 2021
Committee: NEC-P15

Public Comment No. 1796-NFPA 70-2021 [Section No. 517.30]

517.30 Sources of Power.

(A) Two Independent Power Sources.

Essential electrical systems shall have a minimum of the following two independent sources of power: a normal source generally supplying the entire electrical system and one or more alternate sources for use when the normal source is interrupted. [**99:**6.7.1.1.2]

(B) Types of Normal Power Sources.

Normal power sources shall be permitted to be any of the following:

(1) Utility supply power

(2) Generation units

(3) Health care microgrid

(4) Fuel cells

(C) Types of Alternate Power Sources.

Alternate power sources shall be permitted to be any of those specified in 517.30(C)(1) through (C)(5).

(1) Utility Supply Power.

Where utility power is used as the normal source, utility power shall not be permitted to be used as the alternate source unless permitted elsewhere in this article.

Informational Note: See 517.35 and 517.45 for essential system loads that can be supplied from dual sources of utility supply power.

(2) Generating Units.

Where the normal source of power consists of generating units on the premises, the alternate source shall be either another generating set or an external utility service. [**99:**6.7.1.1.3]

(3) Fuel Cell Systems.

Fuel cell systems shall be permitted to serve as the alternate power source for all or part of an essential electrical system. [**99:**6.7.1.5.1]

(a) Installation of fuel cells shall comply with the requirements in Parts I through VII of Article 692 for 1000 volts or less and Part VIII for over 1000 volts.

(b) N + 1 units shall be provided where N units have sufficient capacity to supply the demand load of the portion of the system served.

(c) Systems shall be able to assume loads within 10 seconds of loss of normal power source.

(d) Systems shall have a continuing source of fuel supply, together with sufficient on-site fuel storage for the essential system type.

(e) Where life safety ~~and critical portions of~~ , critical and equipment branches of the distribution system ~~are present~~ have fuel cellsinstalled as the alternate source , a perrmanent connection point (quick connect) shall be provided ~~for~~ to allow the connection of a portable diesel generator to back up all 3 branches, without modifying the existing emergency distribution system .

Informational Note: See NFPA 853-2020, *Standard for the Installation of Stationary Fuel Cell Power Systems*, for information on installation of stationary fuel cells.

(4) Energy Storage Systems.

Energy storage systems shall be permitted to serve as the alternate source for all or part of an essential electrical system.

Informational Note: See NFPA 111-2019, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, for information on the installation of energy storage systems.

(5) Health Care Microgrid.

(a) If health care microgrid power is used as the normal source, health care microgrid power shall not be permitted to be used as the alternate source.

(b) Essential electrical systems shall be permitted to be supplied by a health care microgrid that also supplies nonessential loads. The health care microgrid shall be permitted to share distributed resources with the normal system. Health care microgrid systems shall be designed with sufficient reliability to provide effective facility operation consistent with the facility emergency operations plan. Health care microgrid system components shall not be compromised by failure of the normal source.

Informational Note: See NFPA 99-2021, *Health Care Facilities Code, for information on health care microgrids*.

(D) Location of Essential Electrical System Components.

Essential electrical system components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [**99:**6.2.4.1]

(1) Services.

Installation of electrical service distribution equipment shall be located to reduce possible interruption of normal electrical services resulting from natural or manmade causes as well as internal wiring and equipment failures.

(2) Feeders.

Feeders shall be located to provide physical separation of the feeders of the alternate source and from the feeders of the normal electrical source to prevent possible simultaneous interruption. [**99:**6.2.4.3]

Informational Note: Facilities in which the normal source of power is supplied by two or more separate central station-fed services experience greater than normal electrical service reliability than those with only a single feed. Such a dual source of normal power consists of two or more electrical services fed from separate generator sets or a utility distribution network that has multiple power input sources and is arranged to provide mechanical and electrical separation so that a fault between the facility and the generating sources is not likely to cause an interruption of more than one of the facility service feeders.

Statement of Problem and Substantiation for Public Comment

I tried to clean up the language some and added the requirement for provisions to be made for a temp generator to not only back up life safety and critical branches but also the equipment branch, to maintain air distribution and pressures required to minimize the potential for airborne cross contamination within the facility at times when the temp generator is the only available emergency power source.

Related Item

• FR-8237

Submitter Information Verification

Submitter Full Name: Jamie Schnick
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Submittal Date: Tue Aug 17 19:42:39 EDT 2021
Committee: NEC-P15

Public Comment No. 1467-NFPA 70-2021 [Section No. 517.30(B)]

(B) Types of Normal Power Sources.

Normal power sources shall be permitted to be any of the following:

(1) Utility supply power

(2) Generation units

(3) ~~Health care microgrid~~ Microgrids

(4) Fuel cells

Statement of Problem and Substantiation for Public Comment

Replace term with global term in article 100.

This public comment is submitted on behalf of the task group formed under the direction of the Correlating Committee to review all current and proposed definitions and requirements related to microgrids to ensure a clear, consistent, and coordinated approach to addressing this topic throughout the Code.
The task group members are; Jason Fisher Chair, Brenton Michael Fedele, Ted Smith, Isaac Opalinsky, Pete Jackson, Jason Hopkins, John Kovacik, Steven Froemming, Krista Biason, Greg Ball, Chad Beebe, and Matthew Dozier. Through these individual's technical committee memberships, and their balanced interests, this task group provided the expertise to develop these public comments covering microgrids across the NEC.

This public comment is part of a series of actions recommended by the task group. See the related public comments which complete this action.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1469-NFPA 70-2021 [Definition: Health Care Microgrid.]	Deletion of Health Care Microgrid Term
Public Comment No. 1469-NFPA 70-2021 [Definition: Health Care Microgrid.]	
Public Comment No. 1470-NFPA 70-2021 [Section No. 705.50]	

Related Item

• FR-8237

Submitter Information Verification

Submitter Full Name: Jason Fisher
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Submittal Date: Fri Aug 13 17:35:23 EDT 2021
Committee: NEC-P15

Public Comment No. 1468-NFPA 70-2021 [Section No. 517.30(C)(5)]

(5) ~~Health Care Microgrid~~ Microgrids .

(a) If ~~health care microgrid power~~ a microgrid is used as the normal source ~~,~~ for a health care facility, power from the microgrid ~~power~~ shall not be permitted to be used as the alternate source.

(b) Essential electrical systems for a health care facility shall be permitted to be supplied by a ~~health care~~ microgrid that also supplies nonessential loads. The ~~health care~~ microgrid shall be permitted to share distributed resources with the normal system. ~~Health care microgrid systems~~ Microgrid systems for use in health care facilities shall be designed with sufficient reliability to provide effective facility operation consistent with the facility emergency operations plan. ~~Health care microgrid~~ Microgrid system components shall not be compromised by failure of the normal source.

Informational Note: See NFPA 99-2021, *Health Care Facilities Code, for information on ~~health care microgrids~~ . Health Care Microgrids . Microgrids used in these applications are commonly called Health Care Microgrids.*

Statement of Problem and Substantiation for Public Comment

Replacements have been made to use the global term defined in article 100. Added reference to the term Health Care Microgrids in the informational note to highlight that microgrids installed per this article, and other applicable requirements in NFPA-70, will also be commonly referenced in NFPA-99 using a different term. The term “microgrid” remains defined in article 100 and the general requirements for microgrids remain in 705. NFPA-99 and NFPA-70 article 517 give additional constraints on the installation of microgrids to supply health care facilities. This task group further recommends that CMP-15 consider reinforcing the requirements of the separation of systems in the second draft language.
This public comment is submitted on behalf of the task group formed under the direction of the Correlating Committee to review all current and proposed definitions and requirements related to microgrids to ensure a clear, consistent, and coordinated approach to addressing this topic throughout the Code.
The task group members are; Jason Fisher Chair, Brenton Michael Fedele, Ted Smith, Isaac Opalinsky, Pete Jackson, Jason Hopkins, John Kovacik, Steven Froemming, Krista Biason, Greg Ball, Chad Beebe, and Matthew Dozier. Through these individual's technical committee memberships, and their balanced interests, this task group provided the expertise to develop these public comments covering microgrids across the NEC.

This public comment is part of a series of actions recommended by the task group. See the related public comments which complete this action.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 1469-NFPA 70-2021 [Definition: Health Care Microgrid.]	Deletion of Health Care Microgrid Term
Public Comment No. 1469-NFPA 70-2021 [Definition: Health Care Microgrid.]	
Public Comment No. 1470-NFPA 70-2021 [Section No. 705.50]	

Related Item

- FR-8237

Submitter Information Verification

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Committee: NEC-P15

Public Comment No. 92-NFPA 70-2021 [New Section after 517.30(D)]

517.30(C)(6) NETWORK SWITCHES FOR POE EMERGENCY LIGHTING

(1) The switch that serves the emergency egress lighting will be dedicated to emergency egress lighting, no other devices shall be connected to the switch or any other downstream component connected to the network switch.

(2) The switch that serves the emergency egress lighting will be physically separate from all other systems, either in a locked rack or in another space altogether.

(3) The switch shall include a "time to energize" inscription on the nameplate indicating the number of seconds the switch takes to energize and provide power to the light fixtures after power is applied.

(4) The firmware of the switch shall comply with all the following requirements:

(5) The switch shall be designed to prevent Remote Access and Administration. The switch can only be configured through physically connecting to the switch.

(6) The switch should only be allowed software access through a form of Multi-Factor Authentication.

(7) The switch shall be designed such that adding a new device to a downstream connection results in that device not being operational without reconfiguring the switch.

(8) The firmware of the switch should only allow a firmware upgrade of to a new, listed cryptographically signed by the switch manufacturer (minimum of AES-256 bit encryption) firmware version, preventing generic firmware from being applied to the switch.

(9) Informational Note: The reason for the above firmware requirements are to reduce the possibility of an untrained Network Administrator or an untrained Telecommunication installer from accidentally effecting the function of the emergency egress lighting system. Since Network Administrators, Telecommunication installers, and other non-Electrician personal may be adjusting the network topology of the system, frameworks shall be in place within the software of the system to reduce the possibility of accidentally effecting the emergency egress lighting systems.

(10) The wiring to the light fixtures shall meet the requirements of physical separation per this article. The sheething of the wire shall be marked in one of two ways below:

(11) Written indication that it is for emergency egress lighting only marked at the same interval as the listing requirements of the cable;

(12) The cable shall be a different color from all other network cables. The color shall be consistent throughout a facility.

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Additional Proposed Changes

File Name	Description	Approved
NEC_517.30_-_PoE_Network_Switch_-_additional_explination.pdf		

Statement of Problem and Substantiation for Public Comment

With the rapid development of Power over Ethernet (PoE) lighting I am concerned about the code-effects around emergency egress lighting in both hospitals and buildings. I am hoping to provide some guidelines around the minimum requirements for network deployed emergency egress lighting to ensure public safety is maintained as these systems are rapidly deployed.

Please note: I submitted this to the NEC 700.12 section also.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 91-NFPA 70-2021 [New Part after IV.]	Same comment.
Public Comment No. 91-NFPA 70-2021 [New Part after IV.]	

Related Item

• 517.30(C)(6) •

Submitter Information Verification

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Committee:	NEC-P15

To whom it may concern,

With the rapid development of Power over Ethernet (PoE) lighting I am concerned about the code-effects around emergency egress lighting in both hospitals and buildings.

The reason for my concern around these switches is due to the stability of networks from firmware upgrades and configurations. There are many stories over the last several years about network admins misapplying network configurations and taking down portions of the internet, such as the stories below. This is not intended to blame Network Admins, but they are not trained in the NEC and they may not even know what they are affecting. These are only stories because of the scale of the effect, we never hear about the building-wide or office-wide issue in the news.

- 2021-06-08: Internet outage impacts websites and apps around the world: Live updates (cnn.com). From the story: So what exactly happened? Fastly said it had identified a service configuration that triggered disruptions across its servers. The company has disabled that configuration.
  Link: https://edition.cnn.com/world/live-news/internet-outage-websites-apps-world-intl/index.html

- 2020-07-18: Much Of The Internet Went Down Yesterday: Here's The Reason Why (forbes.com). From the story: The outage…was caused by human error. …and the subsequent internet outages, was "a configuration error in our backbone network."
  Link: https://www.forbes.com/sites/daveywinder/2020/07/18/internet-down-human-error-not-cyber-attack-to-blame-says-cloudflare/

- 2016-11-07: BGP errors are to blame for Monday's Twitter outage, not DDoS attacks | CSO Online. From the story: Early Monday morning, an engineer somewhere likely re-configured a router and accidentally removed the path to Twitter.com (AS13414) entirely.
  Link: https://www.csoonline.com/article/3138934/bgp-errors-are-to-blame-for-monday-s-twitter-outage-not-ddos-attacks.html

The intent of this upload is to provide a beginning concept for regulating PoE lighting when it involves emergency egress, life safety, or critical branch power. I understand this is not currently written exactly how code is written, but I am hoping the committee can adjust to make it appropriate.

Thank you for your consideration of this. Please let me know any questions.

Public Comment No. 1799-NFPA 70-2021 [Section No. 517.31(C)(3)]

(3) Mechanical Protection of the Essential Electrical System.

The wiring of the life safety and critical branches shall be mechanically protected by raceways. Where installed as branch circuits in patient care spaces, the installation shall comply with the requirements of 517.13(A) and (B) and 250.118. Only the following wiring methods shall be permitted:

(1) Nonflexible metal raceways, Type MI cable, Type RTRC marked with the suffix –XW, or Schedule 80 PVC conduit. Nonmetallic raceways shall not be used for branch circuits that supply patient care spaces.

(2) Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 PVC conduit, flexible nonmetallic or jacketed metallic raceways, or jacketed metallic cable assemblies listed for installation in concrete. Nonmetallic raceways shall not be used for branch circuits that supply patient care spaces.

(3) Listed flexible metal raceways and listed metal sheathed cable assemblies, as follows:

(4) Where used in listed prefabricated medical headwalls

(5) In listed office furnishings

(6) Where fished into existing walls or ceilings, not otherwise accessible and not subject to physical damage

(7) Where necessary for flexible connection to equipment

(8) For equipment that requires a flexible connection due to movement, vibration, or operation

(9) Luminaires installed in lay-in ceilings and/or ceiling structures (maximum length 6'-0")

(10) Flexible power cords of appliances or other utilization equipment connected to the essential electrical system.

(11) Cables for Class 2 or Class 3 systems permitted in Part VI of this article, with or without raceways.

Informational Note: See 517.13 for additional grounding requirements in patient care areas.

Statement of Problem and Substantiation for Public Comment

It would appear that the intent of the current code is to allow for flexible connection to light fixtures installed in lay-in ceilings, but the wording could have multiple interpretations. Just trying to help clarify, that for life safety and critical branch wiring, listed flexible metal raceways are acceptable. Max length again is added to avoid confusion.

Related Item

• FR8054

Submitter Information Verification

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Submittal Date: Tue Aug 17 19:57:06 EDT 2021
Committee: NEC-P15

Public Comment No. 465-NFPA 70-2021 [New Section after 517.31(G)]

TITLE OF NEW CONTENT

page202image6208

H. Continuity of Service. A selective coordination study of the essential electrical system, completed by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems, shall be documented and made available to the owner and those authorized to design, install, inspect, maintain, and operate the system.

page202image16168

Statement of Problem and Substantiation for Public Comment

While the requirement for selective coordination of the essential electrical system falls within the jurisdiction of NFPA 99 because it is a performance issue, it is not a performance issue to only require that a selective coordination study be completed. By itself, a selective coordination study is for informational purposes only and has absolutely no performance requirements. The study would however educate the owner as to the level of continuity of service that could be expected by the proposed design. If the owner is unhappy with the design because of a potential blackout (that cannot be rectified by switching to other sources), the owner may wish to request that greater continuity of service be designed into the system. Today, the owner is typically never made aware of potential blackout scenarios. Acceptance of this Public Comment would rectify that potentially dangerous situation.

Related Item

- PI 767

Submitter Information Verification

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Submittal Date: Tue Jul 27 18:51:51 EDT 2021
Committee: NEC-P15

Public Comment No. 1800-NFPA 70-2021 [Section No. 517.33]

517.33 Life Safety Branch.

The life safety branch shall be limited to circuits essential to life safety. [**99:**6.7.5.1.2.3]

No functions other than those listed in 517.33(A) through (H) shall be connected to the life safety branch. The life safety branch shall supply power as follows:

(A) Illumination of Means of Egress.

Illumination of means of egress such as lighting required for corridors, passageways, stairways, and landings at exit doors, and all necessary ways of approach to exits. Switching arrangements to transfer patient corridor lighting in hospitals from general illumination circuits to night illumination circuits shall be permitted, if only one of two circuits can be selected and both circuits cannot be extinguished at the same time.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Sections 7.8 and 7.9.

(B) Exit Signs.

Exit signs and exit directional signs.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Section 7.10.

(C) Alarm and Alerting Systems.

Alarm and alerting systems including the following:

(1) Fire alarm systems

(2) Alarm and alerting systems (other than fire alarm systems) shall be connected to the life safety branch or critical branch. [**99:**6.7.5.1.2.5]

(3) Alarms for systems used for the piping of nonflammable medical gases

(4) Mechanical, control, and other accessories required for effective life safety systems operation shall be permitted to be connected to the life safety branch.

(D) Communications Systems.

(1) Hospital communications systems, where used for issuing instructions during emergency conditions. [**99:**6.7.5.1.2.4(3)]

(2) Emergency Response Radio Communication Systems (ERRCS) to support Emergency Response Unit(s) communications. (**IFC** 510.4.2.3)

(E) Generator Set Locations.

Generator set locations as follows:

(1) Task illumination

(2) Battery charger for emergency battery-powered lighting unit(s)

(3) Select receptacles at the generator set location and essential electrical system transfer switch locations

[**99:**6.7.5.1.2.4(4)]

(F) Generator Set Accessories.

Loads dedicated to a specific generator, including the fuel transfer pump(s), ventilation fans, electrically operated louvers, controls, cooling system, and other generator accessories essential for generator operation, shall be connected to the life safety branch or to the output terminals of the generator with overcurrent protective devices. [**99:**6.7.5.1.2.6]

(G) Elevators.

Elevator cab lighting, control, communications, and signal systems. [**99:**6.7.5.1.2.4(5)]

(H) Automatic Doors.

Electrically powered doors used for building egress. [**99:**6.7.5.1.2.4(6)]

Statement of Problem and Substantiation for Public Comment

Requirements for the power supply of Emergency Responder Radio Communication Systems (ERRCS) does not appear to be addressed in current code. As this is a system designed for occupancy safety, the life safety branch appears to be the appropriate source.

Related Item

• FR-8102

Submitter Information Verification

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Submittal Date:	Tue Aug 17 20:09:29 EDT 2021
Committee:	NEC-P15

Public Comment No. 932-NFPA 70-2021 [Section No. 517.34(A)]

(A) Task Illumination, Fixed Equipment, and Selected Receptacles.

The critical branch shall supply power for task illumination, fixed equipment, select receptacles, and select power circuits serving the following spaces and functions related to patient care:

(1) Category 1 spaces where deep sedation or general anesthesia is administered, task illumination, select receptacles, and fixed equipment

(2) Task illumination and select receptacles in the following:

a. Patient care spaces, including infant nurseries, selected acute nursing areas, psychiatric bed areas (omit receptacles), and ward treatment rooms

b. Medication preparation spaces

c. Pharmacy dispensing spaces

d. Nurses' stations — unless adequately lighted by corridor luminaires

(3) Additional specialized patient care task illumination and receptacles, where needed

(4) Nurse call systems

(5) Blood, bone, and tissue banks

(6) Telecommunications entrance facility, telecommunications equipment rooms, and telecommunication rooms and equipment in these rooms

(7) Task illumination, select receptacles, and select power circuits for the following areas:

a. Category 1 or 2 spaces with at least one duplex receptacle per patient bed location, and task illumination as required by the governing body of the health care facility

b. Angiographic labs

c. Cardiac catheterization labs

d. Coronary care units

e. Hemodialysis rooms or areas

f. Emergency room treatment areas (select)

g. Human physiology labs

h. Intensive care units

i. Postoperative recovery rooms (select)

(8) Clinical IT-network equipment

(9) Wireless phone and paging equipment for clinical staff communications

(10) Additional task illumination, receptacles, and select power circuits needed for effective facility operation, including single-phase fractional horsepower motors, which are permitted to be connected to the critical branch

[**99:**6.7.5.1.3.2]

Additional Proposed Changes

File Name	Description	Approved
15_CN_183.pdf	70_CN183	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 183 appeared in the First Draft Report on First Revision No. 8125.

The Correlating Committee directs that the Panel review and reconsider the revision involving the term "selected receptacles" as this is a specifically defined term in Article 100. Changing it to "select receptacles" could cause confusion.

Related Item

• First Revision No. 8125

Submitter Information Verification

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Submittal Date:	Thu Aug 05 09:27:14 EDT 2021
Committee:	NEC-P15

Correlating Committee Note No. 183-NFPA 70-2021 [Section No. 517.34(A)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 12:48:38 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs that the Panel review and reconsider the revision involving the term “selected receptacles” as this is a specifically defined term in Article 100. Changing it to “select receptacles” could cause confusion.

First Revision No. 8125-NFPA 70-2020 [Section No. 517.34(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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 2207-NFPA 70-2021 [Section No. 517.35(A)]

(A) Equipment for Delayed Automatic Connection.

The following equipment shall be permitted to be arranged for delayed automatic connection to the alternate power source:

(1) Central suction systems serving medical and surgical functions, including controls, with such suction systems permitted to be placed on the critical branch

(2) Sump pumps and other equipment required to operate for the safety of major apparatus, including associated control systems and alarms

(3) Compressed air systems serving medical and surgical functions, including controls with such air systems permitted to be placed on the critical branch

(4) Smoke control and stair pressurization systems, with such systems permitted to be placed on the life safety branch. INFORMATIONAL NOTE: See NFPA 92-2018, Standard for Smoke Control Systems, Section 6.4.5.3

(5) Kitchen hood supply or exhaust systems, or both, if required to operate during a fire in or under the hood

(6) Supply, return, and exhaust ventilating systems for the following:

(7) Airborne infectious/isolation rooms

(8) Protective environment rooms

(9) Exhaust fans for laboratory fume hoods

(10) Nuclear medicine areas where radioactive material is used

(11) Ethylene oxide evacuation

(12) Anesthetic evacuation

[99:6.7.5.1.4.3(A)]

Where delayed automatic connection is not appropriate, the ventilation systems specified in 517.35(A)(6) shall be permitted to be placed on the critical branch. **[99:**6.7.5.1.4.3(B)]

(13) Supply, return, and exhaust ventilating systems for operating and delivery rooms

(14) Supply, return, exhaust ventilating systems and/or air-conditioning systems serving telephone equipment rooms and closets and data equipment rooms and closets, such systems shall be permitted to be connected to the critical branch

Exception: Sequential delayed automatic connection to the alternate power source to prevent overloading the generator shall be permitted where engineering studies indicate it is necessary.

(9) Fire Suppression Jockey Pump, with such equipment permitted to be placed on the life safety branch

Statement of Problem and Substantiation for Public Comment

For the first revision: The primary purpose of the life safety branch is to power devices, equipment, alarms, and other systems that allow and help the building occupants evacuate safely. Smoke control and stair pressurization systems are only powered and used during a fire and/or partial/full building evacuation. These systems & equipment should be permitted to be circuited to the life safety branch for this reason. Being on the equipment branch can pose a number of problems if these systems are not on a priority 1 equipment automatic transfer switch. Priority 1 is defined as being connected to a live generator bus within 10 seconds and also be a non-sheddable load. Equipment branches can be shed by the generator or the paralleling switchgear if a generator overloads or fails. This is especially problematic if there is a fire or explosion in the building that causes the need for both a generator shutdown and the need to power on the smoke control system and/or stair pressurization fans. The second issue is that not all equipment branches are designed to be on with 10 seconds or even 60 seconds, which is the time duration specified by NFPA 92-2018 6.4.5.3 that smoke control fan equipment are required to be on and working. These systems and equipment should be powered within 10 seconds and be non-sheddable which can be done either by circuiting to the life safety branch ATS or a priority 1 equipment branch ATS. Adding smoke controls and stair pressurization systems to the life safety branch will only add load to the generator while operating, which is when the building will need it the most.

For the second revision: Damage to IT room equipment, which are vital to a hospital's effective operation, can occur quickly if the A/C in the room goes out. While A/C equipment is permitted to be connected to the equipment branch, this approach can cause problems if the equipment branch ATS does not connect automatically in a reasonable amount of time or the equipment branch is shed from the generator. It also makes sense to be able to run IT A/C systems from the same branch of power that the room equipment is fed from itself. If the A/C system is on a different branch of power than the IT room equipment, now the IT room is dependent on two branches of power to function correctly and sustainably. Motors are permitted on the critical branch if the motor is fractional horsepower, however, there are times when the motor or compressor for the IT room A/C equipment is bigger than a fractional horsepower motor and is therefore no longer permitted to be on the critical branch. Specifically permitting IT A/C systems on the critical branch solves these issues, the biggest of which is IT rooms' dependency on two different branches of power to function properly.

For the third revision: NFPA 99 6.7.5.1.5 lists the jockey pump as a load that is not permitted to be shed from the generator. Similar to the first proposed revision, this the jockey pump supports the fire pump, which is essential for fire suppression and occupant evacuation. Right now the code only allows it to be on a priority 1 (as defined above) equipment branch. It should be permitted to be on the life safety branch since that branch is a non-sheddable switch and it supports equipment that is essential for fire suppression and building evacuation.

For one and three above, a non-sheddable equipment branch in addition to or lieu of a sheddable equipment branch may not be feasible

for a healthcare facility due to cost, building space constraints, and/or non-sheddable capacity on a generator system.

Related Item

• PC-2207-NFPA 70-2021

Submitter Information Verification

Submitter Full Name: Christopher Bond
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Submittal Date: Thu Aug 19 16:41:40 EDT 2021
Committee: NEC-P15

Public Comment No. 1694-NFPA 70-2021 [Section No. 517.41]

517.41 Required Power Sources.

(A) Two Independent Power Sources.

Essential electrical systems shall have a minimum of ~~the following~~ two independent sources ~~of power: a normal source generally supplying the entire electrical system and one or more alternate sources for use when the normal source is interrupted.~~
[**99:** ~~6.7.1.2.2~~]

~~**(B)** Types of Power Sources.~~

~~Where the normal source consists of generating units on the premises, the alternate power source shall be either another generating set or an external utility service.~~ or sets of sources. One or more sources shall be sized to supply the entire essential electrical system and shall be on-site sources. The second source or sources shall be permitted to be either on-site or off-site.
[**99:**6.7.1.1.3 2]

(C) Location of Essential Electrical System Components.

Essential electrical system components shall be located to minimize interruptions caused by natural forces common to the area (e.g., storms, floods, earthquakes, or hazards created by adjoining structures or activities). [**99:**6.2.4.1]

Installations of electrical services shall be located to reduce possible interruption of normal electrical services resulting from similar causes as well as possible disruption of normal electrical service due to internal wiring and equipment failures. [**99:**6.2.4.2]

Feeders shall be located to provide physical separation of the feeders of the alternate source and from the feeders of the normal electrical source to prevent possible simultaneous interruption. [**99:**6.2.4.3]

Statement of Problem and Substantiation for Public Comment

NFPA 99 ELS made important revisions to the issue of sources for normal and essential system loads. These changes recognize that there is no distinction between kinds of sources. The critical distinction is that normal loads do not need multiple sources and essential system loads DO require multiple sources to ensure adequate reliability. The suggested change here is to correlate precisely with the changes in 99.

Related Item

• FR 8149

Submitter Information Verification

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Submittal Date: Tue Aug 17 12:34:00 EDT 2021
Committee: NEC-P15

Public Comment No. 1802-NFPA 70-2021 [Section No. 517.43]

517.43 Automatic Connection to Life Safety and Equipment Branch.

The life safety and equipment branches shall be installed and connected to the alternate source of power specified in 517.41 so that all functions specified herein for the life safety and equipment branches are automatically restored to operation within 10 seconds after interruption of the normal source. [**99:**6.7.6.4.1]

No functions other than those listed in 517.43(A) through (G) shall be connected to the life safety branch. [**99:**6.7.6.2.1.5(D)]

The life safety branch shall supply power as follows:

(A) Illumination of Means of Egress.

Illumination of means of egress as is necessary for corridors, passageways, stairways, landings, and exit doors and all ways of approach to exits. Switching arrangement to transfer patient corridor lighting from general illumination circuits shall be permitted if only one of two circuits can be selected and both circuits cannot be extinguished at the same time.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Sections 7.8 and 7.9.

(B) Exit Signs.

Exit signs and exit directional signs.

Informational Note: See NFPA *101*-2021, *Life Safety Code*, Section 7.10.

(C) Alarm and Alerting Systems.

Alarm and alerting systems, including the following:

(1) Fire alarms

Informational Note No. 1: See NFPA *101*-2021, *Life Safety Code*, Sections 9.6 and 18.3.4.

(2) Alarms required for systems used for the piping of nonflammable medical gases

Informational Note No. 2: See NFPA 99-2021, *Health Care Facilities Code*, 6.7.5.1.2.5.

(D) Communications Systems.

(1) Communications systems, where used for issuing instructions during emergency conditions. [**99:**6.7.5.1.2.4(3)]

(2) Emergency Response Radio Communication Systems (ERRCS), to support emergency response unit(s) communications (**IFC** 510.4.2.3)

(E) Generator Set Location.

Task illumination and select receptacles at the generator set location and essential electrical system transfer switch locations.

(F) Elevators.

Elevator cab lighting, control, communications, and signal systems. [**99:**6.7.5.1.2.4(5)]

(G) AC Equipment for Nondelayed Automatic Connection.

Generator accessories, including, but not limited to, the transfer fuel pump, electrically operated louvers, and other generator accessories essential for generator operation shall be arranged for automatic connection to the alternate power source. [**99:**6.7.6.2.1.6(C)]

Statement of Problem and Substantiation for Public Comment

Power source for Emergency Radio Response Communications System (ERRCS) does not appear to be covered in the code. Since the ERRCS is related to public safety it appears that the life safety branch is best choice.

Related Item

• FR-8110

Submitter Information Verification

Submitter Full Name: Jamie Schnick
Organization: OSHPD
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 20:25:13 EDT 2021
Committee: NEC-P15

Public Comment No. 1024-NFPA 70-2021 [Section No. 517.70]

517.70 Applicability.

Nothing in this part shall be construed as specifying safeguards against possible radiation or magnetic fields.

Informational Note No. 1: Radiation safety and performance requirements of several classes of X-ray equipment are regulated under Public Law 90-602 and are enforced by the Department of Health and Human Services.

Informational Note No. 2: Information on radiation protection by the National Council on Radiation Protection and Measurements is published as *Reports of the National Council on Radiation Protection and Measurement*. These reports are obtainable from NCRP Publications, P.O. Box 30175, Washington, DC 20014.

Informational Note No. 3: Diagnostic imaging equipment includes, but is not limited to, the following:

(1) General radiographic (X-ray) equipment (mobile and fixed)
(2) General fluoroscopic equipment (mobile and fixed)
(3) Interventional equipment (mobile and fixed)
(4) Bone mineral density equipment
(5) Dental equipment
(6) Computerized tomography (CT) equipment
(7) Positron emission tomography (PET) equipment
(8) Nuclear medicine equipment
(9) Mammography equipment
(10) Magnetic resonance (MR) equipment
(11) Diagnostic ultrasound equipment
(12) Electrocardiogram equipment

Informational Note No. 4: Treatment equipment includes, but is not limited to, the following:

(1) Linear accelerators
(2) Gamma knife
(3) Cyber knife
(4) Proton therapy
(5) Tomotherapy

Additional Proposed Changes

File Name	Description	Approved
15_CN_192_Global.pdf	70_CN192	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 192 appeared in the First Draft Report on First Revision No. 8234.

The Correlating Committee requests the Panel to consider including the term "examples of' in the lead in sentence to the list in Informational Notes No. 3 and 4 to comply with NEC Style Manual 3.1.3.

Related Item

• First Revision No. 8234

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 20:03:01 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 192-NFPA 70-2021 [Global Input]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:47:30 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee requests the Panel to consider including the term "examples of" in the lead in sentence to the list in Informational Notes No. 3 and 4 to comply with NEC Style Manual 3.1.3.

First Revision No. 8234-NFPA 70-2020 [Global Input]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1417-NFPA 70-2021 [Section No. 517.70]

517.70 Applicability.

Nothing in this part shall be construed as specifying safeguards against possible radiation or magnetic fields.

Informational Note No. 1: Radiation safety and performance requirements of several classes of X-ray equipment are regulated under Public Law 90-602 and are enforced by the Department of Health and Human Services.

Informational Note No. 2: Information on radiation protection by the National Council on Radiation Protection and Measurements is published as *Reports of the National Council on Radiation Protection and Measurement*. These reports are obtainable from NCRP Publications, P.O. Box 30175, Washington, DC 20014.

Informational Note No. 3: Diagnostic imaging equipment ~~includes~~ can include , but is not limited to, the following:

(1) General radiographic (X-ray) equipment (mobile and fixed)
(2) General fluoroscopic equipment (mobile and fixed)
(3) Interventional equipment (mobile and fixed)
(4) Bone mineral density equipment
(5) Dental equipment
(6) Computerized tomography (CT) equipment
(7) Positron emission tomography (PET) equipment
(8) Nuclear medicine equipment
(9) Mammography equipment
(10) Magnetic resonance (MR) equipment
(11) Diagnostic ultrasound equipment
(12) Electrocardiogram equipment

Informational Note No. 4: Treatment equipment ~~includes~~ can include , but is not limited to, the following:

(1) Linear accelerators
(2) Gamma knife
(3) Cyber knife
(4) Proton therapy
(5) Tomotherapy

Statement of Problem and Substantiation for Public Comment

Certainly not everything in the list is diagnostic imaging equipment. Item 5, for example, is dental equipment. I would say at least 95 percent of the equipment in a dental office is NOT diagnostic imaging equipment.

Related Item

• FR 8234

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
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City:
State:
Zip:
Submittal Date: Thu Aug 12 16:18:28 EDT 2021
Committee: NEC-P15

Public Comment No. 1696-NFPA 70-2021 [Section No. 517.73]

517.73 Rating of Supply Conductors and Overcurrent Protection.

(A) Branch Circuits.

The ampacity of supply branch-circuit conductors and the current rating of overcurrent protective devices shall not be less than 50 percent of the momentary rating or 100 percent of the long-time rating, whichever is greater.

(B) Feeders.

The ampacity of supply feeders and the current rating of overcurrent protective devices supplying two or more branch circuits supplying diagnostic imaging and treatment equipment shall not be less than 50 percent of the momentary demand rating of the largest unit, plus ~~10 percent~~ 25 percent of the momentary demand rating of the next largest unit, plus ~~5 percent~~ 10 percent of the momentary demand rating of each additional unit.

Informational Note No. 1: The minimum conductor size for branch and feeder circuits is also governed by voltage regulation requirements. For a specific installation, the manufacturer usually specifies minimum distribution transformer and conductor sizes, rating of disconnecting means, and overcurrent protection.

Informational Note No. 2: The ampacity of the branch-circuit conductors and the ratings of disconnecting means and overcurrent protection for diagnostic imaging and treatment equipment are usually designated by the manufacturer for the specific installation.

Statement of Problem and Substantiation for Public Comment

I was the proposer of this change during the Public Input stage. We have a grant from ASHRAE and another from the University of California to study this issue. We are working in conjunction with statisticians at Laurence Berkeley National Laboratories on the study. We expected that the study would be complete by now to allow us to justify these changes. However, the pandemic derailed the study, and it is only now getting underway. Therefore, we do NOT have the data to support the originally suggested change, and this should be held until the next cycle, when we have the data and analysis completed.

Related Item

• FR 8234

Submitter Information Verification

Submitter Full Name: Walter Vernon
Organization: Mazzetti
Street Address:
City:
State:
Zip:
Submittal Date: Tue Aug 17 12:45:11 EDT 2021
Committee: NEC-P15

Public Comment No. 1015-NFPA 70-2021 [Section No. 518.2(C)]

(C) Theatrical Areas.

Where any such building structure, or portion of a building structure, contains a projection booth or stage platform or area for the presentation of theatrical or musical productions, either fixed or portable, the wiring for that area, including associated audience seating areas, and all equipment that is used in the referenced area, and portable equipment and wiring for use in the production that will not be connected to permanently installed wiring, shall comply with Article 520.

Informational Note: See the local building code or, in its absence, NFPA *101*-2021, *Life Safety Code*, for methods of determining population capacity.

Additional Proposed Changes

File Name	Description	Approved
15_CN_184.pdf	70_CN184	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 184 appeared in the First Draft Report on First Revision No. 8180.

The Correlating Committee directs that the Panel review the revised text in FR - 8180 for clarity and usability relative to use of two defined terms in sequence in this requirement. The terms "building" and "structure" are both defined in Article 100. The CC suggests considering the use of the word "or" between them as a possible solution.

Related Item

- First Revision No. 8180

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 19:36:56 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 184-NFPA 70-2021 [Section No. 518.2(C)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 12:56:38 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs that the Panel review the revised text in FR – 8180 for clarity and usability relative to use of two defined terms in sequence in this requirement. The terms “building” and “structure” are both defined in Article 100. The CC suggests considering the use of the word “or” between them as a possible solution.

First Revision No. 8180-NFPA 70-2020 [Section No. 518.2(C)]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 2223-NFPA 70-2021 [Section No. 518.5]

518.5 Supply.

~~Portable switchboards and portable power distribution equipment shall be supplied only from listed power outlets of sufficient voltage and ampere rating. Such power outlets shall~~ **(A) Power Outlet and Commercial Appliance Outlet Centers.**

Power outlets and commecial appliance outlet centers shall provide overcurrent protection or shall be protected by overcurrent devices. Such overcurrent devices ~~and~~ , power outlets, and commercial appliance outlet centers shall not be accessible to the general public. ~~Provisions for connection~~ Connection means of an equipment grounding conductor shall be provided in power outlets and commercial appliance outlet centers . A panelboard installed in a listed commercial appliance outlet center enclosure designed for in-floor mounting shall be permitted to be oriented in the face-up position.

(B) Neutral Conductor of Feeders.

The neutral conductor of feeders supplying solid-state phase-control, 3-phase, 4-wire dimmer systems shall be considered a current-carrying conductor for purposes of ampacity adjustment. The neutral conductor of feeders supplying solid-state sine-wave, 3-phase, 4-wire dimming systems shall not be considered a current-carrying conductor for purposes of ampacity adjustment.

Exception: The neutral conductor of feeders supplying systems that use or are capable of using both phase-control and sine-wave dimmers shall be considered as current-carrying for purposes of ampacity adjustment.

Informational Note: See 520.2 definitions of solid-state dimmer types.

(C) Portable Switchboards and Portable Power Distribution Equipment.

Portable switchboards and portable power distribution equipment shall be supplied only from listed power outlets or listed commercial appliance outlet centers, each having sufficient voltage and ampere ratings.

Statement of Problem and Substantiation for Public Comment

I am requesting reconsideration of resolved Public Input No. 1761-NFPA 70-2020 [Section No. 518.5] in light of explicit direction provided specifically by CMP-9 Panel Statements on First Revision No. 7944-NFPA 70-2020 [Section No. 408.43] and Public Input No. 1705-NFPA 70-2020 [Section No. 408.43] to address panelboard orientation in the Special Occupancy Chapter 5 Article 518 rather than in the :General Chapter 4 Article 408, in accordance with 90.3:

.

"CMP-9 acknowledges that conditions within special occupancies such as those in Article 518 may warrant a modification to this general rule. PI-1761 may accomplish this and is under the purview of CMP-15."

.

Restating the Substantiation for Public Input No. 1761-NFPA 70-2020 [Section No. 518.5] :

New 2020 NEC® Section 408.43, in conjunction with the Article 100 Panelboard definition as worded (“accessible only from the front”), has had in some jurisdictions the consequence of potentially disallowing a long-existing, listed product type: in-floor-mounted commercial appliance outlet centers, composed of factory- or field-installed panelboards and commercial appliance outlet center enclosures. Because of the generalizations of this new 2020 NEC® Section 408.43, it is essential to recognize explicitly these in-floor-mounted commercial appliance outlet centers having face-up panelboards accessed from the top.

.

The definition for “Panelboard” in Article 100 is indicated as being “designed to be placed in a cabinet”. For assembly occupancies such as convention centers, exhibition halls, casinos, gaming facilities, et alibi (as well as non-assembly occupancies such as hotels and warehouses), commercial appliance outlet centers are listed to receive factory- or field-installed panelboards and are listed for in-floor mounting in large facilities and venues (not all assembly occupancies), to supply electrical power and other services. Such listed commercial appliance outlet centers and listed commercial appliance outlet center enclosures that provide for diversion and routing of water spillage away from face-up panelboards installed flat or slightly angled within and for adequate drainage, and can be found in UL Product Category AUUZ.

.

Editorially, the existing Section contained a variety of requirement that have been divided into titled Subsections for Code usability. The first sentence has been relocated, with the addition of commercial appliance outlet centers, to a new Subsection C addressing the supply of portable switchboards and portable power distribution equipment. The requirement is essentially unchanged.

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The final two sentences of the existing Section, plus the associated Exception and associated Informational Note, have been divided into a new titled Subsection B. Beyond the division into a new Subsection, there are no revisions of these sentences whatsoever.

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The remaining sentences of existing 518.5 are located in Subsection A, This Subsection reflects explicitly the inclusion of commercial appliance outlet centers and that panelboards can be installed with a face-up orientation into in-floor-mounted, contrary to new 2020 NEC® Section 408.43, despite long-standing usage, design, and listing evaluation for such equipment in assembly occupancy venues. Furthermore, the new wording now recognizes explicitly that some power outlets or commercial appliance outlet centers “upstream” may contain the overcurrent protection for power outlets or commercial appliance outlet centers “downstream”.

Related Item

- Public Input No. 1761-NFPA 70-2020 [Section No. 518.5]
- First Revision No. 7944-NFPA 70-2020 [Section No. 408.43]
- Public Input No. 1705-NFPA 70-2020 [Section No. 408.43]

Submitter Information Verification

Submitter Full Name: Brian Rock

Organization:	Hubbell Incorporated
Street Address:	
City:	
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Submittal Date:	Thu Aug 19 17:57:27 EDT 2021
Committee:	NEC-P15

Public Comment No. 10-NFPA 70-2021 [Section No. 520.21]

520.21 General.

Fixed stage switchboards shall comply with 520.21(1) through (4 5):

(1) Fixed stage switchboards shall be listed.

(2) Fixed stage switchboards shall be readily accessible but shall not be required to be located on or adjacent to the stage. Multiple fixed stage switchboards shall be permitted at different locations.

(3) A fixed stage switchboard shall contain overcurrent protective devices for all branch circuits supplied by that switchboard.

(4) A fixed stage switchboard shall be permitted to supply both stage and non-stage equipment.

(5) Fixed stage switchboards shall comply with the marking and working space requirements in 408.18(C) but shall not be required to comply with the load terminal location requirements in 408.18(C)(1), (C)(2), and (C)(3).

Statement of Problem and Substantiation for Public Comment

As of June 29, 2021 TIA 1573 had passed final ballot with CMP15 and the Correlating Committee. It is awaiting Standards Council approval. I am submitting this public comment, which is a duplicate of TIA 1573, to insure that the contents of TIA 1573 are included in the Second Revision. The TIA 1573 Substantiation is also included below.

408.18(c) 1, 2, and 3 were added to the NEC in the 2020 edition. The purpose of these sections was to minimize the risk of shock and/or arc flash when making or modifying connections to an energized switchboard. Typical listed stage switchboards covered by 520.21 are high-density units containing dead-front dimmer or relay modules that plug onto busbars and load circuit connectors. They are not general-purpose switchboards, but special-purpose switchboards covered by the UL334 Outline of Investigation for Theater Lighting Distribution and Control Equipment. This document in turn requires certain, but not all, portions of the UL891 Standard for Switchboards to be applied to these devices. 1. The listing conditions of these devices prohibit work of any kind on connections while the switchboard is energized. This prohibition is part of the warnings and instructions for the switchboard. 2. From a practical point of view, the construction of these units does not physically allow for wiring changes while energized due to their high density of busbars and load connections. 3. Even if it were practically possible or allowed by the switchboard listing, which it is not, there is no plausible use case for a stage switchboard where work on connections would be required while the switchboard remained energized. 4. There is no practical way to modify the design of these products to comply with 408.18(C) 1, 2, and 3. 5. Similar constructions from multiple manufacturers have been in safe use for more than 40 years. None of these constructions could likely comply with 408.18(C) 1, 2, or 3. Those requirements are aimed at general-purpose switchboards and their use cases that require modification of connections while the switchboard is energized. Such use cases do not apply to stage switchboards.

Related Item

• TIA 1573

Submitter Information Verification

Submitter Full Name: Steven Terry
Organization: Electronic Theatre Controls Inc
Affiliation: US Institute for Theatre Technology
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 29 12:11:48 EDT 2021
Committee: NEC-P15

Public Comment No. 1016-NFPA 70-2021 [Section No. 520.25(A)]

(A) Disconnection and Overcurrent Protection.

Where dimmers are installed in ungrounded conductors, each dimmer shall have overcurrent protection not greater than 125 percent of the dimmer rating and shall be disconnected from all ungrounded conductors where the master or individual switch or circuit breaker supplying such dimmer is in the open position.

Additional Proposed Changes

File Name	Description	Approved
15_CN_185.pdf	70_CN185	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 185 appeared in the First Draft Report on First Revision No. 8183

The Correlating Committee directs that the Panel reconsider the revised text with respect to the use of the word "where". It would appear that either "if" or "when" would be better suited for this location in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition)

Related Item

- First Revision No. 8183

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 19:38:36 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 185-NFPA 70-2021 [Section No. 520.25(A)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:03:57 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs that the Panel reconsider the revised text with respect to the use of the word “where”. It would appear that either "if" or "when" would be better suited for this location in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition)

First Revision No. 8183-NFPA 70-2020 [Section No. 520.25(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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 12-NFPA 70-2021 [Section No. 520.53]

520.53 Construction.

Portable stage switchboards shall be listed and shall comply with 520.53(A) through (E). The load terminal locati on requirements in 408.18(C)(1), (C)(2), and (C)(3) shall not apply to portable stage switchboards.

(A) Pilot Light.

A pilot light shall be provided for each ungrounded conductor feeding the switchboard. The pilot light(s) shall be connected to the incoming feeder so that operation of the main overcurrent protective device or master switch shall not affect the operation of the pilot light(s).

(B) Neutral Terminal.

In portable switchboard equipment designed for use with 3-phase, 4-wire with ground supply, the current rating of the supply neutral terminal, and the ampacity of its associated busbar or wiring, or both, shall have an ampacity equal to at least twice the ampacity of the largest ungrounded supply terminal.

Exception: Where portable switchboard equipment is specifically constructed and identified to be internally converted in the field, in an approved manner, from use with a balanced 3-phase, 4-wire with ground supply to a balanced single-phase, 3-wire with ground supply, the supply neutral terminal and its associated busbar, wiring, or both, shall have an ampacity equal to at least that of the largest ungrounded single-phase supply terminal.

(C) Single-Pole Separable Connectors.

Single-pole separable connectors shall comply with 406.13. Sections 400.14, 406.7, and 406.8 shall not apply to listed single-pole separable connectors and single-conductor cable assemblies utilizing listed single-pole separable connectors. Where paralleled sets of current-carrying, single-pole separable connectors are provided as input devices, they shall be prominently labeled with a warning indicating the presence of internal parallel connections.

(D) Supply Feed-Through.

Where a portable stage switchboard contains a feed-through outlet of the same rating as its supply inlet, the feed-through outlet shall not require overcurrent protection in the switchboard.

(E) Interior Conductors.

All conductors other than busbars within the switchboard enclosure shall be stranded.

Statement of Problem and Substantiation for Public Comment

As of June 29, 2021 TIA 1574 had passed final ballot with CMP15 and the Correlating Committee. It is awaiting Standards Council approval. I am submitting this public comment, which is a duplicate of TIA 1574, to insure that the contents of TIA 1574 are included in the Second Revision. The TIA 1574 Substantiation is also included below.

408.18(c) 1, 2, and 3 were added to the NEC in the 2020 edition. The purpose of these sections was to minimize the risk of shock and/or arc flash when making or modifying connections to an energized switchboard. Typical listed stage switchboards covered by 520.53 are high-density units containing dead-front dimmer or relay modules that plug onto busbars and load circuit connectors. They are not general-purpose switchboards, but special-purpose switchboards covered by the UL334 Outline of Investigation for Theater Lighting Distribution and Control Equipment. This document in turn requires certain, but not all, portions of the UL891 Standard for Switchboards to be applied to these devices. 1. The listing conditions of these devices prohibit work of any kind on connections while the switchboard is energized. This prohibition is part of the warnings and instructions for the switchboard. 2. From a practical point of view, the construction of these units does not physically allow for wiring changes while energized due to their high density of busbars and load connections. 3. Even if it were practically possible or allowed by the switchboard listing, which it is not, there is no plausible use case for a stage switchboard where work on connections would be required while the switchboard remained energized. 4. There is no practical way to modify the design of these products to comply with 408.18(C) 1, 2, and 3. 5. Similar constructions from multiple manufacturers have been in safe use for more than 40 years. None of these constructions could likely comply with 408.18(C) 1, 2, or 3. Those requirements are aimed at general-purpose switchboards and their use cases that require modification of connections while the switchboard is energized. Such use cases do not apply to stage switchboards.

Related Item

• TIA 1574

Submitter Information Verification

Submitter Full Name: Steven Terry
Organization: Electronic Theatre Controls Inc
Affiliation: US Institute for Theatre Technology
Street Address:
City:
State:
Zip:
Submittal Date: Tue Jun 29 12:21:21 EDT 2021

Committee: NEC-P15

Public Comment No. 1017-NFPA 70-2021 [Section No. 520.68(A)(4)]

(4) Luminaire Supply Cords.

Listed hard usage supply cords shall be permitted to supply luminaires where all of the following conditions are met:

(1) The supply cord is not longer than 2.0 m (6.6 ft).

(2) The supply cord is attached at one end to the luminaire or a luminaire-specific listed connector that mates with a panel-mounted inlet on the body of the luminaire.

(3) The supply cord is protected by an overcurrent protective device of not more than 20 amperes.

(4) The luminaire is listed.

(5) The supply cord is not subject to physical damage.

Additional Proposed Changes

File Name	Description	Approved
15_CN_186.pdf	70_CN186	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 186 appeared in the First Draft Report on First Revision No. 8186.

The Correlating Committee directs the Panel to reconsider the revised text with respect to the use of the word "where" as compared to the word "if' in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition)

Related Item

• First Revision No. 8186

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 19:40:00 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 186-NFPA 70-2021 [Section No. 520.68(A)(4)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:09:56 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to reconsider the revised text with respect to the use of the word “where” as compared to the word “if” in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition)

First Revision No. 8186-NFPA 70-2020 [Section No. 520.68(A)(4)]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1019-NFPA 70-2021 [Section No. 520.68(D)]

(D) Special-Purpose Multi-Circuit Cable Systems.

Special-purpose multi-circuit cable systems shall comply with the following requirements:

(1) Branch circuits shall be rated at not more than 20 amperes and not more than 150 volts to ground.

(2) Trunk cable types shall be extra-hard usage (hard service) or hard usage (junior hard service).

(3) The ampacity of trunk cables shall be determined in accordance with Table 520.44(C)(2).

(4) Trunk cables, breakout assemblies, and multi-circuit enclosures shall be listed.

(5) Section 406.8 shall not apply to multi-circuit, multipole plugs or receptacles that are part of a special-purpose multi-circuit cable system.

(6) All multi-circuit, multipole connectors shall be clearly marked with the voltage of the branch circuits serviced by the connector.

(7) Installation and operation shall be performed by qualified personnel.

Additional Proposed Changes

File Name	Description	Approved
15_CN_187.pdf	70_CN187	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 187 appeared in the First Draft Report on First Revision No. 8007.

The Correlating Committee directs the Panel to reconsider the text in item (7) to consider the defined term "qualified person" relative to the installation to align with Article 100.

Related Item

• First Revision No. 8007

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 19:41:32 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 187-NFPA 70-2021 [New Section after 520.68(C)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:12:16 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to reconsider the text in item (7) to consider the defined term "qualified person" relative to the installation to align with Article 100.

First Revision No. 8007-NFPA 70-2020 [New Section after 520.68(C)]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1020-NFPA 70-2021 [Section No. 525.21(A)]

(A) Disconnecting Means.

A means to disconnect each portable structure from all ungrounded conductors shall be provided. The disconnecting means shall be located within sight of and within 1.8 m (6 ft) of the operator's station. The disconnecting means shall be readily accessible to the operator, including when the ride is in operation. Where accessible to unqualified persons, the disconnecting means shall be lockable. A shunt trip device that opens the fused disconnect or circuit breaker where a switch located in the ride operator's console is closed shall be a permissible method of opening the circuit.

Additional Proposed Changes

File Name	Description	Approved
15_CN_188.pdf	70_CN188	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 188 appeared in the First Draft Report on First Revision No. 8188

The Correlating Committee directs the Panel to reconsider the revised text with respect to the use of the word "where" as compared to the word "if' in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition).

Related Item

• First Revision No. 8188

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 19:47:23 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 188-NFPA 70-2021 [Section No. 525.21(A)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:21:03 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to reconsider the revised text with respect to the use of the word “where” as compared to the word “if” in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition).

First Revision No. 8188-NFPA 70-2020 [Section No. 525.21(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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1021-NFPA 70-2021 [Section No. 525.22(A)]

(A) Construction.

Boxes shall be designed so that no live parts are exposed except where necessary for examination, adjustment, servicing, or maintenance by qualified persons. Where installed outdoors, the box shall be of weatherproof construction and mounted so that the bottom of the enclosure is not less than 150 mm (6 in.) above the ground.

Additional Proposed Changes

File Name	Description	Approved
15_CN_189.pdf	70_CN189	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 189 appeared in the First Draft Report on First Revision No. 8189.

The Correlating Committee directs the Panel to reconsider the revised text with respect to the use of the word "where" as compared to the word "if' in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition).

Related Item

• First Revision No. 8189

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 19:52:49 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 189-NFPA 70-2021 [Section No. 525.22(A)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:25:29 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to reconsider the revised text with respect to the use of the word "where" as compared to the word "if" in compliance with Section 3.3.4 of the NEC Style Manual. (where is related to location and if is related to a condition).

First Revision No. 8189-NFPA 70-2020 [Section No. 525.22(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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1022-NFPA 70-2021 [Section No. 530.1]

530.1 Scope.

The requirements of this article shall apply to motion picture and television studios in facilities and locations staffed by qualified personnel, except as provided in 520.1. Such occupancies shall include those using either electronic or film cameras for image capture.

Informational Note: See NFPA 40-2019, *Standard for the Storage and Handling of Cellulose Nitrate Film,* for methods of protecting against cellulose nitrate film hazards.

Additional Proposed Changes

File Name	Description	Approved
15_CN_190.pdf	70_CN190	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 190 appeared in the First Draft Report on First Revision No. 8191.

The Correlating Committee has purview over article scope statements and directs the Panel to reconsider the text in the first sentence to refer to "qualified person" to align with the defined term in Article 100.

Related Item

- First Revision No. 8191

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 19:54:26 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 190-NFPA 70-2021 [Section No. 530.1]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:27:07 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee has purview over article scope statements and directs the Panel to reconsider the text in the first sentence to refer to "qualified person" to align with the defined term in Article 100.

First Revision No. 8191-NFPA 70-2020 [Section No. 530.1]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 1074-NFPA 70-2021 [Section No. 530.11]

530.11 Branch Circuits.

(A) Multi-receptacle circuits

A branch circuit of any size supplying one or more receptacles shall be permitted to supply stage set lighting loads.

(B) GFCI Protection

The requirements in 210.8(B), excluding 210.8(B)(6), shall apply.

Branch circuits supplying egress lighting, life-critical stunts, life-critical special effects, or any other condition where a nonorderly shutdown might introduce additional or increased hazards shall not be protected by GFCIs.

Statement of Problem and Substantiation for Public Comment

Formatting change for easier searching for GFCI requirements.

Related Item

• 530.11

Submitter Information Verification

Submitter Full Name: Alan Rowe
Organization: International Alliance of Theatrical Stage Employees
Affiliation: International Alliance of Theatrical Stage Employees
Street Address:
City:
State:
Zip:
Submittal Date: Sun Aug 08 17:50:20 EDT 2021
Committee: NEC-P15

Public Comment No. 2227-NFPA 70-2021 [Section No. 530.11]

530.11 Branch Circuits.

A branch circuit of any size supplying one or more receptacles shall be permitted to supply stage set lighting loads.

The GFCI requirements ~~in~~ of 210.8(B) , ~~excluding~~ other than 210.8(B)(~~6~~ 4) , shall apply.

Branch circuits supplying egress lighting, life-critical stunts, life-critical special effects, or any other condition where a nonorderly shutdown might introduce additional or increased hazards shall not be protected by GFCIs.

Statement of Problem and Substantiation for Public Comment

Adding GFCI to the sentence will make it appear if one searches for the word GFCI and will significantly improve usability for the intended target audience.

Related Item

• FDR

Submitter Information Verification

Submitter Full Name: Hans Lau
Organization: Dadco Llc
Affiliation: IATSE Local 728 - Hollywood Studio Electrical Lighting Technicians
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 19 19:49:10 EDT 2021
Committee: NEC-P15

Public Comment No. 1419-NFPA 70-2021 [Section No. 530.21(A)]

(A) Listing.

~~Portable stage and studio electrical equipment shall be listed or approved.~~

Field-assembled extension cords and multiconductor cable assemblies consisting of listed connectors and cable shall be permitted in production areas.

Statement of Problem and Substantiation for Public Comment

Everything has to be approved. See 110.2.

Related Item

• FR 8212

Submitter Information Verification

Submitter Full Name: Ryan Jackson
Organization: Ryan Jackson
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 12 16:33:13 EDT 2021
Committee: NEC-P15

Public Comment No. 2228-NFPA 70-2021 [Section No. 530.22(E)]

~~**(E)** Connectors.~~

~~Connectors shall be rated in amperes and designed so that differently rated devices cannot be connected together.~~

~~Exception: 125-volt, 20-ampere, nonlocking (T-slot) receptacles shall be permitted to accept a 15-ampere attachment plug of the same voltage rating.~~

Statement of Problem and Substantiation for Public Comment

The text in 530.22.(E) is an unnecessary duplication of the essentially same text in 530.9.(B)

Related Item

• FDR

Submitter Information Verification

Submitter Full Name: Hans Lau
Organization: Dadco Llc
Affiliation: IATSE Local 728 - Hollywood Studio Electrical Lighting Technicians
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 19 19:53:23 EDT 2021
Committee: NEC-P15

Public Comment No. 1023-NFPA 70-2021 [Section No. 530.22(G)]

(G) Special-Purpose Multi-Circuit Cable Systems.

Special-purpose multi-circuit cable systems shall comply with the requirements of 520.68(D).

Additional Proposed Changes

File Name	Description	Approved
15_CN_191.pdf	70_CN191	

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 191 appeared in the First Draft Report on First Revision No. 8218.

The Correlating Committee directs the Panel to consider that the wording be reviewed with regard to the words "the requirements of' since this phrase might not be necessary.

Related Item

• First Revision No. 8218

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 05 20:00:36 EDT 2021
Committee: NEC-P15

Correlating Committee Note No. 191-NFPA 70-2021 [New Section after 530.12(C)]

Submitter Information Verification

Committee: NEC-P15
Submittal Date: Wed May 05 13:42:25 EDT 2021

Committee Statement

Committee Statement: The Correlating Committee directs the Panel to consider that the wording be reviewed with regard to the words “the requirements of” since this phrase might not be necessary.

First Revision No. 8218-NFPA 70-2020 [New Section after 530.12(C)]

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

Ayer, Lawrence S.
Gallo, Ernest J.
Hickman, Palmer L.
Holub, Richard A.
Hunter, Dean C.
Johnston, Michael J.
Kendall, David H.
Kovacik, John R.
Manche, Alan
McDaniel, Roger D.
Porter, Christine T.
Williams, David A.

Public Comment No. 2225-NFPA 70-2021 [Part I.]

Part I. General.
The Article 530 heading should be changed to “Motion Picture and Television Studios and Remote Locations”.

Statement of Problem and Substantiation for Public Comment

Change to match language introduced in the definition of "Remote Locations". Some AHJs have taken the "Similar Locations" to be buildings and structures that are similar in construction to MP & TV Studios, not to what we in this industry consider "Remote Locations" where a lot of this work is done. That has left a significant void in applicability of the code.

Related Item

• FDR

Submitter Information Verification

Submitter Full Name: Hans Lau
Organization: Dadco Llc
Affiliation: IATSE Local 728 - Hollywood Studio Electrical Lighting Technicians
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 19 19:23:34 EDT 2021
Committee: NEC-P15

Public Comment No. 2226-NFPA 70-2021 [Part I.]

Part I. General.___ Definitions for article 530 should NOT be moved to Article 100. Definitions for chapter 5, 6, and 7 are "special" and specific to the "special occupancies" where they apply.

Statement of Problem and Substantiation for Public Comment

Moving the definitions to Article 100 will significantly reduce the usability of the document for the intended target audience and potentially introduce conflicts with the same or similar words used for more general purpose definitions that belongs in 100.

Related Item

- FDR

Submitter Information Verification

Submitter Full Name: Hans Lau
Organization: Dadco Llc
Affiliation: IATSE Local 728 - Hollywood Studio Electrical Lighting Technicians
Street Address:
City:
State:
Zip:
Submittal Date: Thu Aug 19 19:45:53 EDT 2021
Committee: NEC-P15

Public Comment No. 217-NFPA 70-2021 [Article 100]

Article 100 Definitions

Scope. This article contains only those definitions essential to the application of this *Code*. It is not intended to include commonly defined general terms or commonly defined technical terms from related codes and standards. An article number in parentheses following the definition indicates that the definition only applies to that article.

Informational Note 1: A definition that is followed by a reference in brackets has been extracted from one of the following standards. Only editorial changes were made to the extracted text to make it consistent with this *Code*.

(1) NFPA 30A-2021, *Code for Motor Fuel Dispensing Facilities and Repair Garages*

(2) NFPA 33-2021, *Standard for Spray Application Using Flammable or Combustible Materials*

(3) NFPA 75-2020, *Standard for the Fire Protection of Information Technology Equipment*

(4) NFPA 79-2021, *Electrical Standard for Industrial Machinery*

(5) NFPA 99-2021, *Health Care Facilities Code*

(6) NFPA *101*®-2021, *Life Safety Code*®

(7) NFPA 110-2019, *Emergency and Standby Power Systems*

(8) NFPA 303-2021, *Fire Protection Standard for Marinas and Boatyards*

(9) NFPA 307-2021, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves*

(10) NFPA 501-2017, *Standard on Manufactured Housing*

(11) NFPA 790-2021, *Standard for Competency of Third-Party Field Evaluation Bodies*

(12) NFPA 1192-2021, *Standard on Recreational Vehicles*

Informational Note 2: See Infomational Annex K for a list of article-specific defintions sorted by article.

Abandoned Class 2, Class 3, and PLTC Cable.

Installed Class 2, Class 3, and PLTC cable that is not terminated at equipment and not identified for future use with a tag. (CMP-3)

Abandoned Fire Alarm Cable.

Installed fire alarm cable that is not terminated at equipment other than a connector and not identified for future use with a tag. (CMP-3)

AC Module (Alternating-Current Module).

A complete, environmentally protected unit consisting of solar cells, inverter, and other components, designed to produce ac power. (690) (CMP-4)

AC Module System.

An assembly of ac modules, wiring methods, materials, and subassemblies that are evaluated, identified, and defined as a system. (690) (CMP-4)

Accessible (as applied to equipment).

Capable of being reached for operation, renewal, and inspection. (CMP-1)

Accessible (as applied to wiring methods).

Capable of being removed or exposed without damaging the building structure or finish or not permanently closed in or blocked by the structure, other electrical equipment, other building systems, or finish of the building. (CMP-1)

Accessible, Readily. (Readily Accessible)

Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders, and so forth. (CMP-1)

Informational Note: Use of keys is a common practice under controlled or supervised conditions and a common alternative to the ready access requirements under such supervised conditions as provided elsewhere in the NEC.

Adapter.

A device used to adapt a circuit from one configuration of an attachment plug or receptacle to another configuration with the same current rating. (520) (CMP-15)

Adjustable Speed Drive.

Power conversion equipment that provides a means of adjusting the speed of an electric motor. (CMP-11)

Informational Note: A variable frequency drive is one type of electronic adjustable speed drive that controls the rotational speed of an ac electric motor by controlling the frequency and voltage of the electrical power supplied to the motor.

Adjustable Speed Drive System.

A combination of an adjustable speed drive, its associated motor(s), and auxiliary equipment. (CMP-11)

Air-Conditioning or Comfort-Cooling Equipment.

All of that equipment intended or installed for the purpose of processing the treatment of air so as to control simultaneously or individually its temperature, humidity, cleanliness, and distribution to meet the requirements of the conditioned space. (555) (CMP-7)

Aircraft Painting Hangar.

An aircraft hangar constructed for the express purpose of spraying, coating, and/or dipping applications and provided with dedicated ventilation supply and exhaust. (513) (CMP-14)

Alternate Power Source.

One or more generator sets, or battery systems where permitted, intended to provide power during the interruption of the normal electrical service; or the public utility electrical service intended to provide power during interruption of service normally provided by the generating facilities on the premises. [**99:** 3.3.4] (517) (CMP-15)

Alternating-Current Power Distribution Box (Alternating-Current Plugging Box) (Scatter Box).

An ac distribution center or box that contains one or more grounding-type polarized receptacles that can contain overcurrent protective devices. (530) (CMP-15)

Ambulatory Health Care Occupancy.

An occupancy used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following:

(1) Treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others.

(2) Anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others.

(3) Treatment for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others.

[***101*** :3.3.198.1] (517) (CMP-15)

Ampacity.

The maximum current, in amperes, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating. (CMP-6)

Amplifier (Audio Amplifier) (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. (640) (CMP-12)

Anesthetizing Location.

Any space within a facility that has been designatedfor the administration of any flammable or nonflammable inhalation anesthetic agent during examination or treatment, including the use of such agents for relative analgesia. (517) (CMP-15)

Appliance.

Utilization equipment, generally other than industrial, that is normally built in standardized sizes or types and is installed or connected as a unit to perform one or more functions such as clothes washing, air-conditioning, food mixing, deep frying, and so forth. (CMP-17)

Appliance, Fixed. (Fixed Appliance)

An appliance that is fastened or otherwise secured at a specific location. (CMP-7)

Appliance, Portable. (Portable Appliance)

An appliance that is actually moved or can easily be moved from one place to another in normal use. (550) (CMP-7)

Informational Note: For the purpose of this article, the following major appliances, other than built-in, are considered portable if cord connected: refrigerators, range equipment, clothes washers, dishwashers without booster heaters, or other similar appliances.

Applicator.

The device used to transfer energy between the output circuit and the object or mass to be heated. (665) (CMP-12)

Approved.

Acceptable to the authority having jurisdiction. (CMP-1)

Arc-Fault Circuit Interrupter (AFCI).

A device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected. (CMP-2)

Armored Cable, Type AC.

A fabricated assembly of insulated conductors in a flexible interlocked metallic armor. (CMP-6)

Array.

A mechanically and electrically integrated grouping of modules with support structure, including any attached system components such as inverter(s) or dc-to-dc converter(s) and attached associated wiring. (690) (CMP-4)

Artificially Made Bodies of Water.

Bodies of water that have been constructed or modified to fit some decorative or commercial purpose such as, but not limited to, aeration ponds, fish farm ponds, storm retention basins, treatment ponds, and irrigation (channel) facilities. Water depths may vary seasonally or be controlled. (682) (CMP-17)

Askarel.

A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. (CMP-9)

Informational Note: Askarels of various compositional types are used. Under arcing conditions, the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases, depending on the askarel type.

Associated Apparatus.

Apparatus in which the circuits are not necessarily intrinsically safe themselves but that affects the energy in the intrinsically safe circuits and is relied on to maintain intrinsic safety. Such apparatus is one of the following:

(1) Electrical apparatus that has an alternative type of protection for use in the appropriate hazardous (classified) location

(2) Electrical apparatus not so protected that shall not be used within a hazardous (classified) location

(CMP-14)

Informational Note No. 1: Associated apparatus has identified intrinsically safe connections for intrinsically safe apparatus and also might have connections for nonintrinsically safe apparatus.

Informational Note No. 2: An example of associated apparatus is an intrinsic safety barrier, which is a network designed to limit the energy (voltage and current) available to the protected circuit in the hazardous (classified) location under specified fault conditions.

Associated Nonincendive Field Wiring Apparatus.

Apparatus in which the circuits are not necessarily nonincendive themselves but that affects the energy in nonincendive field wiring circuits and is relied upon to maintain nonincendive energy levels. Such apparatus is one of the following:

(1) Electrical apparatus that has an alternative type of protection for use in the appropriate hazardous (classified) location

(2) Electrical apparatus not so protected that shall not be used in a hazardous (classified) location

(500) (CMP-14)

Informational Note: Associated nonincendive field wiring apparatus has designated associated nonincendive field wiring apparatus connections for nonincendive field wiring apparatus and may also have connections for other electrical apparatus.

Attachment Fitting, Weight Supporting (WSAF).

A device that, by insertion into a weight supporting ceiling receptacle, establishes a connection between the conductors of the attached utilization equipment and the branch-circuit conductors connected to the weight supporting ceiling receptacle. (CMP-18)

Informational Note: A weight supporting attachment fitting is different from an attachment plug because no cord is associated with the fitting. A weight supporting attachment fitting in combination with a weight supporting ceiling receptacle secures the associated utilization equipment in place and supports its weight.

Attachment Plug (Plug Cap) (Plug).

A device that, by insertion in a receptacle, establishes a connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle. (CMP-18)

Audio Autotransformer.

A transformer with a single winding and multiple taps intended for use with an amplifier loudspeaker signal output. (640) (CMP-12)

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. (640) (CMP-12)

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 (using 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. (640) (CMP-12)

Audio Transformer.

A transformer with two or more electrically isolated windings and multiple taps intended for use with an amplifier loudspeaker signal output. (640) (CMP-12)

Authority Having Jurisdiction (AHJ).

An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure. (CMP-1)

Informational Note: The phrase “authority having jurisdiction,” or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

Automatic.

Performing a function without the necessity of human intervention. (CMP-1)

Bathroom.

An area including a sink with one or more of the following: a toilet, a urinal, a tub, a shower, a bidet, or similar plumbing fixtures. (CMP-2)

Battery.

A single cell or a group of cells connected together electrically in series, in parallel, or a combination of both. (CMP-13)

Battery, Flow. (Flow Battery)

An energy storage component that stores its active materials in the form of one or two electrolytes external to the reactor interface. When in use, the electrolytes are transferred between reactor and storage tanks. (706) (CMP-13)

Informational Note: Three commercially available flow battery technologies are zinc air, zinc bromine, and vanadium redox, sometimes referred to as *pumped electrolyte ESS* .

Battery, Sealed. (Sealed Battery)

A battery that has no provision for the routine addition of water or electrolyte or for external measurement of electrolyte specific gravity and might contain pressure relief venting. (CMP-13)

Battery, Stationary Standby (Stationary Standby Battery).

A battery that spends the majority of the time on continuous float charge or in a high state of charge, in readiness for a discharge event. (CMP-13)

Informational Note: Uninterruptible Power Supply (UPS) batteries are an example that falls under this definition.

Battery-Powered Lighting Units.

Individual unit equipment for backup illumination consisting of a rechargeable battery; a battery-charging means; provisions for one or more lamps mounted on the equipment, or with terminals for remote lamps, or both; and a relaying device arranged to energize the lamps automatically upon failure of the supply to the unit equipment. (517) (CMP-15)

Berth.

The water space to be occupied by a boat or other vessel alongside or between bulkheads, piers, piles, fixed and floating docks, or any similar access structure. (See also Slip.) [**303:** 3.3.1] (555) (CMP-7)

Bipolar Circuit.

A dc circuit that is comprised of two monopole circuits, each having an opposite polarity connected to a common reference point. (CMP-4)

Boatyard.

A facility used for constructing, repairing, servicing, hauling from the water, storing (on land and in water), and launching of boats. [**303:** 3.3.2] (555) (CMP-7)

Bonded (Bonding).

Connected to establish electrical continuity and conductivity. (CMP-5)

Bonding Conductor or Jumper (BJ).

A conductor that ensures the required electrical conductivity between metal parts that are required to be electrically connected. (CMP-5)

Bonding Jumper, Equipment (EBJ).

The connection between two or more portions of the equipment grounding conductor. (CMP-5)

Bonding Jumper, Main (MBJ).

The connection between the grounded circuit conductor and the equipment grounding conductor, or the supply-side bonding jumper, or both, at the service. (CMP-5)

Bonding Jumper, Supply-Side (SSBJ).

A conductor installed on the supply side of a service or within a service equipment enclosure(s), or for a separately derived system, that ensures the required electrical conductivity between metal parts required to be electrically connected. (CMP-5)

Bonding Jumper, System (SBJ).

The connection between the grounded circuit conductor and the supply-side bonding jumper, or the equipment grounding conductor, or both, at a separately derived system. (CMP-5)

Border Light.

A permanently installed overhead strip light. (520) (CMP-15)

Bottom Shield, Type FCC.

A protective layer that is installed between the floor and Type FCC flat conductor cable to protect the cable from physical damage and may or may not be incorporated as an integral part of the cable. (324) (CMP-6)

Branch Circuit.

The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s). (CMP-2)

Branch Circuit, Appliance.

A branch circuit that supplies energy to one or more outlets to which appliances are to be connected and that has no permanently connected luminaires that are not a part of an appliance. (CMP-2)

Branch Circuit, General-Purpose.

A branch circuit that supplies two or more receptacles or outlets for lighting and appliances. (CMP-2)

Branch Circuit, Individual.

A branch circuit that supplies only one utilization equipment. (CMP-2)

Branch Circuit, Motor.

The circuit conductors, including equipment, between the motor branch-circuit short-circuit ground-fault protective device and an individual motor. (CMP-11)

Branch Circuit, Multiwire. (Multiwire Branch Circuit)

A branch circuit that consists of two or more ungrounded conductors that have a voltage between them, and a neutral conductor that has equal voltage between it and each ungrounded conductor of the circuit and that is connected to the neutral conductor of the system. (CMP-2)

Branch-Circuit Selection Current (BCSC) (as applied to air-conditioning and refrigerating equipment).

The value in amperes to be used instead of the rated-load current in determining the ratings of motor branch-circuit conductors, disconnecting means, controllers, and branch-circuit short-circuit and ground-fault protective devices wherever the running overload protective device permits a sustained current greater than the specified percentage of the rated-load current. The value of branch-circuit selection current will always be equal to or greater than the marked rated-load current. (440) (CMP-11)

Breakout Assembly.

An adapter used to connect a multipole connector containing two or more branch circuits to multiple individual branch-circuit connectors. (520) (CMP-15)

Broadband.

Wide bandwidth data transmission that transports multiple signals, protocols, and traffic types over various media types. (CMP-16)

Block.

A square or portion of a city, town, or village enclosed by streets and including the alleys so enclosed, but not any street. (800) (CMP-16)

Building.

A structure that stands alone or that is separated from adjoining structures by fire walls. (CMP-1)

Building, Floating. (Floating Building)

A building unit, as defined in Article 100, that floats on water, is moored in a permanent location, and has a premises wiring system served through connection by permanent wiring to an electrical supply system not located on the premises. (555) (CMP-7)

Building, Manufactured. (Manufactured Building)

Any building that is of closed construction and is made or assembled in manufacturing facilities on or off the building site for installation, or for assembly and installation on the building site, other than manufactured homes, mobile homes, park trailers, or recreational vehicles. (545) (CMP-7)

Building Component.

Any subsystem, subassembly, or other system designed for use in or integral with or as part of a structure, which can include structural, electrical, mechanical, plumbing, and fire protection systems, and other systems affecting health and safety. (545) (CMP-7)

Building System.

Plans, specifications, and documentation for a system of manufactured building or for a type or a system of building components, which can include structural, electrical, mechanical, plumbing, and fire protection systems, and other systems affecting health and safety, and including such variations thereof as are specifically permitted by regulation, and which variations are submitted as part of the building system or amendment thereto. (545) (CMP-7)

Bulkhead.

A vertical structural wall, usually of stone, timber, metal, concrete, or synthetic material, constructed along, and generally parallel to, the shoreline to retain earth as an extension of the upland, and often to provide suitable water depth at the waterside face. [**303:** 3.3.4] (555) (CMP-7)

Bull Switch.

An externally operated wall-mounted safety switch that can contain overcurrent protection and is designed for the connection of portable cables and cords. (530) (CMP-15)

Bundled.

Cables or conductors that are tied, wrapped, taped, or otherwise periodically bound together. (520) (CMP-15)

Busbar.

A noninsulated conductor electrically connected to the source of supply and physically supported on an insulator providing a power rail for connection to utilization equipment, such as sensors, actuators, A/V devices, low-voltage luminaire assemblies, and similar electrical equipment. (393) (CMP-18)

Busbar Support.

An insulator that runs the length of a section of suspended ceiling bus rail that serves to support and isolate the busbars from the suspended grid rail. (393) (CMP-18)

Busway.

A raceway consisting of a metal enclosure containing factory-mounted, bare or insulated conductors, which are usually copper or aluminum bars, rods, or tubes. (CMP-8)

Cabinet.

An enclosure that is designed for either surface mounting or flush mounting and is provided with a frame, mat, or trim in which a swinging door or doors are or can be hung. (CMP-9)

Cable.

A factory assembly of two or more conductors having an overall covering. (CMP-16)

Cable, Abandoned. (Abandoned Cable)

Installed cable that is not terminated at equipment or is not identified for future use with a tag. (800) (CMP-16)

Cable, Abandoned Audio Distribution. (Abandoned Audio Distribution Cable)

Installed audio distribution cable that is not terminated at equipment and not identified for future use with a tag. (640) (CMP-12)

Cable, Abandoned Supply Circuits and Interconnecting. (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. (645) (CMP-12)

Cable, Coaxial. (Coaxial Cable)

A cylindrical assembly composed of a conductor centered inside a metallic tube or shield, separated by a dielectric material, and usually covered by an insulating jacket. (CMP-16)

Cable, Communications Circuit Integrity (CI). (Communications Circuit Integrity Cable)

Cable used in communications systems to ensure continued operation of critical circuits during a specified time under fire conditions. (805) (CMP-16)

Cable, Festoon. (Festoon Cable)

Single- and multiple-conductor cable intended for use and installation in accordance with Article 610 where flexibility is required. (610) (CMP-12)

Cable, Medium Voltage, Type MV.

A single or multiconductor solid dielectric insulated cable rated 2001 volts up to and including 35,000 volts, nominal. (CMP-6)

Cable, Optical Fiber, Abandoned. (Abandoned Optical Fiber Cable)

Installed optical fiber cable that is not terminated at equipment other than a connector and not identified for future use with a tag. (770) (CMP-16)

Cable, Optical Fiber. (Optical Fiber Cable)

A factory assembly or field assembly of one or more optical fibers having an overall covering. (CMP-16)

> Informational Note: A field-assembled optical fiber cable is an assembly of one or more optical fibers within a jacket. The jacket, without optical fibers, is installed in a manner similar to conduit or raceway. Once the jacket is installed, the optical fibers are inserted into the jacket, completing the cable assembly.

Cable, Optical Fiber, Conductive. (Conductive Optical Fiber Cable)

A factory assembly of one or more optical fibers having an overall covering and containing non-current-carrying conductive member(s) such as metallic strength member(s), metallic vapor barrier(s), metallic armor, or metallic sheath. (CMP-16)

Cable, Optical Fiber, Hybrid. (Hybrid Optical Fiber Cable)

A cable containing optical fibers and current-carrying electrical conductors. (CMP-16)

Cable, Optical Fiber, Nonconductive. (Nonconductive Optical Fiber Cable)

A factory assembly of one or more optical fibers having an overall covering and containing no electrically conductive materials. (CMP-16)

Cable, Portable Power Feeder. (Portable Power Feeder Cable)

One or more flexible shielded insulated power conductors enclosed in a flexible covering that provides mechanical protection with voltage rating from 2000 to 25,000 volts. (CMP-6)

Cable Bundle.

A group of cables that are tied together or in contact with one another in a closely packed configuration for at least 1.0 m (40 in.). (CMP-3)

> Informational Note: Random or loose installation of individual cables can result in less heating. Combing of the cables can result in less heat dissipation and more signal cross talk between cables.

Cable Connector [as applied to hazardous (classified) locations].

An electrical device that is part of a cable assembly and that, by insertion of two mating configurations, establishes a connection between the conductors of the cable assembly and the conductors of a fixed piece of equipment.

Informational Note: For unclassified locations, such cable connectors are referred to as male and female fittings. Examples of standards for such male and female fittings include ANSI/UL 2238-2018, *Cable Assemblies and Fittings for Industrial Control and Signal Distribution* , and ANSI/UL 2237-2019, *Multi-Point Interconnection Power Cable Assemblies for Industrial Machinery* .

Cable Connector, Type FCC.

A connector designed to join Type FCC cables without using a junction box. (324) (CMP-6)

Cable Joint, Type MV.

A connection consisting of an insulation system and a connector where two (or more) cables are joined together in a way that is to be chemically, mechanically, and electrically stable. (CMP-6)

Cable Management System.

An apparatus designed to control and organize unused lengths of cable or cord at electrified truck parking spaces. (CMP-12)

Cable Routing Assembly.

A single channel or connected multiple channels, as well as associated fittings, forming a structural system that is used to support and route communications wires and cables, optical fiber cables, data cables associated with information technology and communications equipment, Class 2, Class 3, and Type PLTC cables, and power-limited fire alarm cables in plenum, riser, and general-purpose applications. (CMP-16)

Cable Sheath (as applied to metallic conductor cables).

A covering over the conductor assembly that may include one or more metallic members, strength members, or jackets. (CMP-16)

Cable Sheath, Optical Fiber. (Optical Fiber Cable Sheath)

A covering over the optical fiber assembly that includes one or more jackets and may include one or more metallic members or strength members. (CMP-16)

Cable Termination, Type MV.

A connection consisting of an insulation system and a connector and installed on a Type MV cable to connect from a cable to a device, such as equipment, in a way that is to be chemically, mechanically, and electrically stable. (CMP-6)

Cable Tray System.

A unit or assembly of units or sections and associated fittings forming a structural system used to securely fasten or support cables and raceways. (CMP-8)

Cablebus.

An assembly of units or sections with insulated conductors having associated fittings forming a structural system used to securely fasten or support conductors and conductor terminations in a completely enclosed, ventilated, protective metal housing. This assembly is designed to carry fault current and to withstand the magnetic forces of such current. (CMP-8)

Informational Note: Cablebus is ordinarily assembled at the point of installation from the components furnished or specified by the manufacturer in accordance with instructions for the specific job.

Cell (as applied to batteries).

The basic electrochemical unit, characterized by an anode and a cathode, used to receive, store, and deliver electrical energy. (CMP-13)

Cell, Raceway. (Raceway Cell)

A single enclosed tubular space in a cellular metal or concrete floor member, the axis of the cell being parallel to the axis of the floor member. (CMP-8)

Cell, Sealed. (Sealed Cell)

A cell that has no provision for the routine addition of water or electrolyte or for external measurement of electrolyte specific gravity and might contain pressure relief venting. (CMP-13)

Cell Line.

An assembly of electrically interconnected electrolytic cells supplied by a source of direct-current power. (668) (CMP-12)

Cell Line Attachments and Auxiliary Equipment.

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. (668) (CMP-12)

Charge Controller.

Equipment that controls dc voltage or dc current, or both, and that is used to charge a battery or other energy storage device. (CMP-13)

Charger Power Converter.

The device used to convert energy from the power grid to a high-frequency output for wireless power transfer. (625) (CMP-12)

Child Care Facility.

A building or structure, or portion thereof, for educational, supervisory, or personal care services for more than four children 7 years old or less. (406) (CMP-18)

(CATV) Circuit, Premises Community Antenna Television. [Premises Community Antenna Television (CATV) Circuit]

The circuit that extends community antenna television (CATV) systems for audio, video, data, and interactive services from the service provider's network terminal to the appropriate customer equipment. (CMP-16)

Circuit Breaker.

A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without damage to itself when properly applied within its rating. (CMP-10)

Informational Note: The automatic opening means can be integral, direct acting with the circuit breaker, or remote from the circuit breaker.

Circuit Breaker, Adjustable. (Adjustable Circuit Breaker)

A qualifying term indicating that the circuit breaker can be set to trip at various values of current, time, or both, within a predetermined range. (CMP-10)

Circuit Breaker, Instantaneous Trip. (Instantaneous Trip Circuit Breaker)

A qualifying term indicating that no delay is purposely introduced in the tripping action of the circuit breaker. (CMP-10)

Circuit Breaker, Inverse Time. (Inverse Time Circuit Breaker)

A qualifying term indicating that there is a delay purposely introduced in the tripping action of the circuit breaker, and the delay decreases as the magnitude of the current increases. (CMP-10)

Circuit Breaker, Nonadjustable. (Nonadjustable Circuit Breaker)

A qualifying term indicating that the circuit breaker does not have any adjustment to alter the value of the current at which it will trip or the time required for its operation. (CMP-10)

Circuit Integrity (CI) Cable.

Cable(s) marked with the suffix "-CI" used for remote-control, signaling, power-limited, fire alarm, optical fiber, or communications systems that supply critical circuits to ensure survivability for continued circuit operation for a specified time under fire conditions. (CMP-3)

Informational Note: See 728.4 for power circuits installed for survivability.

Class 1 Circuit.

The portion of the wiring system between the load side of the Class 1 power source and the connected equipment. (CMP-3)

Class 2 Circuit.

The portion of the wiring system between the load side of a Class 2 power source and the connected equipment. Due to its power limitations, a Class 2 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock. (CMP-3)

Class 3 Circuit.

The portion of the wiring system between the load side of a Class 3 power source and the connected equipment. Due to its power limitations, a Class 3 circuit considers safety from a fire initiation standpoint. Since higher levels of voltage and current than for Class 2 are permitted, additional safeguards are specified to provide protection from an electric shock hazard that could be encountered. (CMP-3)

Class 4 Circuit.

The portion of the wiring system between the load side of a Class 4 transmitter and the Class 4 receiver or Class 4 utilization equipment, as appropriate. Due to the active monitoring and control of the power transmitted, a Class 4 circuit is not considered a possible ignition source, and it minimizes the risk of electric shock. (CMP-3)

Class 4 Device.

Any active device connected to the Class 4 circuit; examples include a Class 4 transmitter, a Class 4 receiver, or Class 4 utilization equipment. (CMP-3)

Class 4 Power System.

An actively monitored and controlled system consisting of one or more Class 4 transmitters and one or more Class 4 receivers connected by a cabling system. (CMP-3)

Class 4 Receiver.

A device that accepts Class 4 power and converts it for use by utilization equipment. (CMP-3)

Class 4 Transmitter.

A device that sources Class 4 power, monitors the line for faults, ceases power transmission if a fault is sensed, and limits the energy and power into a fault to the levels described in 726.121(A). (CMP-3)

Class 4 Tray Cable (CL4TC).

A factory assembly of two or more insulated conductors rated to at least 450 volts dc, with or without associated bare or insulated equipment grounding conductors, under a nonmetallic jacket. (CMP-3)

Class 4 Utilization Equipment.

Devices that are directly powered by a Class 4 transmitter without the need for a separate Class 4 receiver (the receiver is integrated into the equipment). (CMP-3)

Closed Construction.

Any building, building component, assembly, or system manufactured in such a manner that all concealed parts of processes of manufacture cannot be inspected after installation at the building site without disassembly, damage, or destruction. (545) (CMP-7)

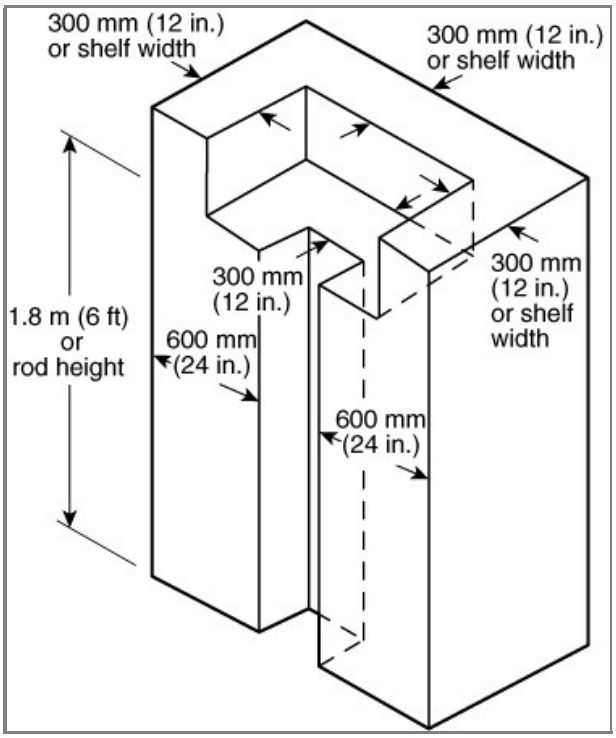
Clothes Closet.

A nonhabitable room or space intended primarily for storage of garments and apparel. (CMP-1)

Clothes Closet Storage Space.

The volume bounded by the sides and back closet walls and planes extending from the closet floor vertically to a height of 1.8 m (6 ft) or to the highest clothes-hanging rod and parallel to the walls at a horizontal distance of 600 mm (24 in.) from the sides and back of the closet walls, respectively, and continuing vertically to the closet ceiling parallel to the walls at a horizontal distance of 300 mm (12 in.) or the width of the shelf, whichever is greater; for a closet that permits access to both sides of a hanging rod, this space includes the volume below the highest rod extending 300 mm (12 in.) on either side of the rod on a plane horizontal to the floor extending the entire length of the rod. (410) (CMP-18)

Figure Figure Informational Note Figure 100.1 Clothes Closet Storage Space.



Collector Rings.

An assembly of slip rings for transferring electric energy from a stationary to a rotating member. (675) (CMP-7)

Combustible Dust.

Dust particles that are 500 microns or smaller (i.e., material passing a U.S. No. 35 Standard Sieve as defined in ASTM E11-2015, *Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves*) and present a fire or explosion hazard when dispersed and ignited in air. (CMP-14)

Informational Note: See ASTM E1226-2012a, *Standard Test Method for Explosibility of Dust Clouds* , or ISO 6184-1-1985, *Explosion protection systems — Part 1: Determination of explosion indices of combustible dusts in air* , for procedures for determining the explosibility of dusts.

Combustible Gas Detection System.

A protection technique utilizing stationary gas detectors in industrial establishments. (CMP-14)

Commissioning.

The process, procedures, and testing used to set up and verify the initial performance, operational controls, safety systems, and sequence of operation of electrical devices and equipment, prior to it being placed into active service. (CMP-13)

Communications Circuit.

A metallic, fiber, or wireless circuit that provides voice/data (and associated power) for communications-related services between communications equipment. (CMP-16)

Communications Circuit, Network-Powered Broadband. (Network-Powered Broadband Communications Circuit)

The circuit extending from the communications utility's or service provider's serving terminal or tap up to and including the NIU. (830) (CMP-16)

Informational Note: A typical one-family dwelling network-powered communications circuit consists of a communications drop or communications service cable and an NIU and includes the communications utility's serving terminal or tap where it is not under the exclusive control of the communications utility.

Communications Circuit, Premises. (Premises Communications Circuit)

The circuit that extends voice, audio, video, data, interactive services, telegraph (except radio), and outside wiring for fire alarm and burglar alarm from the service provider's network terminal to the customer's communications equipment. (840) (CMP-16)

Communications Equipment.

The electronic equipment that performs the telecommunications operations for the transmission of audio, video, and data, and includes power equipment (e.g., dc converters, inverters, and batteries), technical support equipment (e.g., computers), and conductors dedicated solely to the operation of the equipment. (CMP-16)

Informational Note: As the telecommunications network transitions to a more data-centric network, computers, routers, servers, and their powering equipment, are becoming essential to the transmission of audio, video, and data and are finding increasing application in communications equipment installations.

Communications Service Provider.

An organization, business, or individual that offers communications service to others. (CMP-16)

Compact (as applied to conductor stranding).

A conductor where each layer of strands is pressed together to the extent that almost all the gaps between the strands are eliminated so that the overall diameter of the finished conductor is less than a concentric stranded conductor and less than a compressed stranded conductor. (CMP-6)

Compressed (as applied to conductor stranding).

A conductor where the outer layer of strands is pressed together so that the overall diameter of the finished conductor is less than a concentric stranded conductor but greater than a compact stranded conductor. (CMP-6)

Concealable Nonmetallic Extension.

A listed assembly of two, three, or four insulated circuit conductors within a nonmetallic jacket, an extruded thermoplastic covering, or a sealed nonmetallic covering. The classification includes surface extensions intended for mounting directly on the surface of walls or ceilings and concealed with paint, texture, joint compound, plaster, wallpaper, tile, wall paneling, or other similar materials. (CMP-6)

Concealed.

Rendered inaccessible by the structure or finish of the building. (CMP-1)

Informational Note: Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them.

Concealed Knob-and-Tube Wiring.

A wiring method using knobs, tubes, and flexible nonmetallic tubing for the protection and support of single insulated conductors. (CMP-6)

Concentric (as applied to conductor stranding).

A conductor consisting of a straight central strand surrounded by one or more layers of strands, helically laid in a geometric pattern. (CMP-6)

Conductor, Bare.

A conductor having no covering or electrical insulation whatsoever. (CMP-6)

Conductor, Covered.

A conductor encased within material of composition or thickness that is not recognized by this *Code* as electrical insulation. (CMP-6)

Conductor, Insulated.

A conductor encased within material of composition and thickness that is recognized by this *Code* as electrical insulation. (CMP-6)

Conductor, Insulated (as applied to messenger-supported wiring).

Overhead service conductor encased in a polymeric material that has been evaluated for the applied nominal voltage and any conductor types described in 310.4. (396) (CMP-6)

Informational Note: See ICEA S-76-474-2011, *Standard for Neutral Supported Power Cable Assemblies with Weather-Resistant Extruded Insulation Rated 600 Volts* , for evidence of evaluation of overhead service conductors.

Conduit, Flexible Metal (FMC). (Flexible Metal Conduit)

A raceway of circular cross section made of helically wound, formed, interlocked metal strip. (CMP-8)

Conduit, High Density Polyethylene (HDPE). (High Density Polyethylene Conduit)

A nonmetallic raceway of circular cross section, with associated couplings, connectors, and fittings for the installation of electrical conductors. (CMP-8)

Conduit, Intermediate Metal (IMC). (Intermediate Metal Conduit)

A steel threadable raceway of circular cross section designed for the physical protection and routing of conductors and cables and for use as an equipment grounding conductor when installed with its integral or associated coupling and appropriate fittings. (CMP-8)

Conduit, Liquidtight Flexible Metal (LFMC). (Liquidtight Flexible Metal Conduit)

A raceway of circular cross section having an outer liquidtight, nonmetallic, sunlight-resistant jacket over an inner flexible metal core with associated couplings, connectors, and fittings for the installation of electric conductors. (CMP-8)

Conduit, Liquidtight Flexible Nonmetallic (LFNC). (Liquidtight Flexible Nonmetallic Conduit)

A raceway of circular cross section of various types as follows:

(1) A smooth seamless inner core and cover bonded together and having one or more reinforcement layers between the core and covers, designated as Type LFNC-A

(2) A smooth inner surface with integral reinforcement within the raceway wall, designated as Type LFNC-B

(3) A corrugated internal and external surface without integral reinforcement within the raceway wall, designated as Type LFNC-C

(CMP-8)

Informational Note: FNMC is an alternative designation for LFNC.

Conduit, Nonmetallic Underground with Conductors (NUCC). (Nonmetallic Underground Conduit with Conductors)

A factory assembly of conductors or cables inside a nonmetallic, smooth wall raceway with a circular cross section. (CMP-8)

Conduit, Reinforced Thermosetting Resin (RTRC). (Reinforced Thermosetting Resin Conduit)

A rigid nonmetallic raceway of circular cross section, with integral or associated couplings, connectors, and fittings for the installation of electrical conductors and cables. (CMP-8)

Conduit, Rigid Metal (RMC). (Rigid Metal Conduit)

A threadable raceway of circular cross section designed for the physical protection and routing of conductors and cables and for use as an equipment grounding conductor when installed with its integral or associated coupling and appropriate fittings. (CMP -8)

Conduit, Rigid Polyvinyl Chloride (PVC). (Rigid Polyvinyl Chloride Conduit)

A rigid nonmetallic raceway of circular cross section, with integral or associated couplings, connectors, and fittings for the installation of electrical conductors and cables. (CMP-8)

Conduit Body.

A separate portion of a conduit or tubing system that provides access through a removable cover(s) to the interior of the system at a junction of two or more sections of the system or at a terminal point of the system.

Boxes such as FS and FD or larger cast or sheet metal boxes are not classified as conduit bodies. (CMP-9)

Connector.

A term used to refer to an electromechanical fitting. (393) (CMP-18)

Connector, Intercell. (Intercell Connector)

An electrically conductive bar or cable used to connect adjacent cells. (CMP-13)

Connector, Intertier. (Intertier Connector)

An electrical conductor used to connect two cells on different tiers of the same rack or different shelves of the same rack. (CMP-13)

Connector, Load

An electromechanical connector used for power from the busbar to utilization equipment. (393) (CMP-18)

Connector, Pendant.

An electromechanical or mechanical connector used to suspend low-voltage luminaire or utilization equipment below the grid rail and to supply power to connect from the busbar to utilization equipment. (393) (CMP-18)

Connector, Power Feed.

An electromechanical connector used to connect the power supply to a power distribution cable, to connect directly to the busbar, or to connect from a power distribution cable to the busbar. (393) (CMP-18)

Connector, Pressure (Solderless).

A device that establishes a connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder. (CMP-1)

Connector, Rail to Rail.

An electromechanical connector used to interconnect busbars from one ceiling grid rail to another grid rail. (393) (CMP-18)

Connector Strip.

A metal wireway containing pendant or flush receptacles. (520) (CMP-15)

Container (as applied to batteries).

A single-cell or multicell vessel or jar that holds the plates, electrolyte, and other elements of a single unit in a battery. (CMP-13)

Continuous Load.

A load where the maximum current is expected to continue for 3 hours or more. (CMP-2)

Control.

The predetermined process of connecting, disconnecting, increasing, or reducing electric power. (750) (CMP-13)

Control Circuit.

The circuit of a control apparatus or system that carries the electric signals directing the performance of the controller but does not carry the main power current. (CMP-11)

Control Circuits, Fault-Tolerant External. (Fault-Tolerant External Control Circuits)

Those control circuits either entering or leaving the fire pump controller enclosure, which if broken, disconnected, or shorted will not prevent the controller from starting the fire pump from all other internal or external means and may cause the controller to start the pump under these conditions. (695) (CMP-13)

Control Device, Emergency Lighting.

A separate or integral device intended to perform one or more emergency lighting control functions. (700) (CMP-13)

Informational Note: See UL 924, *Emergency Lighting and Power Equipment* , for information covering emergency lighting control devices.

Control Drawing.

A drawing or other document provided by the manufacturer of the intrinsically safe or associated apparatus, or of the nonincendive field wiring apparatus or associated nonincendive field wiring apparatus, that details the allowed interconnections between the intrinsically safe and associated apparatus or between the nonincendive field wiring apparatus or associated nonincendive field wiring apparatus. (CMP-14)

Control Room (as applied to 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. (620) (CMP-12)

Control Space (as applied to elevator, dumbwaiter).

A space inside or outside the hoistway, other than a 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,dumbwaiter, escalator, moving walk, or platform lift, but not the electrical driving machine or the hydraulic machine. (620) (CMP-12)

Control System.

The overall system governing the starting, stopping, direction of motion, acceleration, speed, and retardation of the moving member. (620) (CMP-12)

Controller.

A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected. (CMP-1)

Controller, Motion. (Motion Controller)

The electrical device(s) for that part of the control system that governs the acceleration, speed, retardation, and stopping of the moving member. (620) (CMP-12)

Controller, Motor. (Motor Controller)

The operative units of the control system comprising the starter device(s) and power conversion equipment used to drive an electric motor or the pumping unit used to power hydraulic control equipment. (620) (CMP-12)

Controller, Motor. (Motor Controller)

Any switch or device that is normally used to start and stop a motor by making and breaking the motor circuit current. (CMP-11)

Controller, Operation. (Operation Controller)

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. (620) (CMP-12)

Converter.

A device that changes electrical energy from one form to another, as from alternating current to direct current. (551) (CMP-7)

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. (665) (CMP-12)

Cooking Unit, Counter-Mounted.

A cooking appliance designed for mounting in or on a counter and consisting of one or more heating elements, internal wiring, and built-in or mountable controls. (CMP-2)

Coordination, Selective. (Selective Coordination)

Localization of an overcurrent condition to restrict outages to the circuit or equipment affected, accomplished by the selection and installation of overcurrent protective devices and their ratings or settings for the full range of available overcurrents, from overload to the available fault current, and for the full range of overcurrent protective device opening times associated with those overcurrents. (CMP-10)

Copper-Clad Aluminum Conductors.

Conductors drawn from a copper-clad aluminum rod, with the copper metallurgically bonded to an aluminum core. (CMP-6)

Cord, Flexible. (Flexible Cord)

Two or more flexible insulated conductors enclosed in a flexible covering that provides mechanical protection. [**79:** 3.3.29] (CMP-6)

Cord Connector.

A female contact device that mates with an attachment plug or other male device. (CMP-6)

Cord Connector.

A fitting intended to terminate a cord to a box or similar device and reduce the strain at points of termination; might include an explosionproof, a dust-ignitionproof, or a flameproof seal. (CMP-14)

Cord Connector (as applied to Electrified Truck Parking Spaces).

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. (626) (CMP-12)

Cord Set.

A length of flexible cord having an attachment plug at one end and a cord connector at the other end. (CMP-6)

Corrosive Environment — Swimming Pools, Fountains, and Similar Installations.

Areas or enclosures without adequate ventilation, where electrical equipment is located and pool sanitation chemicals are stored, handled, or dispensed . (680) (CMP-17).

> Informational Note No. 1: See *Advisory: Swimming Pool Chemical: Chlorine* , OSWER 90-008.1, June 1990, available from the EPA National Service Center for Environmental Publications (NSCEP) as sanitation chemicals and pool water are considered to pose a risk of corrosion (gradual damage or destruction of materials) due to the presence of oxidizers (e.g., calcium hypochlorite, sodium hypochlorite, bromine, chlorinated isocyanurates) and chlorinating agents that release chlorine when dissolved in water.
>
> Informational Note No. 2: See ANSI/APSP-11, *Standard for Water Quality in Public Pools and Spas* , ANSI/ASHRAE 62.1, Table 6-4 Minimum Exhaust Rates, and Section 324 of the *2021 International Swimming Pool and Spa Code (ISPSC)* , including associated definitions and requirements concerning adequate ventilation of indoor spaces such as equipment and chemical storage rooms, which can reduce the likelihood of the accumulation of corrosive vapors. Chemicals such as chlorine cause severe corrosive and deteriorating effects on electrical connections, equipment, and enclosures when stored and kept in the same vicinity.

Crane.

A mechanical device used for lifting or moving boats. [**303:** 3.3.5] (555) (CMP-7)

Critical Branch.

A system of feeders and branch circuits supplying power for task illumination, fixed equipment, select receptacles, and select power circuits serving areas and functions related to patient care that are automatically connected to alternate power sources by one or more transfer switches during interruption of the normal power source. [**99:** 3.3.30] (517) (CMP-15)

Critical Operations Areas, Designated (DCOA). (Designated Critical Operations Areas)

Areas within a facility or site designated as requiring critical operations power. (CMP-13)

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. (645) (CMP-12)

Critical Operations Power Systems (COPS).

Power systems for facilities or parts of facilities that require continuous operation for the reasons of public safety, emergency management, national security, or business continuity. (CMP-13)

Cutout Box.

An enclosure designed for surface mounting that has swinging doors or covers secured directly to and telescoping with the walls of the enclosure. (CMP-9)

Data Center, Modular (MDC). (Modular Data Center)

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. (646) (CMP-12)

> Informational Note: 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.

DC-to-DC Converter.

A device that can provide an output dc voltage and current at a higher or lower value than the input dc voltage and current. (CMP-4)

DC-to-DC Converter Circuit.

The dc circuit conductors connected to the output of a dc-to-dc converter. (CMP-4)

DC System, Reference-Grounded. (Reference-Grounded DC System)

A system that is not solidly grounded but has a low-resistance electrical reference that maintains voltage to ground in normal operation. (712) (CMP-13)

DC System, Three-Wire, Grounded. (Grounded Three-Wire DC System)

A system with a solid connection or reference-ground between the center point of a bipolar dc power source and the equipment grounding system. (712) (CMP-13)

DC System, Two-Wire, Grounded. (Grounded Two-Wire DC System)

A system that has a solid connection or reference-ground between one of the current-carrying conductors and the equipment grounding system. (712) (CMP-13)

DC System, Ungrounded. (Ungrounded DC System)

A system that has no direct or resistive connection between the current-carrying conductors and the equipment grounding system. (712) (CMP-13)

Dead Front.

Without live parts exposed to a person on the operating side of the equipment. (CMP-9)

Dead Front (as applied to switches, circuit breakers, switchboards, and panelboards).

Designed, constructed, and installed so that no current-carrying parts are normally exposed on the front. (551) (CMP-7)

Demand Factor.

The ratio of the maximum demand of a system, or part of a system, to the total connected load of a system or the part of the system under consideration. (CMP-2)

Dental Office.

A building or part thereof in which the following occur:

(1) Examinations and minor treatments/procedures performed under the continuous supervision of a dental professional;

(2) Use of limited to minimal sedation and treatment or procedures that do not render the patient incapable of self-preservation under emergency conditions; and

(3) No overnight stays for patients or 24-hour operations.

[**99:** 3.3.38] (CMP-15)

Device.

A unit of an electrical system, other than a conductor, that carries or controls electric energy as its principal function. (CMP-1)

Dielectric Heating.

Heating of a nominally insulating material due to its own dielectric losses when the material is placed in a varying electric field. (665) (CMP-12)

Different Intrinsically Safe Circuits.

Intrinsically safe circuits in which the possible interconnections have not been evaluated and identified as intrinsically safe. (504) (CMP-14)

Direct-Current (dc) Combiner.

An enclosure that includes devices used to connect two or more PV system dc circuits in parallel. (690) (CMP-4)

Disconnecting Means.

A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply. (CMP-1)

Disconnecting Means, Parking Space. (Parking Space Disconnecting Means)

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. (626) (CMP-12)

Disconnecting Means, Recreational Vehicle. (Recreational Vehicle Disconnecting Means)

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 a recreational vehicle and intended to constitute the means of cutoff for the supply to that recreational vehicle. (551) (CMP-7)

Distribution Point.

An electrical supply point from which service drops, service conductors, feeders, or branch circuits to buildings or structures utilized under single management are supplied. (547) (CMP-7)

Informational Note No. 1: Distribution points are also known as the center yard pole, meter pole, or the common distribution point.

Informational Note No. 2: The service point as defined in Article 100 is typically at the distribution point.

Diversion Charge Controller.

Equipment that regulates the charging process of an ESS by diverting power from energy storage to direct-current or alternating-current loads or to an interconnected utility service. (706) (CMP-13)

Diversion Charge Controller.

Equipment that regulates the charging process of a battery or other energy storage device by diverting power from energy storage to dc or ac loads, or to an interconnected utility service. (CMP-4)

Diversion Load.

A load connected to a diversion charge controller or diversion load controller, also known as a dump load. (CMP-4)

Diversion Load Controller.

Equipment that regulates the output of a wind generator by diverting power from the generator to dc or ac loads or to an interconnected utility service. (CMP-4)

Docking Facility.

A covered or open, fixed or floating structure that provides access to the water and to which boats are secured. [**303:** 3.3.6] (555) (CMP-7)

Dormitory Unit.

A building or a space in a building in which group sleeping accommodations are provided for more than 16 persons who are not members of the same family in one room, or a series of closely associated rooms, under joint occupancy and single management, with or without meals, but without individual cooking facilities. (CMP 2)

Drop Box.

A box containing pendant- or flush-mounted receptacles attached to a multiconductor cable via strain relief or a multipole connector. (520) (CMP-15)

Drilling Rig Cable, Type P.

A factory assembly of one or more insulated flexible tinned copper conductors, with associated equipment grounding conductor(s), with or without a braided metallic armor and with an overall nonmetallic jacket. (CMP-6)

Dust-Ignitionproof.

Equipment enclosed in a manner that excludes dusts and does not permit arcs, sparks, or heat otherwise generated or liberated inside of the enclosure to cause ignition of exterior accumulations or atmospheric suspensions of a specified dust on or in the vicinity of the enclosure. (CMP-14)

Informational Note No. 1: See ANSI/UL 1203-2015, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations* , for additional information on dust-ignitionproof enclosures.

Informational Note No. 2: Dust-ignitionproof enclosures are sometimes additionally marked Type 9 in accordance with NEMA 250-2014, *Enclosures for Electrical Equipment (1000 Volts Minimum)* .

Dusttight.

Enclosures constructed so that dust will not enter under specified test conditions. (CMP-14)

Informational Note No. 1: See ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* , for additional information.

Informational Note No. 2: Enclosure Types 3, 3X, 3S, 3SX, 4, 4X, 5, 6, 6P, 12, 12K, and 13, in accordance with NEMA 250-2014, *Enclosures for Electrical Equipment (1000 Volts Minimum),* and ANSI/UL 50E-2015, *Enclosures for Electrical Equipment, Environmental Considerations* , are considered dusttight.

Duty, Continuous.

Operation at a substantially constant load for an indefinitely long time. (CMP-1)

Duty, Intermittent.

Operation for alternate intervals of (1) load and no load; or (2) load and rest; or (3) load, no load, and rest. (CMP-1)

Duty, Periodic.

Intermittent operation in which the load conditions are regularly recurrent. (CMP-1)

Duty, Short-Time.

Operation at a substantially constant load for a short and definite, specified time. (CMP-1)

Duty, Varying.

Operation at loads, and for intervals of time, both of which may be subject to wide variation. (CMP-1)

Dwelling, Multifamily.

A building that contains three or more dwelling units. (CMP-1)

Dwelling, One-Family.

A building that consists solely of one dwelling unit. (CMP-1)

Dwelling, Two-Family.

A building that consists solely of two dwelling units. (CMP-1)

Dwelling Unit.

A single unit, providing complete and independent living facilities for one or more persons, including permanent provisions for living, sleeping, cooking, and sanitation. (CMP-2)

Electric-Discharge Lighting.

Systems of illumination utilizing fluorescent lamps, high-intensity discharge (HID) lamps, or neon tubing. (CMP-18)

Electric Power Production and Distribution Network.

Power production, distribution, and utilization equipment and facilities, such as electric utility systems that are connected to premises wiring and are external to and not controlled by a system that operates in interactive mode. (CMP-13)

Electric Sign.

A fixed, stationary, or portable self-contained, electrically operated and/or electrically illuminated utilization equipment with words or symbols designed to convey information or attract attention. (CMP-18)

Electric Supply Stations.

Locations containing the generating stations and substations, including their associated generator, storage battery, transformer, and switchgear areas. (CMP-4)

Electric Vehicle (EV).

An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, and electric motorcycles, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel 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. (CMP-12)

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

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. (625) (CMP-12)

Informational Note: See 625.48 for further information on interactive systems.

Electric Vehicle Power Export Equipment (EVPE).

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

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

Electric Vehicle Supply Equipment (EVSE).

Equipment for plug-in charging comprising 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. (625) (CMP-12)

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

Electrical Circuit Protective System.

A system consisting of components and materials intended for installation as protection for specific electrical wiring systems with respect to the disruption of electrical circuit integrity upon exterior fire exposure. (CMP-16)

Electrical Datum Plane.

A specified distance above a water level above which electrical equipment can be installed and electrical connections can be made. (CMP-7)

Electrical Datum Plane.

A specified distance above the normal highwater level which electrical equipment can be installed and electrical connections can be made. (CMP-7)

Electrical Ducts.

Electrical conduits, or other raceways round in cross section, that are suitable for use underground or embedded in concrete. (CMP-6)

Electrical Life Support Equipment.

Electrically powered equipment whose continuous operation is necessary to maintain a patient's life. [**99** :3.3.45] (517) (CMP-15)

Electrical Resistance Trace Heating "60079-30-1".

Type of protection for the purpose of producing heat on the principle of electrical resistance and typically composed of one or more metallic conductors and/or an electrically conductive material, suitably electrically insulated and protected. (506) (CMP-14)

Informational Note: See ANSI/UL 60079-30-1-2017, *Explosive Atmospheres — Part 30-1: Electrical Resistance Trace Heating — General and Testing Requirements* .

Electrically Connected.

A connection capable of carrying current as distinguished from connection through electromagnetic induction. (668) (CMP-12)

Electrically Powered Pool Lift.

An electrically powered lift that provides accessibility to and from a pool or spa for people with disabilities. (680) (CMP-17)

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. (626) (CMP-12)

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. (626) (CMP-12)

Electronic Power Converter.

A device that uses power electronics to convert one form of electrical power into another form of electrical power. (CMP-4)

Informational Note: Examples of electronic power converters include, but are not limited to, inverters, dc-to-dc converters, and electronic charge controllers. These devices have limited current capabilities based on the device ratings at continuous rated power.

Electronically Protected (as applied to motors).

A motor provided with electronic control that is an integral part of the motor and protects the motor against dangerous overheating due to failure of the electronic control, overload, and failure to start. (CMP-11)

Electrolyte.

The medium that provides the ion transport mechanism between the positive and negative electrodes of a cell. (CMP-13)

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. (668) (CMP-12)

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. (668) (CMP-12)

Emergency Luminaire, Battery-Equipped (Battery-Equipped Emergency Luminaire).

A luminaire with a rechargeable battery, a battery charging means, and an automatic load control relay. (700) (701) (CMP-13)

Emergency Power Supply (EPS).

The source(s) of electric power of the required capacity and quality for an emergency power supply system (EPSS). (CMP-13)

Emergency Power Supply System (EPSS).

This definition shall apply within this article and throughout the code. A complete functioning EPS system coupled to a system of conductors, disconnecting means and overcurrent protective devices, transfer switches, and all control, supervisory, and support devices up to and including the load terminals of the transfer equipment needed for the system to operate as a safe and reliable source of electric power. [**110:** 3.3.4] (CMP-13)

Emergency Systems.

Those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life. (CMP-13)

Encapsulation “m”.

Type of protection where electrical parts that could ignite an explosive atmosphere by either sparking or heating are enclosed in a compound in such a way that this explosive atmosphere cannot be ignited. (CMP-14)

Informational Note: See ANSI/UL 60079-18-2015, *Explosive atmospheres — Part 18: Equipment protection by encapsulation “m”.*

Enclosed.

Surrounded by a case, housing, fence, or wall(s) that prevents persons from accidentally contacting energized parts. (CMP-1)

Enclosed-Break.

Having electrical make-or-break contacts such that, if an internal explosion of the flammable gas or vapor that can enter it occurs, the device will withstand the internal explosion without suffering damage and without communicating the internal explosion to the external flammable gas or vapor. (500) (CMP-14)

Informational Note: See ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* , for additional information.

Enclosure.

The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage. (CMP-1)

Informational Note: See Table 110.28 for examples of enclosure types.

Energized.

Electrically connected to, or is, a source of voltage. (CMP-1)

Energy Management System.

A system consisting of any of the following: a monitor(s), communications equipment, a controller(s), a timer(s), or other device(s) that monitors and/or controls an electrical load or a power production or storage source. (CMP-13)

Energy Storage System (ESS).

One or more devices installed as a system capable of storing energy and providing electrical energy into the premises wiring system or an electric power production and distribution network. (CMP-13)

Informational Note No. 1: An ESS(s) can include but is not limited to batteries, capacitors, and kinetic energy devices (e.g., flywheels and compressed air). An ESS(s) can include inverters or converters to change voltage levels or to make a change between an ac or a dc system.

Informational Note No. 2: These systems differ from a stationary standby battery installation where a battery spends the majority of the time on continuous float charge or in a high state of charge, in readiness for a discharge event.

Entertainment Device.

A mechanical or electromechanical device that provides an entertainment experience. (522) (CMP-15)

Informational Note: These devices can include animated props, show action equipment, animated figures, and special effects, coordinated with audio and lighting to provide an entertainment experience.

Equipment.

A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, an electrical installation. (CMP-1)

Equipment, Portable (as applied to audio equipment). (Portable Equipment)

Equipment fed with portable cords or cables intended to be moved from one place to another. (640) (CMP-12)

Equipment, Signal. (Signal Equipment)

Includes audible and visual equipment such as chimes, gongs, lights, and displays that convey information to the user. (620) (CMP-12)

Equipment Branch.

A system of feeders and branch circuits arranged for delayed, automatic, or manual connection to the alternate power source and that serves primarily 3-phase power equipment. [**99** :3.3.50] (517) (CMP-15)

Equipment Protection Level (EPL).

Level of protection assigned to equipment based on its likelihood of becoming a source of ignition, and distinguishing the differences between explosive gas atmospheres and explosive dust atmospheres. (CMP-14)

Equipment Rack.

A framework for the support, enclosure, or both, of equipment; can be portable or stationary. (640) (CMP-12)

Informational Note: See EIA/ECA 310-E-2005, *Cabinets, Racks, Panels and Associated Equipment* , for examples of equipment racks.

Equipotential Plane.

Conductive parts bonded together to reduce voltage gradients in a designated area. (682) (CMP-17)

Equipotential Plane (as applied to agricultural buildings).

An area where wire mesh or other conductive elements are embedded in or placed under concrete, bonded to all metal structures and fixed nonelectrical equipment that could become energized, and connected to the electrical grounding system to minimize voltage differences within the plane and between the planes, the grounded equipment, and the earth. (547) (CMP-7)

Essential Electrical System.

A system comprised of alternate power sources and all connected distribution systems and ancillary equipment, designed to ensure continuity of electrical power to designated areas and functions of a health care facility during disruption of normal power sources, and also to minimize disruption within the internal wiring system. [**99** :3.3.52] (517) (CMP-15)

Explosionproof Equipment.

Equipment enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor that might occur within it, that is capable of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and that operates at such an external temperature that a surrounding flammable atmosphere will not be ignited. (CMP-14)

Informational Note No. 1: See ANSI/UL 1203-2015, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations* , for additional information.

Informational Note No. 2: Explosionproof enclosures are sometimes additionally marked Type 7 in accordance with NEMA 250-2014, *Enclosures for Electrical Equipment (1000 Volts Minimum)* .

Exposed (as applied to live parts).

Capable of being inadvertently touched or approached nearer than a safe distance by a person. (CMP-1)

Informational Note: This term applies to parts that are not suitably guarded, isolated, or insulated.

Exposed (as applied to wiring methods).

On or attached to the surface or behind panels designed to allow access. (CMP-1)

Exposed (Optical Fiber Cable Exposed to Accidental Contact).

A conductive optical fiber cable in such a position that, in case of failure of supports or insulation, contact between the cable's non–current-carrying conductive members and an electrical circuit might result. (CMP-16)

Exposed (to Accidental Contact).

A circuit in such a position that, in case of failure of supports or insulation, contact with another circuit may result. (CMP-16)

Informational Note: See Part I of Article 100 for two other definitions of Exposed: *Exposed (as applied to live parts) and Exposed (as applied to wiring methods).*

Exposed Conductive Surfaces.

Those surfaces that are capable of carrying electric current and that are unprotected, uninsulated, unenclosed, or unguarded, permitting personal contact. [**99:** 3.3.54] (517) (CMP-15)

Informational Note: Paint, anodizing, and similar coatings are not considered suitable insulation, unless they are listed for such use.

Externally Operable.

Capable of being operated without exposing the operator to contact with live parts. (CMP-1)

Facility, On-Site Power Production. (On-Site Power Production Facility)

The normal supply of electric power for the site that is expected to be constantly producing power. (695) (CMP-13)

Fastened-in-Place.

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

Fault-Managed Power (FMP).

A powering system that monitors for faults and controls power delivered to ensure fault energy is limited. The monitoring and control systems differentiate them from electric light and power circuits; therefore, alternative requirements to those of Chapters 1 through 4 are given regarding minimum wire sizes, ampacity adjustment and correction factors, overcurrent protection, insulation requirements, and wiring methods and materials. (CMP-3)

Fault Current.

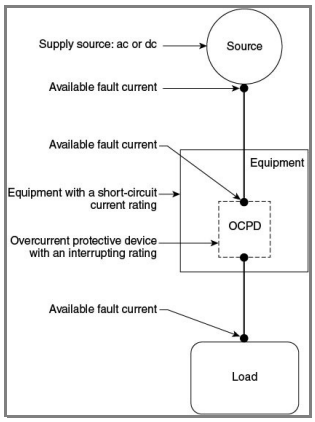
The current delivered at a point on the system during a short-circuit condition. (CMP-10)

Fault Current, Available. (Available Fault Current)

The largest amount of current capable of being delivered at a point on the system during a short-circuit condition. (CMP-10)

Informational Note: A short-circuit can occur during abnormal conditions such as a fault between circuit conductors or a ground fault. See Informational Note Figure 100.2 .

Figure Informational Note Figure 100.2 Available Fault Current.



Fault Hazard Current.

See *Hazard Current* .

Fault Protection Device.

An electronic device that is intended for the protection of personnel and functions under fault conditions, such as network-powered broadband communications cable short or open circuit, to limit the current or voltage, or both, for a low-power network-powered broadband communications circuit and provide acceptable protection from electric shock. (830) (CMP-16)

Feeder.

All circuit conductors between the service equipment, the source of a separately derived system, or other power supply source and the final branch-circuit overcurrent device. (CMP-10)

Feeder, Recreational Vehicle Site. (Recreational Vehicle Site Feeder)

The conductors between the park service equipment and the recreational vehicle site supply equipment. (551) (CMP-7)

Feeder Assembly.

The overhead or under-chassis feeder conductors, including the equipment grounding conductor, together with the necessary fittings and equipment or a power-supply cord listed for mobile home use, identified for the delivery of energy from the source of electrical supply to the panelboard within the mobile home. (550) (CMP-7)

Festoon Lighting.

A string of outdoor lights that is suspended between two points. (CMP-18)

Field Evaluation Body (FEB).

An organization or part of an organization that performs field evaluations of electrical or other equipment. [**790**, 2018] (CMP-1)

Informational Note: NFPA 790-2018, *Standard for Competency of Third-Party Field Evaluation Bodies* , provides guidelines for establishing the qualification and competency of a body performing field evaluations of electrical products and assembles with electrical components.

Field Labeled (as applied to evaluated products).

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an FEB indicating the equipment or materials were evaluated and found to comply with requirements as described in an accompanying field evaluation report. [**790**, 2018] (CMP-1)

Fire Alarm Circuit.

The portion of the wiring system between the load side of the overcurrent device or the power-limited supply and the connected equipment of all circuits powered and controlled by the fire alarm system. Fire alarm circuits are classified as either non–power-limited or power-limited. (CMP-3)

Fire Alarm Circuit Integrity (CI) Cable.

Cable used in fire alarm systems to ensure continued operation of critical circuits during a specified time under fire conditions. (CMP-3)

Fire-Resistive Cable System.

A cable and components used to ensure survivability of critical circuits for a specified time under fire conditions. (CMP-3)

Fitting.

An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function. (CMP-1)

Fixed (as applied to equipment).

Equipment that is fastened or otherwise secured at a specific location. (680) (CMP-17)

Fixed-in-Place.

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

Flammable Anesthetics.

Gases or vapors, such as fluroxene, cyclopropane, divinyl ether, ethyl chloride, ethyl ether, and ethylene, that could form flammable or explosive mixtures with air, oxygen, or reducing gases such as nitrous oxide. (517) (CMP-15)

Flammable Anesthetizing Location.

Any area of the facility that has been designated to be used for the administration of any flammable inhalation anesthetic agents in the normal course of examination or treatment. (517) (CMP-15)

Flameproof “d”.

Type of protection where the enclosure will withstand an internal explosion of a flammable mixture that has penetrated into the interior, without suffering damage and without causing ignition, through any joints or structural openings in the enclosure of an external explosive gas atmosphere consisting of one or more of the gases or vapors for which it is designed. (505) (CMP-14)

Informational Note: See ANSI/UL 60079-1-2015, *Explosive Atmospheres — Part 1: Equipment Protection by Flameproof Enclosures “d”.*

Flat Cable Assembly, Type FC.

An assembly of parallel conductors formed integrally with an insulating material web specifically designed for field installation in surface metal raceway. (CMP-6)

Flat Conductor Cable System.

A complete wiring system for branch circuits that is designed for installation under carpet squares. (324) (CMP-6)

Informational Note: The FCC system includes Type FCC cable and associated shielding, connectors, terminators, adapters, boxes, and receptacles.

Flat Conductor Cable, Type FCC Cable.

Three or more flat copper conductors placed edge-to-edge and separated and enclosed within an insulating assembly.

Flywheel ESS (FESS).

A mechanical ESS composed of a spinning mass referred to as a rotor and an energy conversion mechanism such as a motor-generator that converts the mechanical energy to electrical energy. (706) (CMP-13)

Informational Note: There are primarily two types of rotor constructions, solid metal mass design and composite fiber design.

Footlight.

A border light installed on or in the stage. (520) (CMP-15)

Forming Shell.

A structure designed to support a wet-niche luminaire assembly and intended for mounting in a pool or fountain structure. (680) (CMP-17)

Fountain.

An ornamental structure or recreational water feature from which one or more jets or streams of water are discharged into the air, including splash pads, ornamental pools, display pools, and reflection pools. The definition does not include drinking water fountains or water coolers. (680) (CMP-17)

Frame (as applies to recreational vehicles).

Chassis rail and any welded addition thereto of metal thickness of 1.35 mm (0.053 in.) or greater. (551) (CMP-7)

Free Air (as applied to conductors).

Open or ventilated environment that allows for heat dissipation and air flow around an installed conductor. (CMP-6)

Fuel Cell.

An electrochemical system that consumes fuel to produce an electric current. In such cells, the main chemical reaction used for producing electric power is not combustion. However, there may be sources of combustion used within the overall cell system, such as reformers/fuel processors. (CMP-4)

Fuel Cell System.

The complete aggregate of equipment used to convert chemical fuel into usable electricity and typically consisting of a reformer, stack, power inverter, and auxiliary equipment. (CMP-4)

Fuse.

An overcurrent protective device with a circuit-opening fusible part that is heated and severed by the passage of overcurrent through it. (CMP-10)

Informational Note: A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

Fuse, Expulsion. (Expulsion Fuse)

A vented fuse unit in which the expulsion effect of gases produced by the arc and lining of the fuseholder, either alone or aided by a spring, extinguishes the arc. (CMP-10)

Fuse, Nonvented Power. (Nonvented Power Fuse)

A fuse without intentional provision for the escape of arc gases, liquids, or solid particles to the atmosphere during circuit interruption. (CMP-10)

Fuse, Power. (Power Fuse)

A vented, nonvented, or controlled vented fuse unit in which the arc is extinguished by being drawn through solid material, granular material, or liquid, either alone or aided by a spring. (CMP-10)

Fuse, Vented Power. (Vented Power Fuse)

A fuse with provision for the escape of arc gases, liquids, or solid particles to the surrounding atmosphere during circuit interruption. (CMP-10)

Fuse, Electronically Actuated. (Electronically Actuated Fuse)

An overcurrent protective device that generally consists of a control module that provides current-sensing, electronically derived time–current characteristics, energy to initiate tripping, and an interrupting module that interrupts current when an overcurrent occurs. Such fuses may or may not operate in a current-limiting fashion, depending on the type of control selected. (CMP-10)

Garage.

A building or portion of a building in which one or more self-propelled vehicles can be kept for use, sale, storage, rental, repair, exhibition, or demonstration purposes. (CMP-1)

Informational Note: See 511.1 for commercial garages, repair and storage.

Generating Capacity, Inverter. (Inverter Generating Capacity)

The sum of parallel-connected inverter maximum continuous output power at 40°C in watts, kilowatts, volt-amperes, or kilovolt-amperes. (CMP-4)

Generating Station.

A plant wherein electric energy is produced by conversion from some other form of energy (e.g., chemical, nuclear, solar, wind, mechanical, or hydraulic) by means of suitable apparatus. (CMP-4)

Generator (Generator Set).

A machine that converts mechanical energy into electrical energy by means of a prime mover and alternator and/or inverter. (CMP-13)

Generator, On-Site Standby. (On-Site Standby Generator)

A facility producing electric power on site as the alternate supply of electric power. It differs from an on-site power production facility in that it is not constantly producing power. (695) (CMP-13)

Grid Bus Rail.

A combination of the busbar, the busbar support, and the structural suspended ceiling grid system. (393) (CMP-18)

Ground.

The earth. (CMP-5)

Ground-Fault Circuit Interrupter (GFCI).

A device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a ground-fault current exceeds the values established for a Class A device. (CMP-2)

Informational Note: Class A ground-fault circuit interrupters trip when the ground-fault current is 6 mA or higher and do not trip when the ground-fault current is less than 4 mA. For further information, see UL 943, *Standard for Ground-Fault Circuit Interrupters*.

Ground-Fault Condition.

An unintentional, electrically conductive connection between an ungrounded conductor of an electrical circuit and the normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment, or earth. (CMP-5)

Ground-Fault Current Path.

An electrically conductive path from the point of a ground fault on a wiring system through normally non–current-carrying conductors, grounded conductors, equipment, or the earth to the electrical supply source. (CMP-5)

Informational Note: Examples of ground-fault current paths are any combination of equipment grounding conductors, metallic raceways, metallic cable sheaths, electrical equipment, and any other electrically conductive material such as metal, water, and gas piping; steel framing members; stucco mesh; metal ducting; reinforcing steel; shields of communications cables; grounded conductors; and the earth itself.

Ground-Fault Current Path, Effective. (Effective Ground-Fault Current Path)

An intentionally constructed, low-impedance electrically conductive path designed and intended to carry current under ground-fault conditions from the point of a ground fault on a wiring system to the electrical supply source and that facilitates the operation of the overcurrent protective device or ground-fault detectors. (CMP-5)

Ground-Fault Detector Interrupter (GFDI).

A device that provides ground-fault protection for PV dc circuits. (690) (CMP-4)

Informational Note: See UL 1741, *Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resource* , for further information on GFDI equipment.

Ground-Fault Protection of Equipment. (GFPE).

A system intended to provide protection of equipment from damaging line-to-ground fault currents by operating to cause a disconnecting means to open all ungrounded conductors of the faulted circuit. This protection is provided at current levels less than those required to protect conductors from damage through the operation of a supply circuit overcurrent device. (CMP-5)

Grounded (Grounding).

Connected (connecting) to ground or to a conductive body that extends the ground connection. (CMP-5)

Grounded, Functionally. (Functionally Grounded)

A system that has an electrical ground reference for operational purposes that is not solidly grounded. (712) (CMP-13)

Informational Note: Examples of operational reasons for functionally grounded systems include ground-fault detection and performance-related issues for some power sources.

Grounded, Functionally. (Functionally Grounded)

A system that has an electrical ground reference for operational purposes that is not solidly grounded. (CMP-4)

Informational Note: A functionally grounded system is often connected to ground through an electronic means internal to an inverter or charge controller that provides ground-fault protection. Examples of operational purposes for functionally grounded systems include ground-fault detection and performance-related issues for some power sources.

Grounded, Solidly.

Connected to ground without inserting any resistor or impedance device. (CMP-5)

Grounded Conductor.

A system or circuit conductor that is intentionally grounded. (CMP-5)

Informational Note: Although an equipment grounding conductor is grounded, it is not considered a grounded conductor.

Grounded Conductor, Impedance. (Impedance Grounded Conductor)

A conductor that connects the system neutral point to the impedance device in an impedance grounded system. (CMP-5)

Grounded System, Impedance. (Impedance Grounded System)

An electrical system that is grounded by intentionally connecting the system neutral point to ground through an impedance device. (CMP-5)

Grounding Conductor, Equipment (EGC).

A conductive path(s) that is part of an effective ground-fault current path and connects normally non-current-carrying metal parts of equipment together and to the system grounded conductor or to the grounding electrode conductor, or both. (CMP-5)

Informational Note No. 1: It is recognized that the equipment grounding conductor also performs bonding.

Informational Note No. 2: See 250.118 for a list of acceptable equipment grounding conductors.

Grounding Electrode.

A conducting object through which a direct connection to earth is established. (CMP-5)

Grounding Electrode Conductor (GEC).

A conductor used to connect the system grounded conductor or the equipment to a grounding electrode or to a point on the grounding electrode system. (CMP-5)

Grouped.

Cables or conductors positioned adjacent to one another but not in continuous contact with each other. (520) (CMP-15)

Guarded.

Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach or contact by persons or objects to a point of danger. (CMP-1)

Guest Room.

An accommodation combining living, sleeping, sanitary, and storage facilities within a compartment. (CMP-2)

Guest Suite.

An accommodation with two or more contiguous rooms comprising a compartment, with or without doors between such rooms, that provides living, sleeping, sanitary, and storage facilities. (CMP-2)

Gutter, Metal Auxiliary. (Metal Auxiliary Gutter)

A sheet metal enclosure used to supplement wiring spaces at meter centers, distribution centers, switchgear, switchboards, and similar points of wiring systems. The enclosure has hinged or removable covers for housing and protecting electrical wires, cable, and busbars. The enclosure is designed for conductors to be laid or set in place after the enclosures have been installed as a complete system. (CMP-8)

Gutter, Nonmetallic Auxiliary. (Nonmetallic Auxiliary Gutter)

A flame-retardant, nonmetallic enclosure used to supplement wiring spaces at meter centers, distribution centers, switchgear, switchboards, and similar points of wiring systems. The enclosure has hinged or removable covers for housing and protecting electrical wires, cable, and busbars. The enclosure is designed for conductors to be laid or set in place after the enclosures have been installed as a complete system. (CMP-8)

Habitable Room.

A room in a building for living, sleeping, eating, or cooking, but excluding bathrooms, toilet rooms, closets, hallways, storage or utility spaces, and similar areas. (CMP-2)

Handhole Enclosure.

An enclosure for use in underground systems, provided with an open or closed bottom, and sized to allow personnel to reach into, but not enter, for the purpose of installing, operating, or maintaining equipment or wiring or both. (CMP-9)

Hazard Current.

For a given set of connections in an isolated power system, the total current that would flow through a low impedance if it were connected between either isolated conductor and ground. [99:3.3.72] (517) (CMP-15)

Fault Hazard Current (as applied to hazard current).

The hazard current of a given isolated power system with all devices connected except the line isolation monitor. [**99:** 3.3.72.1] (517) (CMP-15)

Monitor Hazard Current (as applied to hazard current).

The hazard current of the line isolation monitor alone. [**99:** 3.3.72.2] (517) (CMP-15)

Total Hazard Current (as applied to hazard current).

The hazard current of a given isolated system with all devices, including the line isolation monitor, connected. [**99:** 3.3.72.3] (517) (CMP-15)

Hazardous (Classified) Locations.

Locations where fire or explosion hazards might exist due to flammable gases, flammable liquid–produced vapors, combustible liquid–produced vapors, combustible dusts, combustible fiber/flyings, or ignitible fibers/flyings. (CMP-14)

Header.

Transverse metal raceways for electrical conductors, providing access to predetermined cells of a precast cellular concrete floor, thereby permitting the installation of electrical conductors from a distribution center to the floor cells. (CMP-8)

Health Care Facilities.

Buildings, portions of buildings, or mobile enclosures in which human medical, dental, psychiatric, nursing, obstetrical, or surgical care is provided. [**99:** 3.3.73] (CMP-15)

> Informational Note: Examples of health care facilities include, but are not limited to, hospitals, nursing homes, limited care facilities, clinics, medical and dental offices, and ambulatory care centers, whether permanent or movable.

Health Care Facility's Governing Body.

The person or persons who have the overall legal responsibility for the operation of a health care facility. [**99:** 3.3.74] (517) (CMP-15)

Health Care Microgrid.

A group of interconnected loads and distributed energy resources within clearly defined boundaries that acts as a single controllable entity with respect to the utility. [**99:** 3.3.75] (517) (CMP-15)

Heating Equipment.

Any equipment that is used for heating purposes and whose heat is generated by induction or dielectric methods. (665) (CMP-12)

Heating Panel.

A complete assembly provided with a junction box or a length of flexible conduit for connection to a branch circuit. (CMP-17)

Heating Panel Set.

A rigid or nonrigid assembly provided with nonheating leads or a terminal junction assembly identified as being suitable for connection to a wiring system. (CMP-17)

Heating System.

A complete system consisting of components such as heating elements, fastening devices, nonheating circuit wiring, leads, temperature controllers, safety signs, junction boxes, raceways, and fittings. (426) (CMP-17)

Heating System, Impedance. (Impedance Heating System)

A system in which heat is generated in an object, such as a pipe, rod, or combination of such objects serving as a heating element, by causing current to flow through such objects by direct connection to an ac voltage source from an isolating transformer. In some installations the object is embedded in the surface to be heated or constitutes the exposed component to be heated. (CMP-17)

Heating System, Induction. (Induction Heating System)

A system in which heat is generated in a pipeline or vessel wall by inducing current in the pipeline or vessel wall from an external isolated ac field source. (CMP-17)

Heating System, Skin Effect. (Skin-Effect Heating System)

A system in which heat is generated on the inner surface of a ferromagnetic envelope embedded in or fastened to the surface to be heated.

Informational Note: Typically, an electrically insulated conductor is routed through and connected to the envelope at the other end. The envelope and the electrically insulated conductor are connected to an ac voltage source from an isolating transformer. (CMP-17)

Hermetic Refrigerant Motor-Compressor.

A combination consisting of a compressor and motor, both of which are enclosed in the same housing, with no external shaft or shaft seals, with the motor operating in the refrigerant. (CMP-11)

Hermetically Sealed.

Sealed against the entrance of an external atmosphere, such that the seal is made by fusion of metal, ceramic to metal, or glass to metal. (CMP-14)

Informational Note: See ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* , for additional information.

High Voltage.

A potential difference of more than 1000 volts, nominal. (CMP-9)

Informational Note: Circuits and equipment rated at potential differences of more than 1000 volts and up to 52 kV are also commonly referred to as medium voltage.

Hoistway.

Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate. (CMP-12)

Hospital.

A building or portion thereof used on a 24-hour basis for the medical, psychiatric, obstetrical, or surgical care of four or more inpatients. [***101*** : 3.3.152] (CMP-15)

Host Sign.

A sign or outline lighting system already installed in the field that is designated for field conversion of the illumination system with a retrofit kit. (600) (CMP-18)

Hydromassage Bathtub.

A permanently installed bathtub equipped with a recirculating piping system, pump, and associated equipment. It is designed so it can accept, circulate, and discharge water upon each use. (680) (CMP-17)

Identified (as applied to equipment).

Recognizable as suitable for the specific purpose, function, use, environment, application, and so forth, where described in a particular *Code* requirement. (CMP-1)

Informational Note: Some examples of ways to determine suitability of equipment for a specific purpose, environment, or application include investigations by a qualified testing laboratory (listing and labeling), an inspection agency, or other organizations concerned with product evaluation.

In Sight From (Within Sight From, Within Sight).

Where this *Code* specifies that one equipment shall be “in sight from,” “within sight from,” or “within sight of,” and so forth, another equipment, the specified equipment is to be visible and not more than 15 m (50 ft) distant from the other. (CMP-1)

Increased Safety “e”.

Type of protection applied to electrical equipment that does not produce arcs or sparks in normal service and under specified abnormal conditions, in which additional measures are applied so as to give increased security against the possibility of excessive temperatures and of the occurrence of arcs and sparks. (505) (CMP-14)

Informational Note: See ANSI/UL 60079-7-2017, *Explosive Atmospheres — Part 7: Equipment Protection by Increased Safety “e”.*

Induction Heating (Induction Melting) (Induction Welding).

The heating, melting, or welding of a nominally conductive material due to its own I2R losses when the material is placed in a varying electromagnetic field. (665) (CMP-12)

Industrial Control Panel.

An assembly of two or more components consisting of one of the following: (1) power circuit components only, such as motor controllers, overload relays, fused disconnect switches, and circuit breakers; (2) control circuit components only, such as push buttons, pilot lights, selector switches, timers, switches, and control relays; (3) a combination of power and control circuit components. These components, with associated wiring and terminals, are mounted on, or contained within, an enclosure or mounted on a subpanel.

The industrial control panel does not include the controlled equipment. (CMP-11)

Industrial Establishment [as applied to hazardous (classified) locations].

A building(s) or structure(s) approved for industrial use by the authority having jurisdiction with restricted access where the conditions of maintenance and engineering supervision ensure that only qualified persons design, install, operate, and service the installation. (CMP-14)

Information Technology Equipment (ITE).

Equipment and systems rated 1000 volts or less, normally found in offices or other business establishments and similar environments classified as ordinary locations, that are used for creation and manipulation of data, voice, video, and similar signals that are not communications equipment as defined in Part I of Article 100 and do not process communications circuits as defined in 805.2. (CMP-12)

> Informational Note: For information on listing requirements for both information technology equipment and communications equipment, see UL 60950-1-2014, *Information Technology Equipment — Safety — Part 1: General Requirements* or UL 62368-1-2014, *Audio/Video Information and Communication Technology Equipment Part 1: Safety Requirements* .

Information Technology Equipment Room.

A room within the information technology equipment area that contains the information technology equipment. [**75:** 3.3.14] (CMP-12)

Inherently Safe Optical Radiation “op is”.

Type of protection to minimize the risk of ignition in explosive atmospheres from optical radiation where visible or infrared radiation is incapable of producing sufficient energy under normal or specified fault conditions to ignite a specific explosive atmosphere. (CMP-14)

> Informational Note: See ANSI/UL 60079-28-2017, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation* .

Innerduct.

A nonmetallic raceway placed within a larger raceway. (CMP-16)

Instrumentation Tray Cable (Type ITC).

A factory assembly of two or more insulated conductors, with or without an equipment grounding conductor(s), enclosed in a nonmetallic sheath. (CMP-3)

Insulating End, Type FCC.

An insulator designed to electrically insulate the end of a Type FCC cable. (324) (CMP-6)

Integrated Gas Spacer Cable, Type IGS.

A factory assembly of one or more conductors, each individually insulated and enclosed in a loose fit, nonmetallic flexible conduit as an integrated gas spacer cable rated 0 volts through 600 volts. (CMP-6)

Interactive Mode.

The operating mode for power production equipment that is operating in parallel with and capable of delivering energy to an electric power production and distribution network or other primary source. (CMP-4)

Interrupting Rating.

The highest current at rated voltage that a device is identified to interrupt under standard test conditions. (CMP-10)

> Informational Note: Equipment intended to interrupt current at other than fault levels may have its interrupting rating implied in other ratings, such as horsepower or locked rotor current.

Intersystem Bonding Termination (IBT).

A device that provides a means for connecting intersystem bonding conductors for communications systems to the grounding electrode system. (CMP-16)

Intrinsic Safety “i”.

Type of protection where any spark or thermal effect is incapable of causing ignition of a mixture of flammable or combustible material in air under prescribed test conditions. (CMP-14)

> Informational Note: See UL 913-2015, *Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1 Hazardous (Classified) Locations* ; and ANSI/UL 60079-11-2013, *Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety “i”.*

Intrinsically Safe Apparatus.

Apparatus in which all the circuits are intrinsically safe. (CMP-14)

Intrinsically Safe Circuit.

A circuit in which any spark or thermal effect is incapable of causing ignition of a mixture of flammable or combustible material in air under prescribed test conditions. (CMP-14)

Informational Note: Test conditions are described in ANSI/UL 913-2013, *Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations* .

Intrinsically Safe System.

An assembly of interconnected intrinsically safe apparatus, associated apparatus, and interconnecting cables, in which those parts of the system that might be used in hazardous (classified) locations are intrinsically safe circuits. (504) (CMP-14)

Informational Note: An intrinsically safe system might include more than one intrinsically safe circuit.

Invasive Procedure.

Any procedure that penetrates the protective surfaces of a patient's body (i.e., skin, mucous membrane, cornea) and that is performed with an aseptic field (procedural site). [Not included in this category are placement of peripheral intravenous needles or catheters used to administer fluids and/or medications, gastrointestinal endoscopies (i.e., sigmoidoscopies), insertion of urethral catheters, and other similar procedures.] [**99:** 3.3.91] (517) (CMP-15)

Inverter.

Equipment that changes dc to ac. (CMP-4)

Inverter, Interactive. (Interactive Inverter)

Inverter equipment having the capability to operate only in interactive mode. (CMP-13)

Inverter, Multimode. (Multimode Inverter)

Inverter equipment capable of operating in both interactive and island modes. (CMP-4)

Inverter, Stand-alone. (Stand-alone Inverter)

Inverter equipment having the capabilities to operate only in island mode. (CMP-4)

Inverter Input Circuit.

Conductors connected to the dc input of an inverter. (CMP-13)

Inverter Output Circuit.

Conductors connected to the ac output of an inverter. (CMP-13)

Inverter Utilization Output Circuit.

Conductors between the multimode or stand-alone inverter and utilization equipment. (706) (CMP-13)

Irrigation Machine.

An electrically driven or controlled machine, with one or more motors, not hand-portable, and used primarily to transport and distribute water for agricultural purposes. (675) (CMP-7)

Irrigation Machine, Center Pivot (Center Pivot Irrigation Machine). .

A multimotored irrigation machine that revolves around a central pivot and employs alignment switches or similar devices to control individual motors. (675) (CMP-7)

Isolated Power System.

A system comprising an isolation transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors. [**99:** 3.3.93] (517) (CMP-15)

Isolation Transformer.

A transformer of the multiple-winding type, with the primary and secondary windings physically separated, that inductively couples its ungrounded secondary winding to the grounded feeder system that energizes its primary winding. [**99:** 3.3.94] (517) (CMP-15)

Island Mode.

The operating mode for power production equipment that is disconnected from an electric power production and distribution network or other primary power source and capable of delivering energy to loads. (CMP-4)

Isolated (as applied to location).

Not readily accessible to persons unless special means for access are used. (CMP-1)

Kitchen.

An area with a sink and permanent provisions for food preparation and cooking. (CMP-2)

Labeled.

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner. (CMP-1)

Informational Note: If a listed product is of such a size, shape, material, or surface texture that it is not possible to apply legibly the complete label to the product, the complete label may appear on the smallest unit container in which the product is packaged.

Laundry Area.

An area containing or designed to contain a laundry tray, clothes washer, or clothes dryer. (CMP-2)

LED Sign Illumination System.

A complete lighting system for use in signs and outline lighting consisting of light-emitting diode (LED) light sources, power supplies, wire, and connectors to complete the installation. (600) (CMP-18)

Leakage-Current Detector-Interrupter (LCDI).

A device provided in a power supply cord or cord set that senses leakage current flowing between or from the cord conductors and interrupts the circuit at a predetermined level of leakage current. (440) (CMP-11)

Legally Required Standby Systems.

Those systems required and so classed as legally required standby by municipal, state, federal, or other codes or by any governmental agency having jurisdiction. These systems are intended to automatically supply power to selected loads (other than those classed as emergency systems) in the event of failure of the normal source. (CMP-13)

Life Safety Branch.

A system of feeders and branch circuits supplying power for lighting, receptacles, and equipment essential for life safety that is automatically connected to alternate power sources by one or more transfer switches during interruption of the normal power source. [**99:** 3.3.97] (517) (CMP-15)

Lighting Assembly, Cord-and-Plug-Connected. (Cord-and-Plug-Connected Lighting Assembly)

A lighting assembly consisting of a luminaire intended for installation in the wall of a spa, hot tub, or storable pool, and a cord-and-plug-connected transformer. (680) (CMP-17)

Lighting Assembly, Through-Wall. (Through-Wall Lighting Assembly)

A lighting assembly intended for installation above grade, on or through the wall of a pool, consisting of two interconnected groups of components separated by the pool wall. (680) (CMP-17)

Lighting Outlet.

An outlet intended for the direct connection of a lampholder or luminaire. (CMP-18)

Lighting Track (Track Lighting).

A manufactured assembly designed to support and energize luminaires that are capable of being readily repositioned on the track. Its length can be altered by the addition or subtraction of sections of track. (CMP-18)

Likely to Become Energized.

Conductive material that could become energized because of electrical insulation or electrical spacing failure. (CMP-5)

Limited Care Facility.

A building or portion of a building used on a 24-hour basis for the housing of four or more persons who are incapable of self-preservation because of age; physical limitation due to accident or illness; or limitations such as intellectual disability/developmental disability, mental illness, or chemical dependency.[***101:*** 3.3.93.2] (CMP-15)

Limited Finishing Workstation.

An apparatus that is capable of confining the vapors, mists, residues, dusts, or deposits that are generated by a spray application process but does not meet the requirements of a spray booth or spray room, as herein defined. [**33:** 3.3.18.1] (516) (CMP-14)

Informational Note: See Section 14.3 of NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials* , for information on limited finishing workstations.

Line Isolation Monitor.

A test instrument designed to continually check the balanced and unbalanced impedance from each line of an isolated circuit to ground and equipped with a built-in test circuit to exercise the alarm without adding to the leakage current hazard. [**99:** 3.3.99] (517) (CMP-15)

Listed.

Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose. (CMP-1)

Informational Note: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. Use of the system employed by the listing organization allows the authority having jurisdiction to identify a listed product.

Liquid Immersion “o”.

Type of protection where electrical equipment is immersed in a protective liquid so that an explosive atmosphere that might be above the liquid or outside the enclosure cannot be ignited. (505) (CMP-14)

Informational Note: See ANSI/UL 60079-6-2016, *Explosive Atmospheres — Part 6: Equipment Protection by Liquid Immersion “o”.*

Live Parts.

Energized conductive components. (CMP-1)

Load Management.

The process of limiting the total electrical load on an electrical supply system to a set value by adjusting or controlling the individual loads. (625) (CMP-12)

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

Load Management System.

Associated interconnected equipment that will actively regulate the individual loads via load control equipment such that the total load on the electrical supply system stays below a given maximum permitted total value. The system performs the task of load management. (625) (CMP-12)

Informational Note: Load control equipment consists of equipment or modules within a piece of equipment that communicate with individual loads and other load control equipment within a load management system to manage the total load on the electrical supply system. The communications between load control equipment, as well as the implementation of the control process, may be achieved through hardware, software, or a combination of both.

Location (Shooting Location).

A place outside a motion picture studio where a production or part of a production is filmed or recorded. (530) (CMP-15)

Location Board (Deuce Board).

Portable equipment containing a lighting contactor(s) and overcurrent protection designed for remote control of stage lighting. (530) (CMP-15)

Location, Damp.

Locations protected from weather and not subject to saturation with water or other liquids but subject to moderate degrees of moisture. (CMP-1)

Informational Note: Examples of such locations include partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements, some barns, and some cold-storage warehouses.

Location, Dry.

A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction. (CMP-1)

Location, Wet.

A location that is one or more of the following:

(1) Unprotected and exposed to weather

(2) Subject to saturation with water and other liquids

(3) Underground

(4) In concrete slabs or masonry in direct contact with the earth

(CMP-1)

Informational Note: A vehicle washing area is an example of a wet location saturated with water or other liquids.

Long-Time Rating (as applied to nonmedical X-ray equipment).

A rating based on an operating interval of 5 minutes or longer. (660) (CMP-12)

Long-Time Rating (Standby Power).

A rating based on an operating interval of 5 minutes or longer. (CMP-15)

Low Voltage (as applied to recreational vehicles).

An electromotive force rated 24 volts, nominal, or less. (551) (CMP-7)

Low-Voltage Contact Limit.

A voltage not exceeding the following values:

(1) 15 volts (RMS) for sinusoidal ac

(2) 21.2 volts peak for nonsinusoidal ac

(3) 30 volts for continuous dc

(4) 12.4 volts peak for dc that is interrupted at a rate of 10 to 200 Hz

(680) (CMP-17)

Low-Voltage Suspended Ceiling Power Distribution System.

A system that serves as a support for a finished ceiling surface and consists of a busbar and busbar support system to distribute power to utilization equipment supplied by a Class 2 power supply. (393) (CMP-18)

Loudspeaker.

Equipment that converts an ac electric signal into an acoustic signal. The term speaker is commonly used to mean *loudspeaker*. (640) (CMP-12)

Luminaire.

A complete lighting unit consisting of a light source such as a lamp or lamps, together with the parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source or the ballast or to distribute the light. A lampholder itself is not a luminaire. (CMP-18)

Luminaire, Dry-Niche. (Dry-Niche Luminaire)

A luminaire intended for installation in the floor or wall of a pool, spa, or fountain in a niche that is sealed against the entry of water. (680) (CMP-17)

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

A luminaire supplied by the facility emergency power system and with a control input for dimming or switching that provides an emergency illumination level upon loss of normal power. (700) (CMP-13)

Informational Note: See ANSI/UL 924, Emergency Lighting and Power Equipment, for information covering directly controlled emergency luminaires.

Luminaire, No-Niche. (No-Niche Luminaire)

A luminaire intended for installation above or below the water without a niche. (680) (CMP-17)

Luminaire, Wet-Niche. (Wet-Niche Luminaire)

A luminaire intended for installation in a forming shell mounted in a pool or fountain structure where the luminaire will be completely surrounded by water. (680) (CMP-17)

Machine Room (as applied to 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. (620) (CMP-12)

Machine Room and Control Room, Remote (as applied to elevator, dumbwaiter). (Remote Machine Room and Control Room)

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. (620) (CMP-12)

Machinery, Industrial. (Industrial Machinery) (Industrial 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.] (CMP-12)

Machinery Space (as applied to 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 the 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. (620) (CMP-12)

Machinery Space and Control Space, Remote (as applied to elevator, dumbwaiter). (Remote Machinery Space and Control Space)

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. (620) (CMP-12)

Major Repair Garage.

A building or portions of a building where major repairs, such as engine overhauls, painting, body and fender work, and repairs that require draining of the motor vehicle fuel tank are performed on motor vehicles, including associated floor space used for offices, parking, or showrooms. [**30A:** 3.3.12.1] (511) (CMP-14)

Manufactured Home.

A structure, transportable in one or more sections, which in the traveling mode is 2.4 m (8 ft) or more in width or 12.2 m (40 ft) or more in length, or when erected on site is 29.77 m2 (320 ft2) or more is built on a permanent chassis and is designed to be used as a dwelling with or without a permanent foundation, whether or not connected to the utilities, and includes plumbing, heating, air conditioning, and electrical systems contained therein. The term *manufactured home* includes any structure that meets all the requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by the regulatory agency. Calculations used to determine the number of square meters (square feet) in a structure are based on the structure's exterior dimensions and include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows. [**501:** 1.2.13] For the purpose of this *Code* and unless otherwise indicated, the term mobile home includes manufactured homes and excludes park trailers defined in 552.4. (CMP-7)

Informational Note No. 1: See the applicable building code for definition of the term *permanent foundation* .

Informational Note No. 2: See 24 CFR Part 3280, *Manufactured Home Construction and Safety Standards, of the Federal Department of Housing and Urban Development* , for additional information on the definition.

Manufactured Wiring System.

A system containing component parts that are assembled in the process of manufacture and cannot be inspected at the building site without damage or destruction to the assembly and used for the connection of luminaires, utilization equipment, continuous plug-in type busways, and other devices. (604) (CMP-7)

Marina.

A facility, generally on the waterfront, that stores and services boats in berths, on moorings, and in dry storage or dry stack storage. [**303:** 3.3.12] (555) (CMP-7)

Maximum Output Power.

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

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

Maximum Output Power.

The maximum 1 minute average power output a wind turbine produces in normal steady-state operation (instantaneous power output can be higher). (694) (CMP-4)

Maximum Voltage.

The maximum voltage the wind turbine produces in operation including open circuit conditions. (694) (CMP-4)

Maximum Water Level.

The highest level that water can reach before it spills out. (680) (CMP-17)

Medical Office.

A building or part thereof in which the following occur:

(1) Examinations and minor treatments/procedures performed under the continuous supervision of a medical professional;

(2) The use of limited to minimal sedation and treatment or procedures that do not render the patient incapable of self-preservation under emergency conditions; and

(3) No overnight stays for patients or 24-hour operations.

[**99:** 3.3.110] (CMP-15)

Membrane Enclosure.

A temporary enclosure used for the spraying of workpieces that cannot be moved into a spray booth where open spraying is not practical due to proximity to other operations, finish quality, or concerns such as the collection of overspray. (516) (CMP-14)

Informational Note: See Chapter 18 of NFPA 33-2021, *Standard for Spray Application Using Flammable or Combustible Materials* , for information on the construction and use of membrane enclosures.

Messenger-Supported Wiring.

An exposed wiring support system using a messenger wire to support insulated conductors by any one of the following:

(1) A messenger with rings and saddles for conductor support

(2) A messenger with a field-installed lashing material for conductor support

(3) Factory-assembled aerial cable

(4) Multiplex cables utilizing a bare conductor, factory assembled and twisted with one or more insulated conductors, such as duplex, triplex, or quadruplex type of construction

(CMP-6)

Messenger or Messenger Wire.

A wire that is run along with or integral with a cable or conductor to provide mechanical support for the cable or conductor. (CMP-6)

Metal Clad Cable, Type MC.

A factory assembly of one or more insulated circuit conductors with or without optical fiber members enclosed in an armor of interlocking metal tape, or a smooth or corrugated metallic sheath. (CMP-6)

Metal Shield Connections, Type FCC.

Means of connection designed to electrically and mechanically connect a metal shield to another metal shield, to a receptacle housing or self-contained device, or to a transition assembly. (324) (CMP-6)

Microgrid, Direct Current. (Direct Current Microgrid) (DC Microgrid)

A direct current microgrid is a power distribution system consisting of more than one interconnected dc power source, supplying dc-dc converter(s), dc load(s), and/or ac load(s) powered by dc-ac inverter(s). A dc microgrid is typically not directly connected to an ac primary source of electricity, but some dc microgrids interconnect via one or more dc-ac bidirectional converters or dc-ac inverters. (712) (CMP-13)

Informational Note: Direct current power sources include ac-dc converters (rectifiers), bidirectional dc-ac inverters/converters, photovoltaic systems, wind generators, energy storage systems (including batteries), and fuel cells.

Microgrid Control System (MCS).

A structured control system that manages microgrid operations, functionalities for utility interoperability, islanded operations, and transitions. (CMP-4)

Informational Note: MCS differ from multiple standby generators or UPSs that are evaluated and rated to operate as a single source of backup power upon loss of the primary power source. MCS functions include coordination, transitions, and interoperability between multiple power sources.

Microgrid Interconnect Device (MID).

A device that enables a microgrid system to operate in island mode while separated from a primary source and to reconnect to the primary power source. (CMP-4)

Informational Note: Microgrid controllers typically are used to measure and evaluate electrical parameters and provide the logic for the signal to initiate and complete transition processes. IEEE Std 2030.7-2017, *IEEE Standard for the Specification of Microgrid Controllers* , and IEEE Std 2030.8-2018, IEEE *Standard for the Testing of Microgrid Controllers* , provide information on microgrid controllers. IEEE Std 1547-2018, IEEE *Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces* , provides information on interconnection requirements.

Microgrid System

A system interconnected to an electric power production and distribution network or other primary power source capable of operating in parallel, that includes the ability to disconnect from the primary source and operate in island mode. (CMP-4)

Informational Note: The application of Article 705 to microgrid systems is limited by the exclusions in 90.2(B)(5) related to electric utilities. Additional information may be found in IEEE 1547, IEEE 2030.7, and IEEE 2030.8.

Mineral-Insulated, Metal-Sheathed Cable, Type MI.

A factory assembly of one or more conductors insulated with a highly compressed refractory mineral insulation and enclosed in a liquidtight and gastight continuous copper or alloy steel sheath. (CMP-6)

Minor Repair Garage.

A building or portions of a building used for lubrication, inspection, and minor automotive maintenance work, such as engine tune-ups, replacement of parts, fluid changes (e.g., oil, antifreeze, transmission fluid, brake fluid, air-conditioning refrigerants), brake system repairs, tire rotation, and similar routine maintenance work, including the associated floor space used for offices, parking, or showrooms. [**30A:** 3.3.12.2] (511) (CMP-14)

Mixer.

Equipment used to combine and level match a multiplicity of electronic signals, such as from microphones, electronic instruments, and recorded audio. (640) (CMP-12)

Mobile (as applied to nonmedical X-ray equipment).

X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled. (660) (CMP-12)

Mobile Equipment.

Equipment with electrical components that is suitable to be moved only with mechanical aids or is provided with wheels for movement by a person(s) or powered devices. (513) (CMP-14)

Mobile Home.

A factory-assembled structure or structures transportable in one or more sections that are built on a permanent chassis and designed to be used as a dwelling without a permanent foundation where connected to the required utilities and that include the plumbing, heating, air-conditioning, and electrical systems contained therein.

For the purpose of this *Code* and unless otherwise indicated, the term *mobile home* includes manufactured homes. (CMP-7)

Mobile Home Accessory Building or Structure.

Any awning, cabana, ramada, storage cabinet, carport, fence, windbreak, or porch established for the use of the occupant of the mobile home on a mobile home lot. (550) (CMP-7)

Mobile Home Lot.

A designated portion of a mobile home park designed for the accommodation of one mobile home and its accessory buildings or structures for the exclusive use of its occupants. (550) (CMP-7)

Mobile Home Park.

A contiguous parcel of land that is used for the accommodation of occupied mobile homes. (550) (CMP-7)

Module.

A complete, environmentally protected unit consisting of solar cells and other components designed to produce dc power. (690) (CMP-4)

Momentary Rating (as applied to nonmedical X-ray equipment).

A rating based on an operating interval that does not exceed 5 seconds. (660) (CMP-12)

Momentary Rating (Maximum Power).

A rating based on an operating interval that does not exceed 5 seconds. (CMP-15)

Monitor.

An electrical or electronic means to observe, record, or detect the operation or condition of the electric power system or apparatus. (750) (CMP-13)

Monopole Circuit.

An electrical subset of a PV system that has two conductors in the output circuit, one positive (+) and one negative (−). (690) (CMP-4)

Monorail.

Overhead track and hoist system for moving material around the boatyard or moving and launching boats. [**303:** 3.3.15] (555) (CMP-7)

Mooring(s).

Any place where a boat is wet stored or berthed. [**303:** 3.3.16] (555) (CMP-7)

Motion Picture Studio (Lot).

A building or group of buildings and other structures designed, constructed, or permanently altered for use by the entertainment industry for the purpose of motion picture or television production. (CMP-15)

Motor Control Center.

An assembly of one or more enclosed sections having a common power bus and principally containing motor control units. (CMP-11)

Motor Fuel Dispensing Facility.

That portion of a property where motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles or marine craft or into approved containers, including all equipment used in connection therewith. [**30A:** 3.3.11] (514) (CMP-14)

Informational Note: See 511.1 with respect to electrical wiring and equipment for other areas used as lubritoriums, service rooms, repair rooms, offices, salesrooms, compressor rooms, and similar locations.

Motor Home.

A vehicular unit designed to provide temporary living quarters for recreational, camping, or travel use built on or permanently attached to a self-propelled motor vehicle chassis or on a chassis cab or van that is an integral part of the completed vehicle. *(See Recreational Vehicle.)* (551) (CMP-7)

Multioutlet Assembly.

A surface, flush, or freestanding assemblage consisting of a raceway and fittings or other enclosure provided with one or more receptacles, for the purpose of supplying power to utilization equipment. (CMP-18)

Multi-Circuit Cable Outlet Enclosure.

An enclosure containing one or more multi-circuit plugs, receptacles, or both. (520) (CMP-15)

Nacelle.

An enclosure housing the alternator and other parts of a wind turbine. (694) (CMP-4)

Natural Bodies of Water.

Bodies of water such as lakes, streams, ponds, rivers, and other naturally occurring bodies of water, which may vary in depth throughout the year. (682) (CMP-17)

Neon Tubing.

Electric-discharge luminous tubing, including cold cathode luminous tubing, that is manufactured into shapes to illuminate signs, form letters, parts of letters, skeleton tubing, outline lighting, other decorative elements, or art forms and filled with various inert gases. (600) (CMP-18)

Network Interface Unit (NIU).

A device that converts a broadband signal into component voice, audio, video, data, and interactive services signals and provides isolation between the network power and the premises signal circuits. These devices often contain primary and secondary protectors. (CMP-16)

Network Terminal.

A device that converts network-provided signals (optical, electrical, or wireless) into component signals, including voice, audio, video, data, wireless, optical, and interactive services, and is considered a network device on the premises that is connected to a communications service provider and is powered at the premises. (CMP-16)

Neutral Conductor.

The conductor connected to the neutral point of a system that is intended to carry current under normal conditions. (CMP-5)

Neutral Point.

The common point on a wye-connection in a polyphase system or midpoint on a single-phase, 3-wire system, or midpoint of a single-phase portion of a 3-phase delta system, or a midpoint of a 3-wire, direct-current system. (CMP-5)

Informational Note: At the neutral point of the system, the vectorial sum of the nominal voltages from all other phases within the system that utilize the neutral, with respect to the neutral point, is zero potential.

Nominal Voltage (as applied to battery or cell).

The value assigned to a cell or battery of a given voltage class for the purpose of convenient designation. The operating voltage of the cell or battery may vary above or below this value. (CMP-13)

Informational Note: The most common nominal cell voltages are 2 volts per cell for the lead-acid batteries, 1.2 volts per cell for alkali batteries, and 3.2 to 3.8 volts per cell for Li-ion batteries. Nominal voltages might vary with different chemistries.

Nonautomatic.

Requiring human intervention to perform a function. (CMP-1)

Nonincendive Circuit.

A circuit, other than field wiring, in which any arc or thermal effect produced under intended operating conditions of the equipment, is not capable, under specified test conditions, of igniting the flammable gas–air, vapor–air, or dust–air mixture. (CMP-14)

Informational Note: See ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* , for further information.

Nonincendive Component.

A component having contacts for making or breaking an incendive circuit and the contacting mechanism is constructed so that the component is incapable of igniting the specified flammable gas–air or vapor–air mixture. The housing of such a component is not intended to exclude the flammable atmosphere or contain an explosion. (CMP-14)

Informational Note: For further information, see ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Divisions 1 and 2 Hazardous (Classified) Locations.*

Nonincendive Equipment.

Equipment having electrical/electronic circuitry that is incapable, under normal operating conditions, of causing ignition of a specified flammable gas–air, vapor–air, or dust–air mixture due to arcing or thermal means. (CMP-14)

Informational Note: For further information, see ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* .

Nonincendive Field Wiring.

Wiring that enters or leaves an equipment enclosure and, under normal operating conditions of the equipment, is not capable, due to arcing or thermal effects, of igniting the flammable gas–air, vapor–air, or dust–air mixture. Normal operation includes opening, shorting, or grounding the field wiring. (CMP-14)

Nonincendive Field Wiring Apparatus.

Apparatus intended to be connected to nonincendive field wiring. (500) (CMP-14)

Informational Note: For further information, see ANSI/UL 121207-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* .

Nonlinear Load.

A load where the wave shape of the steady-state current does not follow the wave shape of the applied voltage. (CMP-1)

Informational Note: Electronic equipment, electronic/electric-discharge lighting, adjustable-speed drive systems, and similar equipment may be nonlinear loads.

Nonmetallic-Sheathed Cable.

A factory assembly of two or more insulated conductors enclosed within an overall nonmetallic jacket. (CMP-6)

Nonmetallic-Sheathed Cable, Type NM.

Insulated conductors enclosed within an overall nonmetallic jacket. (CMP-6)

Nonmetallic-Sheathed Cable, Type NMC.

Insulated conductors enclosed within an overall, corrosion resistant, nonmetallic jacket. (CMP-6)

Nonmetallic Extension.

An assembly of two insulated conductors within a nonmetallic jacket or an extruded thermoplastic covering. The classification includes surface extensions intended for mounting directly on the surface of walls or ceilings. (CMP-6)

Nonprofessional Projector.

Those types of projectors that do not comply with the definition of *Professional-Type Projector* . (540) (CMP-15)

Non-Power-Limited Fire Alarm Circuit (NPLFA).

A fire alarm circuit powered by a source that complies with the requirements of 760.41 and 760.43. (CMP-3)

Nonsparking.

Constructed to minimize the risk of arcs or sparks capable of creating an ignition hazard during conditions of normal operation. (500) (CMP-14)

Informational Note: See ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* , for additional information.

Normal/Emergency Power Source.

A power source on the output side of a transfer switch or uninterruptible power supply that is automatically available upon loss of normal power. (700) (CMP-13).

Normal High Water Level (as applies to electrical datum plane distances).

An elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. (CMP-7)

Nurses' Station.

A space intended to provide a center of nursing activity for a group of nurses serving bed patients, where patient calls are received, nurses dispatched, nurses' notes written, inpatient charts prepared, and medications prepared for distribution to patients. Where such activities are carried on in more than one location within a nursing unit, all such separate spaces are considered a to be parts of the nurses' station. (517) (CMP-15)

Nursing Home.

A building or portion of a building used on a 24-hour basis for the housing and nursing care of four or more persons who, because of mental or physical incapacity, might be unable to provide for their own needs and safety without the assistance of another person. [***101*** **:** 3.3.150.2] (CMP-15)

Occupiable Space.

A room or enclosed space designed for human occupancy. (CMP-1)

Office Furnishing.

Cubicle panels, partitions, study carrels, workstations, desks, shelving systems, and storage units that may be mechanically and electrically interconnected to form an office furnishing system. (CMP-18)

Oil Immersion.

Electrical equipment immersed in a protective liquid so that an explosive atmosphere that might be above the liquid or outside the enclosure cannot be ignited. (500) (CMP-14)

Open Wiring on Insulators.

An exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings. (CMP-6)

Operating Device.

The car switch, pushbuttons, key or toggle switch(s), or other devices used to activate the operation controller. (620) (CMP-12)

Operator.

The individual responsible for starting, stopping, and controlling an amusement ride or supervising a concession. (525) (CMP-15)

Optical Radiation.

Electromagnetic radiation at wavelengths in vacuum between the region of transition to X-rays and the region of transition to radio waves that is approximately between 1 nm and 1000 µm. (CMP-14)

Informational Note: See ANSI/UL 60079-28-2017, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation* , for additional information on types of protection that can be applied to minimize the risk of ignition in explosive atmospheres from optical radiation in the wavelength range from 380 nm to 10 µm.

Optical System With Interlock “op sh”.

Type of protection to minimize the risk of ignition in explosive atmospheres from optical radiation where visible or infrared radiation is confined inside optical fiber or other transmission medium with interlock cutoff provided to reliably reduce the unconfined beam strength to safe levels within a specified time in case the confinement fails and the radiation becomes unconfined. (CMP-14)

Informational Note: See ANSI/UL 60079-28-2017, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation* , for additional information.

Optional Standby Systems.

Those systems intended to supply power to public or private facilities or property where life safety does not depend on the performance of the system. These systems are intended to supply on-site generated or stored power to selected loads either automatically or manually. (CMP-13)

Informational Note: Optional standby systems are typically installed to provide an alternate source of electric power for such facilities as industrial and commercial buildings, farms, and residences and to serve loads such as heating and refrigeration systems, data processing and communications systems, and industrial processes that, when stopped during any power outage, could cause discomfort, serious interruption of the process, damage to the product or process, or the like.

Organ, Electronic. (Electronic Organ)

A musical instrument that imitates the sound of a pipe organ by producing sound electronically. (CMP-12)

Informational Note: Most new electronic organs produce sound digitally and are called digital organs.

Organ, Pipe. (Pipe Organ)

A musical instrument that produces sound by driving pressurized air (called *wind*) through pipes selected via a keyboard. (CMP-12)

Outdoor Overhead Conductors.

Single conductors, insulated, covered, or bare, installed outdoors on support structures in free air. (399) (CMP-6)

Outdoor Spray Area.

A spray area that is outside the confines of a building or that has a canopy or roof that does not limit the dissipation of the heat of a fire or dispersion of flammable vapors and does not restrict fire-fighting access and control. For the purpose of this standard, an outdoor spray area can be treated as an unenclosed spray area. [**33:** 3.3.2.3.1] (516) (CMP-14)

Outlet.

A point on the wiring system at which current is taken to supply utilization equipment. (CMP-1)

Outlet Box Hood.

A housing shield intended to fit over a faceplate for flush-mounted wiring devices, or an integral component of an outlet box or of a faceplate for flush-mounted wiring devices. The hood does not serve to complete the electrical enclosure; it reduces the risk of water coming in contact with electrical components within the hood, such as attachment plugs, current taps, surge protective devices, direct plug-in transformer units, or wiring devices. (CMP-18)

Outline Lighting.

An arrangement of incandescent lamps, electric-discharge lighting, or other electrically powered light sources to outline or call attention to certain features such as the shape of a building or the decoration of a window. (CMP-18)

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). (625) (CMP-12)

Output Cable to the Primary Pad.

A multiconductor , 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. (625) (CMP-12)

Overcurrent.

Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload, short circuit, or ground fault. (CMP-10)

Informational Note: A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Therefore, the rules for overcurrent protection are specific for particular situations.

Overcurrent Protective Device, Branch-Circuit. (Branch-Circuit Overcurrent Protective Device)

A device capable of providing protection for service, feeder, and branch circuits and equipment over the full range of overcurrents between its rated current and its interrupting rating. Such devices are provided with interrupting ratings appropriate for the intended use but no less than 5000 amperes. (CMP-10)

Overcurrent Protective Device, Current-Limiting. (Current-Limiting Overcurrent Protective Device)

A device that, when interrupting currents in its current-limiting range, reduces the current flowing in the faulted circuit to a magnitude substantially less than that obtainable in the same circuit if the device were replaced with a solid conductor having comparable impedance. (240) (CMP-10)

Overcurrent Protective Device, Supplementary. (Supplementary Overcurrent Protective Device)

A device intended to provide limited overcurrent protection for specific applications and utilization equipment such as luminaires and appliances. This limited protection is in addition to the protection provided in the required branch circuit by the branch-circuit overcurrent protective device. (CMP-10)

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. (626) (CMP-12)

Overload.

Operation of equipment in excess of normal, full-load rating, or of a conductor in excess of its ampacity that, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (CMP-10)

Packaged Therapeutic Tub or Hydrotherapeutic Tank Equipment Assembly.

A factory-fabricated unit consisting of water-circulating, heating, and control equipment mounted on a common base, intended to operate a therapeutic tub or hydrotherapeutic tank. Equipment can include pumps, air blowers, heaters, lights, controls, sanitizer generators, and so forth. (680) (CMP-17)

Panelboard.

A single panel or group of panel units designed for assembly in the form of a single panel, including buses and automatic overcurrent devices, and equipped with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet, enclosure, or cutout box placed in or against a wall, partition, or other support; and accessible only from the front or, where placed within a floor-mounted commercial appliance outlet center, from the top. (CMP-9)

Panelboard, Enclosed. (Enclosed Panelboard)

An assembly of buses and connections, overcurrent devices, and control apparatus with or without switches or other equipment, installed in a suitable cabinet, cutout box, or enclosure suitable for a panelboard application. (CMP-1)

Park Electrical Wiring Systems.

All of the electrical wiring, luminaires, equipment, and appurtenances related to electrical installations within a mobile home park, including the mobile home service equipment. (550) (CMP-7)

Park Trailer.

A unit that is built on a single chassis mounted on wheels and has a gross trailer area not exceeding 37 m^2 (400 ft^2) in the set-up mode. (552) (CMP-7)

Part-Winding Motors.

A part-winding start induction or synchronous motor is one that is arranged for starting by first energizing part of its primary (armature) winding and, subsequently, energizing the remainder of this winding in one or more steps. A standard part-winding start induction motor is arranged so that one-half of its primary winding can be energized initially, and, subsequently, the remaining half can be energized, both halves then carrying equal current. (CMP 11)

Informational Note: A hermetic refrigerant motor-compressor is not considered a standard part-winding start induction motor.

Patient Bed Location.

The location of a patient sleeping bed, or the bed or procedure table of a Category 1 space. [**99:** 3.3.138] (CMP-15)

Patient Care–Related Electrical Equipment.

Electrical equipment appliance that is intended to be used for diagnostic, therapeutic, or monitoring purposes in a patient care vicinity. [**99:** 3.3.139] (517) (CMP-15)

Patient Care Space.

Any space of a health care facility wherein patients are intended to be examined or treated. [**99:** 3.3.140] (517) (CMP-15)

Informational Note No. 1: The health care facility's governing body designates patient care space in accordance with the type of patient care anticipated.

Informational Note No. 2: Business offices, corridors, lounges, day rooms, dining rooms, or similar areas typically are not classified as patient care spaces. [**99:** A.3.3.140]

Category 1 Space (as applied to patient care space).

Space in which failure of equipment or a system is likely to cause major injury or death of patients, staff, or visitors. [**99:** 3.3.140.1] (CMP-15)

Informational Note: These spaces, formerly known as critical care rooms, are typically where patients are intended to be subjected to invasive procedures and connected to line-operated, patient care–related appliances. Examples include, but are not limited to, special care patient rooms used for critical care, intensive care, and special care treatment rooms such as angiography laboratories, cardiac catheterization laboratories, delivery rooms, operating rooms, post-anesthesia care units, trauma rooms, and other similar rooms. [**99:** A.3.3.140.1]

Category 2 Space (as applied to patient care space).

Space in which failure of equipment or a system is likely to cause minor injury to patients, staff, or visitors. [**99:** 3.3.140.2] (CMP-15)

Informational Note: These spaces were formerly known as general care rooms. Examples include, but are not limited to, inpatient bedrooms, dialysis rooms, in vitro fertilization rooms, procedural rooms, and similar rooms. [**99:** A.3.3.140.2]

Category 3 Space (as applied to patient care space).

Space in which the failure of equipment or a system is not likely to cause injury to patients, staff, or visitors but can cause discomfort. [**99:** 3.3.140.3] (517) (CMP-15)

Informational Note: These spaces, formerly known as basic care rooms, are typically where basic medical or dental care, treatment, or examinations are performed. Examples include, but are not limited to, examination or treatment rooms in clinics, medical and dental offices, nursing homes, and limited care facilities. [**99:** A.3.3.140.3]

Category 4 Space (as applied to patient care space).

Space in which failure of equipment or a system is not likely to have a physical impact on patient care. [**99:** 3.3.140.4] (517) (CMP-15)

Informational Note: These spaces were formerly known as support rooms. Examples of support spaces include, but are not limited to, anesthesia work rooms, sterile supply, laboratories, morgues, waiting rooms, utility rooms, and lounges. [**99:** A.3.3.140.4]

Patient Care Vicinity.

A space, within a location intended for the examination and treatment of patients, extending 1.8 m (6 ft) beyond the normal location of the bed, chair, table, treadmill, or other device that supports the patient during examination and treatment and extending vertically to 2.3 m (7 ft 6 in.) above the floor. [**99:** 3.3.141] (517) (CMP-15)

Patient Equipment Grounding Point.

A jack or terminal that serves as the collection point for redundant grounding of electric appliances serving a patient care vicinity or for grounding other items in order to eliminate electromagnetic interference problems. [**99:** 3.3.142] (517) (CMP-15)

Performance Area.

The stage and audience seating area associated with a temporary stage structure, whether indoors or outdoors, constructed of scaffolding, truss, platforms, or similar devices, that is used for the presentation of theatrical or musical productions or for public presentations. (520) (CMP-15)

Permanent Amusement Attraction.

A ride device, entertainment device, or a combination of both that is installed such that portability or relocation is impracticable. (522) (CMP-15)

Permanently Installed Decorative Fountains and Reflection Pools.

Those that are constructed in the ground, on the ground, or in a building in such a manner that the fountain cannot be readily disassembled for storage, whether or not served by electrical circuits of any nature. These units are primarily constructed for their aesthetic value and are not intended for swimming or wading. (680) (CMP-17)

Personnel Protection System (as applied to EVSE).

A system of personnel protection devices and constructional features that when used together provide protection against electric shock of personnel. (625) (CMP-12)

Photovoltaic (PV) Powered Sign.

A complete sign powered by solar energy consisting of all components and subassemblies for installation either as an off-grid stand-alone, on-grid interactive, or non-grid interactive system. (600) (CMP-18)

Photovoltaic (PV) System.

The total components, circuits, and equipment up to and including the PV system disconnecting means that, in combination, convert solar energy into electric energy. (CMP-4)

Pier.

A structure extending over the water and supported on a fixed foundation (fixed pier), or on flotation (floating pier), that provides access to the water. [**303:** 3.3.17] (CMP-7)

Pier, Fixed.

Pier constructed on a permanent, fixed foundation, such as on piles, that permanently establishes the elevation of the structure deck with respect to land. [**303:** 3.3.17.2] (CMP-7)

Pier, Floating.

Pier designed with inherent flotation capability that allows the structure to float on the water surface and rise and fall with water level changes. [**303:** 3.3.17.3] (CMP-7)

Pipe Organ 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. (CMP-12)

Informational Note: The pipe organ sounding apparatus is also referred to as the *pipe organ chamber*.

Phase, Manufactured. (Manufactured Phase)

The phase that originates at the phase converter and is not solidly connected to either of the single-phase input conductors. (CMP-13)

Phase Converter.

An electrical device that converts single-phase power to 3-phase electric power. (CMP-13)

Informational Note: Phase converters have characteristics that modify the starting torque and locked-rotor current of motors served, and consideration is required in selecting a phase converter for a specific load.

Phase Converter, Rotary. (Rotary-Phase Converter)

A device that consists of a rotary transformer and capacitor panel(s) that permits the operation of 3-phase loads from a single-phase supply. (455) (CMP-13)

Phase Converter, Static. (Static-Phase Converter)

A device without rotating parts, sized for a given 3-phase load to permit operation from a single-phase supply. (455) (CMP-13)

Pipeline.

A length of pipe including pumps, valves, flanges, control devices, strainers, and/or similar equipment for conveying fluids. (CMP-17)

Plenum.

A compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system. (CMP-3)

Plugging Box.

A dc device consisting of one or more 2-pole, 2-wire, nonpolarized, nongrounding-type receptacles intended to be used on dc circuits only. (530) (CMP-15)

Point of Entrance.

The point within a building at which the wire or cable emerges from an external wall, from the roof, or from a concrete floor slab. (CMP-16)

Point of Entrance (Point of Entrance Optical Fiber Cable).

The point within a building at which the optical fiber cable emerges from an external wall or from a concrete floor slab. (CMP-16)

Pool.

Manufactured or field-constructed equipment designed to contain water on a permanent or semipermanent basis and used for swimming, wading, immersion, or therapeutic purposes. (680) (CMP-17)

Pool, Immersion. (Immersion Pool)

A pool for ceremonial or ritual immersion of users, which is designed and intended to have its contents drained or discharged. (680) (CMP-17)

Pool, Permanently Installed Swimming, Wading, Immersion, and Therapeutic. (Permanently Installed Swimming, Wading, Immersion, and Therapeutic Pools)

Those that are constructed or installed in the ground or partially in the ground, and all pools installed inside of a building, whether or not served by electrical circuits of any nature. (680) (CMP-17)

Pool Cover, Electrically Operated.

Motor-driven equipment designed to cover and uncover the water surface of a pool by means of a flexible sheet or rigid frame. (680) (CMP-17)

Portable.

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

Portable (as applied to equipment).

Equipment that is actually moved or can easily be moved from one place to another in normal use. (680) (CMP-17)

Portable (as applied to nonmedical X-ray equipment).

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

Portable Equipment.

Equipment intended to be moved from one place to another. (530) (CMP-15)

Portable Equipment.

Equipment with electrical components suitable to be moved by a single person without mechanical aids. (511) (CMP-14)

Portable Equipment.

Equipment fed with portable cords or cables intended to be moved from one place to another. (520) (CMP-15)

Portable Power Distribution Unit.

A power distribution box containing receptacles and overcurrent devices. (520) (CMP-15)

Informational Note: See ANSI/UL 1640, *Portable Power-Distribution Equipment* , for information on portable power distribution units.

Portable Structures.

Units designed to be moved including, but not limited to, amusement rides, attractions, concessions, tents, trailers, trucks, and similar units. (525) (CMP-15)

Powder Filling "q".

Type of protection where electrical parts capable of igniting an explosive atmosphere are fixed in position and completely surrounded by filling material (glass or quartz powder) to prevent the ignition of an external explosive atmosphere. (505) (CMP-14)

Informational Note: See ANSI/UL 60079-5-2016, *Explosive Atmospheres — Part 5: Equipment protection by powder filling "q".*

Power-Limited Fire Alarm Circuit (PLFA).

A fire alarm circuit powered by a source that complies with the requirements of 760.121. (CMP-3)

Power-Supply Assembly.

The conductors, including ungrounded, grounded, and equipment grounding conductors, the connectors, attachment plug caps, and all other fittings, grommets, or devices installed for the purpose of delivering energy from the source of electrical supply to the distribution panel within the recreational vehicle. (551) (CMP-7)

Power-Supply Cord.

A length of flexible cord with an attachment plug at one end and individual cord conductors not terminated in a cord connector at the opposite end. (CMP-6)

Power-Supply Cord (as applied to EVSE).

An assembly consisting of an attachment plug and length of flexible cord that connects equipment to a receptacle. (625) (CMP-12)

Power and Control Tray Cable, Type TC.

A factory assembly of two or more insulated conductors, with or without associated bare or covered equipment grounding conductors, under a nonmetallic jacket. (CMP-6)

Power Outlet.

An enclosed assembly that may include receptacles, circuit breakers, fuseholders, fused switches, buses, and watt-hour meter mounting means; intended to supply and control power to mobile homes, recreational vehicles, park trailers, or boats or to serve as a means for distributing power required to operate mobile or temporarily installed equipment. (CMP-7)

Power Outlet, Marina.

An enclosed assembly that can include equipment such as receptacles, circuit breakers, fused switches, fuses, a watt-hour meter(s), panelboards, and monitoring means identified for marina use. [**303:** 3.3.13] (555) (CMP-7)

Power Production Equipment.

Electrical generating equipment supplied by any source other than a utility service, up to the source system disconnecting means. (CMP-4)

Informational Note: Examples of power production equipment include such items as generators, solar photovoltaic systems, and fuel cell systems.

Power Source Output Circuit.

The conductors between power production equipment and the service or other systems. (CMP-4)

Power Supply.

A Class 2 power supply connected between the branch-circuit power distribution system and the busbar low-voltage suspended ceiling power distribution system. (393) (CMP-18)

Power-Limited Tray Cable (PLTC).

A factory assembly of two or more insulated conductors rated at 300 volts, with or without associated bare or insulated equipment grounding conductors, under a nonmetallic jacket. (CMP-3)

Premises-Powered.

Using power provided locally from the premises. (CMP-16)

Premises Wiring (System).

Interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all their associated hardware, fittings, and wiring devices, both permanently and temporarily installed. This includes (a) wiring from the service point or power source to the outlets or (b) wiring from and including the power source to the outlets where there is no service point.

Such wiring does not include wiring internal to appliances, luminaires, motors, controllers, motor control centers, and similar equipment. (CMP-1)

Informational Note: Power sources include, but are not limited to, interconnected or stand-alone batteries, solar photovoltaic systems, other distributed generation systems, or generators.

Pressurized.

The process of supplying an enclosure with a protective gas with or without continuous flow at sufficient pressure to prevent the entrance of combustible dust or ignitible fibers/flyings. (CMP-14)

Pressurized Enclosure "p".

Type of protection for electrical equipment that uses the technique of guarding against the ingress of the external atmosphere, which might be explosive, into an enclosure by maintaining a protective gas therein at a pressure above that of the external atmosphere. (CMP-14)

Informational Note: See ANSI/UL-60079-2-2017, *Explosive Atmospheres — Part 2: Equipment protection by pressurized enclosures "p"*.

Pressurized Room "p".

A room volume protected by pressurization and of sufficient size to permit the entry of a person who might occupy the room. (CMP-14)

Informational Note: See ANSI/UL 60079-13-2020, *Explosive Atmospheres — Part 13: Equipment protection by pressurized room "p" and artificially ventilated room "v"*, for requirements for rooms intended for human entry where pressurization is used as a means of reducing the risk of explosion.

Primary DC Source.

A source that supplies the majority of the dc load in a dc microgrid. (712) (CMP-13)

Primary Pad.

A device external to the EV that transfers power via the contactless coupling as part of a wireless power transfer system. (625) (CMP-12)

Primary Source.

An electric utility or another source of power that acts as the main forming and stabilizing source in an electric power system. (CMP-4)

Prime Mover.

The machine that supplies the mechanical horsepower to a generator. (CMP-13)

Premises.

The land and buildings of a user located on the user side of the utility-user network point of demarcation. (800) (CMP-16)

Process Seal.

A seal between electrical systems and flammable or combustible process fluids where a failure could allow the migration of process fluids into the premises' wiring system. (CMP-14)

Professional-Type Projector.

A type of projector using 35- or 70-mm film that has a minimum width of 35 mm (1 **3**/**8** in.) and has on each edge 212 perforations per meter (5.4 perforations per inch), or a type using carbon arc, xenon, or other light source equipment that develops hazardous gases, dust, or radiation. (540) (CMP-15)

Proscenium.

The wall and arch that separates the stage from the auditorium (i.e., house). (520) (CMP-15)

Protected Optical Fiber Cable.

Optical fiber cable protected from releasing optical radiation into the atmosphere during normal operating conditions and foreseeable malfunctions by additional armoring, conduit, cable tray, or raceway. (CMP-14)

Informational Note: See ANSI/UL 60079-28-2017, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation*.

Protected Optical Radiation "op pr".

Type of protection to minimize the risk of ignition in explosive atmospheres from optical radiation where visible or infrared radiation is confined inside optical fiber or other transmission medium under normal constructions or constructions with additional mechanical protection based on the assumption that there is no escape of radiation from the confinement. (CMP-14)

Informational Note: See ANSI/UL 60079-28-2017, *Explosive Atmospheres — Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation*.

Protection by Enclosure "t".

Type of protection for explosive dust atmospheres where electrical equipment is provided with an enclosure providing dust ingress protection and a means to limit surface temperatures. (506) (CMP-14)

Informational Note: See ANSI/UL 60079-31-2015, *Explosive Atmospheres — Part 31: Equipment Dust Ignition Protection by Enclosure "t"*, for additional information.

Psychiatric Hospital.

A building used exclusively for the psychiatric care, on a 24-hour basis, of four or more inpatients. (517) (CMP-15)

Purged and Pressurized.

The process of (1) purging, supplying an enclosure with a protective gas at a sufficient flow and positive pressure to reduce the concentration of any flammable gas or vapor initially present to an acceptable level; and (2) pressurization, supplying an enclosure with a protective gas with or without continuous flow at sufficient pressure to prevent the entrance of a flammable gas or vapor, a combustible dust, or an ignitible fiber. (CMP-14)

Informational Note: See NFPA 496-2021, *Standard for Purged and Pressurized Enclosures for Electrical Equipment*, for additional information.

PV DC Circuit, Source. (PV Source Circuit)

The dc circuit conductors between modules in a PV string circuit, and from PV string circuits to dc combiners, electronic power converters, or a dc PV system disconnecting means. (690) (CMP-4)

PV DC Circuit, String. (PV String Circuit)

The PV source circuit conductors of one or more series-connected PV modules. (690) (CMP-4)

PV DC Circuit (PV System DC Circuit).

Any dc conductor in PV source circuits, PV string circuits, and PV dc-to-dc converter circuits. (690) (CMP-4)

Qualified Person.

One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved. (CMP-1)

Informational Note: Refer to *NFPA 70E* -2018, *Standard for Electrical Safety in the Workplace* , for electrical safety training requirements.

Raceway.

An enclosed channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this *Code* . (CMP-8)

Informational Note: A raceway is identified within specific article definitions.

Raceway, Cellular Metal Floor. (Cellular Metal Floor Raceway)

The hollow spaces of cellular metal floors, together with suitable fittings, that may be approved as enclosed channel for electrical conductors. (CMP-8)

Raceway, Communications. (Communications Raceway)

An enclosed channel of nonmetallic materials designed expressly for holding communications wires and cables; optical fiber cables; data cables associated with information technology and communications equipment; Class 2, Class 3, and Type PLTC cables; and power-limited fire alarm cables in plenum, riser, and general-purpose applications. (CMP-16)

Raceway, Strut-Type Channel. (Strut-Type Channel Raceway)

A metal raceway that is intended to be mounted to the surface of or suspended from a structure, with associated accessories for the installation of electrical conductors and cables. (CMP-8)

Raceway, Surface Metal. (Surface Metal Raceway)

A metal raceway that is intended to be mounted to the surface of a structure, with associated couplings, connectors, boxes, and fittings for the installation of electrical conductors. (CMP-8)

Raceway, Surface Nonmetallic. (Surface Nonmetallic Raceway)

A nonmetallic raceway that is intended to be mounted to the surface of a structure, with associated couplings, connectors, boxes, and fittings for the installation of electrical conductors. (CMP-8)

Raceway, Underfloor. (Underfloor Raceway)

A raceway and associated components designed and intended for installation beneath or flush with the surface of a floor for the installation of cables and electrical conductors. (CMP-8)

Rainproof.

Constructed, protected, or treated so as to prevent rain from interfering with the successful operation of the apparatus under specified test conditions. (CMP-1)

Raintight.

Constructed or protected so that exposure to a beating rain will not result in the entrance of water under specified test conditions. (CMP-1)

Rail.

The structural support for the suspended ceiling system typically forming the ceiling grid supporting the ceiling tile and listed utilization equipment, such as sensors, actuators, A/V devices, and low-voltage luminaires and similar electrical equipment. (393) (CMP-18)

Rated-Load Current (RLC) (as applied to air-conditioning and refrigerating equipment).

The current of a hermetic refrigerant motor-compressor resulting when it is operated at the rated load, rated voltage, and rated frequency of the equipment it serves. (440) (CMP-11)

Rated Output Power.

The amplifier manufacturer's stated or marked output power capability into its rated load. (640) (CMP-12)

Rated Power.

The output power of a wind turbine at its rated wind speed. (694) (CMP-4)

Informational Note: The method for measuring wind turbine power output is specified in IEC 61400-12-1, *Power Performance Measurements of Electricity Producing Wind Turbines* .

Receptacle.

A contact device installed at the outlet for the connection of an attachment plug, or for the direct connection of electrical utilization equipment designed to mate with the corresponding contact device. A single receptacle is a single contact device with no other contact device on the same yoke or strap. A multiple receptacle is two or more contact devices on the same yoke or strap. (CMP-18)

Informational Note: A duplex receptacle is an example of a multiple receptacle that has two receptacles on the same yoke or strap.

Receptacle, Weight Supporting Ceiling (WSCR).

A contact device installed at the outlet box for the connection and support of luminaries and paddle fans using a weight supporting attachment fitting (WASF). (CMP-18)

Receptacle Outlet.

An outlet where one or more receptacles are installed. (CMP-18)

Reconditioned.

Electromechanical systems, equipment, apparatus, or components that are restored to operating conditions. This process differs from normal servicing of equipment that remains within a facility, or replacement of listed equipment on a one-to-one basis. (CMP-10)

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

Recreational Vehicle.

A vehicle or slide-in camper that is primarily designed as temporary living quarters for recreational, camping, or seasonal use; has its own motive power or is mounted on or towed by another vehicle; is regulated by the National Highway Traffic Safety Administration as a vehicle or vehicle equipment; does not require a special highway use permit for operation on the highways; and can be easily transported and set up on a daily basis by an individual. [**1192:** 3.3.53] (551) (CMP-7)

Informational Note: The basic entities are travel trailer, camping trailer, truck camper, and motor home as referenced in NFPA 1192-2021, *Standard on Recreational Vehicles*. See 3.3.52, *Recreational Vehicle*, and A.3.3.52 of NFPA 1192.

Recreational Vehicle Park.

Any parcel or tract of land under the control of any person, organization, or governmental entity wherein two or more recreational vehicle, recreational park trailer, and/or other camping sites are offered for use by the public or members of an organization for overnight stays. (551) (CMP-7)

Recreational Vehicle Site.

A specific area within a recreational vehicle park or campground that is set aside for use by a camping unit. (551) (CMP-7)

Recreational Vehicle Site Supply Equipment.

The necessary equipment, usually a power outlet, consisting of a circuit breaker or switch and fuse and their accessories, located near the point of entrance of supply conductors to a recreational vehicle site and intended to constitute the disconnecting means for the supply to that site. (551) (CMP-7)

Recreational Vehicle Stand.

That area of a recreational vehicle site intended for the placement of a recreational vehicle. (551) (CMP-7)

Reference Grounding Point.

The ground bus of the panelboard or isolated power system panel supplying the patient care room. [**99:** 3.3.158] (517) (CMP-15)

Relative Analgesia.

A state of sedation and partial block of pain perception produced in a patient by the inhalation of concentrations of nitrous oxide insufficient to produce loss of consciousness (conscious sedation). (517) (CMP-15)

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

An emergency lighting control device used to set normally dimmed or normally-off switched emergency lighting equipment to full power illumination levels in the event of a loss of the normal supply by bypassing the dimming/switching controls, and to return the emergency lighting equipment to normal status when the device senses the normal supply has been restored. (700) (CMP-13)

Informational Note: See ANSI/UL 924, Emergency Lighting and Power Equipment, for the requirements covering automatic load control relays.

Remote-Control Circuit, Branch Circuit.

A branch circuit that controls any other branch circuit through a relay or an equivalent device. (CMP-3)

Remote-Control Circuit, Power-Limited.

Any power-limited electrical circuit that controls any other circuit through a relay or an equivalent device. (CMP-3)

Remote Disconnect Control.

An electric device and circuit that controls a disconnecting means through a relay or equivalent device. (645) (CMP-12)

Resistance Heating Element.

A specific separate element to generate heat that may be externally attached to, embedded in, integrated with, or internal to the object to be heated. (CMP-17)

Informational Note: Tubular heaters, strip heaters, heating cable, heating tape, heating blankets, immersion heaters, and heating panels are examples of resistance heaters.

Retrofit Kit.

A general term for a complete subassembly of parts and devices for field conversion of utilization equipment. (CMP-18)

Retrofit Kit, General Use.

A kit consisting of primary parts, which does not include all the parts for a complete subassembly but includes a list of required parts and installation instructions to complete the subassembly in the field. (600) (CMP-18)

Retrofit Kit, Sign Specific.

A kit consisting of the necessary parts and hardware to allow for field installation in a host sign, based on the included installation instructions. (600) (CMP-18)

Reverse Polarity Protection (Backfeed Protection).

A system that prevents two interconnected power supplies, connected positive to negative, from passing current from one power source into a second power source. (393) (CMP-18)

Ride Device.

A device or combination of devices that carry, convey, or direct a person(s) over or through a fixed or restricted course within a defined area for the primary purpose of amusement or entertainment. (522) (CMP-15)

Safe Zone (as applied to capacitors).

Low probability of damage other than a slight swelling of the capacitor case, as identified by the case rupture curve of the capacitor. (460) (CMP-11)

Safety Circuit.

The part of a control system containing one or more devices that perform a safety-related function. [**79:** 3.3.95] (670) (CMP-12)

Informational Note: See NFPA 79-2021, *Electrical Standard for Industrial Machinery. Safety-related control system* and *safety interlock circuit* are common terms that can be used to refer to the safety circuit in other standards. The safety circuit can include hard-wired, communication, and software-related components.

Sealable Equipment.

Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. (CMP-1)

Informational Note: The equipment may or may not be operable without opening the enclosure.

Sealed [as applied to hazardous (classified) locations].

Constructed such that equipment is sealed effectively against entry of an external atmosphere and is not opened during normal operation or for any maintenance activities. (CMP-14)

Informational Note: See ANSI/UL 121201-2017, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2, and Class III, Divisions 1 and 2 Hazardous (Classified) Locations* , for additional information.

Section Sign.

A sign or outline lighting system, shipped as subassemblies, that requires field-installed wiring between the subassemblies to complete the overall sign. The subassemblies are either physically joined to form a single sign unit or are installed as separate remote parts of an overall sign. (600) (CMP-18)

Selected Receptacles.

A minimal number of receptacles selected by the health care facility's governing body as necessary to provide essential patient care and facility services during loss of normal power. [**99:** 3.3.164] (517) (CMP-15)

Self-Contained Therapeutic Tubs or Hydrotherapeutic Tanks.

A factory-fabricated unit consisting of a therapeutic tub or hydrotherapeutic tank with all water-circulating, heating, and control equipment integral to the unit. Equipment may include pumps, air blowers, heaters, light controls, sanitizer generators, and so forth. (680) (CMP-17)

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. (626) (CMP-12)

Separately Derived System.

An electrical power supply output, other than a service, having no direct connection(s) to circuit conductors of any other electrical source other than those established by grounding and bonding connections. (CMP-5)

Service.

The conductors and equipment connecting the serving utility to the wiring system of the premises served. (CMP-10)

Service Cable.

Service conductors made up in the form of a cable. (CMP-10)

Service Conductors.

The conductors from the service point to the service disconnecting means. (CMP-10)

Service Conductors, Overhead. (Overhead Service Conductors)

The overhead conductors between the service point and the first point of connection to the service-entrance conductors at the building or other structure. (CMP-10)

Service Conductors, Underground. (Underground Service Conductors)

The underground conductors between the service point and the first point of connection to the service-entrance conductors in a terminal box, meter, or other enclosure, inside or outside the building wall. (CMP-10)

Informational Note: Where there is no terminal box, meter, or other enclosure, the point of connection is considered to be the point of entrance of the service conductors into the building.

Service Drop.

The overhead conductors between the serving utility and the service point. (CMP-10)

Service-Entrance Cable.

A single conductor or multiconductor cable provided with an overall covering, primarily used for services, and of the following types:

Type SE.

Service-entrance cable having a flame-retardant, moisture-resistant covering.

Type USE.

Service-entrance cable, identified for underground use, having a moisture-resistant covering, but not required to have a flame-retardant covering.

(CMP-6)

Service-Entrance Conductor Assembly.

Multiple single-insulated conductors twisted together without an overall covering, other than an optional binder intended only to keep the conductors together. (CMP-6)

Service-Entrance Conductors, Overhead System.

The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop or overhead service conductors. (CMP-10)

Service-Entrance Conductors, Underground System.

The service conductors between the terminals of the service equipment and the point of connection to the service lateral or underground service conductors. (CMP-10)

Informational Note: Where service equipment is located outside the building walls, there may be no service-entrance conductors or they may be entirely outside the building.

Service Equipment.

The necessary equipment, consisting of a circuit breaker(s) or switch(es) and fuse(s) and their accessories, connected to the serving utility and intended to constitute the main control and disconnect of the serving utility. (CMP-10)

Service Equipment, Mobile Home. (Mobile Home Service Equipment)

The equipment containing the disconnecting means, overcurrent protective devices, and receptacles or other means for connecting a mobile home feeder assembly. (550) (CMP-7)

Service Lateral.

The underground conductors between the utility electric supply system and the service point. (CMP-10)

Service Point.

The point of connection between the facilities of the serving utility and the premises wiring. (CMP-10)

Informational Note: The service point can be described as the point of demarcation between where the serving utility ends and the premises wiring begins. The serving utility generally specifies the location of the service point based on the conditions of service.

Servicing.

The process of following a manufacturer's set of instructions to analyze, adjust, or perform prescribed actions upon equipment with the intention to preserve or restore the operational performance of the equipment. (CMP-1)

Informational Note: Servicing often encompasses maintenance and repair activities.

Shore Power.

The electrical equipment required to power a floating vessel including, but not limited to, the receptacle and cords. (555) (CMP-7)

Shoreline.

The farthest extent of standing water under the applicable conditions that determine the electrical datum plane for the specified body of water. (682) (CMP-17)

Short Circuit.

An abnormal connection (including an arc) of relatively low impedance, whether made accidentally or intentionally, between two or more points of different potential. (CMP-10)

Short-Circuit Current Rating.

The prospective symmetrical fault current at a nominal voltage to which an apparatus or system is able to be connected without sustaining damage exceeding defined acceptance criteria. (CMP-10)

Show Window.

Any window, including windows above doors, used or designed to be used for the display of goods or advertising material, whether it is fully or partly enclosed or entirely open at the rear and whether or not it has a platform raised higher than the street floor level. (CMP-2)

Sign Body.

A portion of a sign that may provide protection from the weather but is not an electrical enclosure. (600) (CMP-18)

Signaling Circuit, Branch Circuit.

Any branch circuit that energizes signaling equipment. (CMP-3)

Signaling Circuit, Power-Limited.

Any power-limited electrical circuit that energizes signaling equipment. (CMP-3)

Simple Apparatus.

An electrical component or combination of components of simple construction with well-defined electrical parameters that does not generate more than 1.5 volts, 100 mA, and 25 mW, or a passive component that does not dissipate more than 1.3 watts and is compatible with the intrinsic safety of the circuit in which it is used. (CMP-14)

Informational Note No. 1: The following are examples of simple apparatus:

(1) Passive components; for example, switches, instrument connectors, plugs and sockets, junction boxes, resistance temperature devices, and simple semiconductor devices such as LEDs

(2) Sources of stored energy consisting of single components in simple circuits with well-defined parameters; for example, capacitors or inductors, whose values are considered when determining the overall safety of the system

(3) Sources of generated energy; for example, thermocouples and photocells, that do not generate more than 1.5 volts, 100 mA, and 25 mW

Informational Note No. 2: See ANSI/UL 913-2013, *Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, and III, Division 1, Hazardous (Classified) Locations* ; and ANSI/UL 60079-11-2013, *Explosive Atmospheres — Part 11: Equipment Protection by Intrinsic Safety "i"* , for additional information.

Single-Pole Separable Connector.

A device that is installed at the ends of portable, flexible, single-conductor cable that is used to establish connection or disconnection between two cables or one cable and a single-pole, panel-mounted separable connector. (CMP-18)

Site-Isolating Device.

A disconnecting means installed at the distribution point for the purposes of isolation, system maintenance, emergency disconnection, or connection of optional standby systems. (547) (CMP-7)

Skeleton Tubing.

Neon tubing that is itself the sign or outline lighting and is not attached to an enclosure or sign body. (600) (CMP-18)

Slip.

A berthing space between or adjacent to piers, wharves, or docks; the water areas associated with boat occupation. *(See also Berth.)* [**303:** 3.3.20] (555) (CMP-7)

Solar Cell.

The basic PV device that generates electricity when exposed to light. (CMP-4)

Solid-State Phase-Control Dimmer.

A solid-state dimmer where the wave shape of the steady-state current does not follow the wave shape of the applied voltage such that the wave shape is nonlinear. (CMP-15)

Solid-State Sine Wave Dimmer.

A solid-state dimmer where the wave shape of the steady-state current follows the wave shape of the applied voltage such that the wave shape is linear. (CMP-15)

Spa or Hot Tub.

A hydromassage pool, or tub for recreational or therapeutic use, not located in health care facilities, designed for immersion of users, and usually having a filter, heater, and motor-driven blower. It may be installed indoors or outdoors, on the ground or supporting structure, or in the ground or supporting structure. Generally, a spa or hot tub is not designed or intended to have its contents drained or discharged after each use. (680) (CMP-17)

Spa or Hot Tub, Packaged Equipment Assembly (Packaged Spa or Hot Tub Equipment Assembly).

A factory-fabricated unit consisting of water-circulating, heating, and control equipment mounted on a common base, intended to operate a spa or hot tub. Equipment can include pumps, air blowers, heaters, lights, controls, sanitizer generators, and so forth. (680) (CMP-17)

Spa or Hot Tub, Self-Contained (Self-Contained Spa or Hot Tub).

Factory-fabricated unit consisting of a spa or hot tub vessel with all water-circulating, heating, and control equipment integral to the unit. Equipment can include pumps, air blowers, heaters, lights, controls, sanitizer generators, and so forth. (680) (CMP-17)

Space.

A portion of the health care facility designated by the health care facility's governing body that serves a specific purpose. [**99:** 3.3.171] (517) (CMP-15)

Special Permission.

The written consent of the authority having jurisdiction. (CMP-1)

Special Protection "s".

Type of protection that permits design, assessment, and testing of equipment that cannot be fully assessed within a recognized type of protection or combination of recognized types of protection because of functional or operational limitations, but that can be demonstrated to provide the necessary equipment protection level (EPL).

Informational Note No. 1: Special protection "s" under the Zone system is equivalent in concept to other protection techniques under the Division system as described in 500.7(U).

Informational Note No. 2: Type of protection "s" is only intended for equipment that is outside the scope of other ANSI/UL 60079 series type of protection standards.

Special-Purpose Multi-Circuit Cable System.

A portable branch-circuit distribution system consisting of one or more trunk cables and optional breakout assemblies or multi-circuit outlet enclosures. (520) (CMP-15)

Spider (Cable Splicing Block).

A device that contains busbars that are insulated from each other for the purpose of splicing or distributing power to portable cables and cords that are terminated with single-pole busbar connectors. (530) (CMP-15)

Spin Down.

A shutdown condition of the FESS, where energy is being dissipated and the flywheel rotor is slowing down to a stop. (706) (CMP-13)

Informational Note: A complete stop of a flywheel rotor cannot occur instantaneously because of the high kinetic energy of the rotor, but rather occurs over time as a result of friction forces acting on the rotor.

Splash Pad.

A fountain intended for recreational use by pedestrians and designed to contain no more than 25 mm (1 in.) of water depth. This definition does not include showers intended for hygienic rinsing prior to use of a pool, spa, or other water feature. (680) (CMP-17)

Spray Area.

Any fully enclosed, partly enclosed, or unenclosed area in which dangerous quantities of flammable or combustible vapors, mists, residues, dusts, or deposits are present due to the operation of spray processes, including (1) any area in the direct path of a spray application process; (2) the interior of a spray booth, spray room, or limited finishing workstation, as herein defined; (3) the interior of any exhaust plenum, eliminator section, or scrubber section; (4) the interior of any exhaust duct or exhaust stack leading from a spray application process; (5) the interior of any air recirculation path up to and including recirculation particulate filters; (6) any solvent concentrator (pollution abatement) unit or solvent recovery (distillation) unit; and (7) the inside of a membrane enclosure. The following are not part of the spray area: (1) fresh air make-up units; (2) air supply ducts and air supply plenums; (3) recirculation air supply ducts downstream of recirculation particulate filters; and (4) exhaust ducts from solvent concentrator (pollution abatement) units. [**33:** 3.3.2.3] (516) (CMP-14)

Informational Note: Unenclosed spray areas are locations outside of buildings or are localized operations within a larger room or space. Such areas are normally provided with some local vapor extraction/ventilation system. In automated operations, the area limits are the maximum area in the direct path of spray operations. In manual operations, the area limits are the maximum area of spray when aimed at 90 degrees to the application surface.

Spray Booth.

A power-ventilated enclosure for a spray application operation or process that confines and limits the escape of the material being sprayed, including vapors, mists, dusts, and residues that are produced by the spraying operation and conducts or directs these materials to an exhaust system. [**33:** 3.3.19] (516) (CMP-14)

Informational Note: A spray booth is an enclosure or insert within a larger room used for spraying, coating, and/or dipping applications. A spray booth can be fully enclosed or have open front or face and can include a separate conveyor entrance and exit. The spray booth is provided with a dedicated ventilation exhaust with supply air from the larger room or from a dedicated air supply.

Spray Room.

A power-ventilated fully enclosed room used exclusively for open spraying of flammable or combustible materials. [**33:** 3.3.16] (516) (CMP-14)

Stage Effect (Special Effect).

An electrical or electromechanical piece of equipment used to simulate a distinctive visual or audible effect, such as a wind machine, lightning simulator, or sunset projector. (CMP-15)

Stage Equipment.

Equipment at any location on the premises integral to the stage production including, but not limited to, equipment for lighting, audio, special effects, rigging, motion control, projection, or video. (520) (CMP-15)

Stage Lighting Hoist.

A motorized lifting device that contains a mounting position for one or more luminaires, with wiring devices for connection of luminaires to branch circuits, and integral flexible cables to allow the luminaires to travel over the lifting range of the hoist while energized. (520) (CMP-15)

Stage Property.

An article or object used as a visual element in a motion picture or television production, except painted backgrounds (scenery) and costumes. (530) (CMP-15)

Stage Set.

A specific area set up with temporary scenery and properties designed and arranged for a particular scene in a motion picture or television production. (CMP-15)

Stage Switchboard.

A permanently installed switchboard, panelboard, or rack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone, used primarily to feed stage equipment. (CMP-15)

Stage Switchboard, Portable.

A portable rack or pack containing dimmers or relays with associated overcurrent protective devices, or overcurrent protective devices alone used to feed stage equipment. (520) (CMP-15)

Stand Lamp (Work Light).

A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination on the stage or in the auditorium. (CMP-15)

Stand Lamp (Work Light).

A portable stand that contains a general-purpose luminaire or lampholder with guard for the purpose of providing general illumination in the studio or stage. (530) (CMP-15)

Stand-Alone System.

A system that is not connected to an electric power production and distribution network. (CMP-4)

Stationary (as applied to equipment).

Equipment that is not moved from one place to another in normal use. (680) (CMP-17)

Storable Swimming, Wading, or Immersion Pools and Storable/Portable Spas and Hot Tubs.

Swimming, wading, or immersion pools and spas and hot tubs installed fully on or above the ground that are intended to be stored when not in use designed for ease of relocation. (680) (CMP-17)

> Informational Note: Historically, a 1.07 m (42 in.) wall height accommodated most storable swimming pools. Modern manufacturing methods have allowed storable pool manufacturers to increase wall heights while still permitting ease of assembly and disassembly of the pool.

Storage, Dry Stack.

A facility, either covered or uncovered, constructed of horizontal and vertical structural members designed to allow placement of small boats in defined slots arranged both horizontally and vertically. [**303:** 3.3.23.2] (555) (CMP-7)

Stored-Energy Power Supply System (SEPSS).

This definition shall apply within this article and throughout the code. A complete functioning EPSS powered by a stored-energy electrical source. (CMP-13)

Strip Light.

A luminaire with multiple lamps arranged in a row. (520) (CMP-15)

Structure.

That which is built or constructed, other than equipment. (CMP-1)

Structure, Relocatable. (Relocatable Structure)

A factory-assembled structure or structures transportable in one or more sections that are built on a permanent chassis and designed to be used as other than a dwelling unit without a permanent foundation. (545) (CMP-7)

> Informational Note: Examples of relocatable structures are those units that are equipped for sleeping purposes only, contractor's and other on-site offices, construction job dormitories, studio dressing rooms, banks, clinics, stores, shower facilities and restrooms, training centers, or for the display or demonstration of merchandise or machines.

Subassembly.

Component parts or a segment of a sign, retrofit kit, or outline lighting system that, when assembled, forms a complete unit or product. (600) (CMP-18)

Substation.

An assemblage of equipment (e.g., switches, interrupting devices, circuit breakers, buses, and transformers) through which electric energy is passed for the purpose of distribution, switching, or modifying its characteristics. (CMP-9)

Supervised Industrial Installation.

For the purposes of Part VIII of Article 240, the industrial portions of a facility where all of the following conditions are met:

(1) Conditions of maintenance and engineering supervision ensure that only qualified persons monitor and service the system.

(2) The premises wiring system has 2500 kVA or greater of load used in industrial process(es), manufacturing activities, or both, as calculated in accordance with Article 220.

(3) The premises has at least one service or feeder that is more than 150 volts to ground and more than 300 volts phase-to-phase.

This definition excludes installations in buildings used by the industrial facility for offices, warehouses, garages, machine shops, and recreational facilities that are not an integral part of the industrial plant, substation, or control center. (240) (CMP-10)

Supervisory Control and Data Acquisition (SCADA).

An electronic system that provides monitoring and controls for the operation of the critical operations power system. This can include the fire alarm system, security system, control of the HVAC, the start/stop/monitoring of the power supplies and electrical distribution system, annunciation and communications equipment to emergency personnel, facility occupants, and remote operators. (CMP-13)

Surge Arrester.

A protective device for limiting surge voltages by discharging or bypassing surge current; it also prevents continued flow of follow current while remaining capable of repeating these functions. (CMP-10)

Surge-Protective Device (SPD).

A protective device for limiting transient voltages by diverting or limiting surge current; it also prevents continued flow of follow current while remaining capable of repeating these functions and is designated as follows:

(1) Type 1: Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service disconnect overcurrent device

(2) Type 2: Permanently connected SPDs intended for installation on the load side of the service disconnect overcurrent device, including SPDs located at the branch panel

(3) Type 3: Point of utilization SPDs

(4) Type 4: Component SPDs, including discrete components, as well as assemblies. (CMP-10)

Informational Note: See UL 1449, *Standard for Surge Protective Devices* , for further information on SPDs.

Suspended Ceiling Grid.

A system that serves as a support for a finished ceiling surface and other utilization equipment. (393) (CMP-18)

Switch, Bypass Isolation.

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

Switch, General-Use. (General-Use Switch)

A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage. (CMP-9)

Switch, General-Use Snap. (General-Use Snap Switch)

A form of general-use switch constructed so that it can be installed in device boxes or on box covers, or otherwise used in conjunction with wiring systems recognized by this *Code* . (CMP-9)

Switch, Isolating. (Isolating Switch)

A switch intended for isolating an electrical circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means. (CMP-9)

Switch, Meter-Mounted Transfer. (Meter-Mounted Transfer Switch)

A transfer switch connected between the utility meter and the meter base or fabricated as part of the meter base. (CMP-13)

Informational Note: Meter-mounted transfer switches can plug into the meter base or be fabricated as part of the meter base. Transfer switches that incorporate the meter base in the transfer equipment assembly are not considered meter-mounted transfer switches.

Switch, Motor-Circuit.

A switch rated in horsepower that is capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage. (CMP-11)

Switch, Transfer.

An automatic or nonautomatic device for transferring one or more load conductor connections from one power source to another. (CMP-13)

Switchboard.

A large single panel, frame, or assembly of panels on which are mounted on the face, back, or both, switches, overcurrent and other protective devices, buses, and usually instruments. These assemblies are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (CMP-9)

Switchgear.

An assembly completely enclosed on all sides and top with sheet metal (except for ventilating openings and inspection windows) and containing primary power circuit switching, interrupting devices, or both, with buses and connections. The assembly may include control and auxiliary devices. Access to the interior of the enclosure is provided by doors, removable covers, or both. (CMP-9)

Informational Note: All switchgear subject to *NEC* requirements is metal enclosed. Switchgear rated below 1000 V or less may be identified as “low-voltage power circuit breaker switchgear.” Switchgear rated over 1000 V may be identified as “metal-enclosed switchgear” or “metal-clad switchgear.” Switchgear is available in non–arc-resistant or arc-resistant constructions.

Switching Device.

A device designed to close, open, or both, one or more electrical circuits. (CMP-1)

Cutout.

An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link) or may act as the disconnecting blade by the inclusion of a nonfusible member.

Disconnecting (or Isolating) Switch (Disconnector, Isolator).

A mechanical switching device used for isolating a circuit or equipment from a source of power.

Interrupter Switch.

A switch capable of making, carrying, and interrupting specified currents.

Oil Cutout (Oil-Filled Cutout).

A cutout in which all or part of the fuse support and its fuse link or disconnecting blade is mounted in oil with complete immersion of the contacts and the fusible portion of the conducting element (fuse link) so that arc interruption by severing of the fuse link or by opening of the contacts will occur under oil.

Oil Switch.

A switch having contacts that operate under oil (or askarel or other suitable liquid).

Regulator Bypass Switch.

A specific device or combination of devices designed to bypass a regulator.

System Isolation Equipment (as applied to motors).

A redundantly monitored, remotely operated contactor-isolating system, packaged to provide the disconnection/isolation function, capable of verifiable operation from multiple remote locations by means of lockout switches, each having the capability of being padlocked in the “off” (open) position. (430) (CMP-11)

Tap Conductor.

A conductor, other than a service conductor, that has overcurrent protection ahead of its point of supply that exceeds the value permitted for similar conductors that are protected as described elsewhere in 240.4. (240) (CMP-10)

Task Illumination.

Provisions for the minimum lighting required to carry out necessary tasks in the areas described in 517.34(A), including safe access to supplies and equipment and access to exits. [**99:** 3.3.177] (517) (CMP-15)

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. (640) (CMP-12)

Television Studio or Motion Picture Stage (Sound Stage).

A building or portion of a building usually insulated from the outside noise and natural light for use by the entertainment industry for the purpose of motion picture, television, or commercial production. (530) (CMP-15)

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. (640) (CMP-12)

Terminal (as applied to batteries).

That part of a cell, container, or battery to which an external connection is made (commonly identified as post, pillar, pole, or terminal post). (CMP-13)

Thermal Protector (as applied to motors).

A protective device for assembly as an integral part of a motor or motor-compressor that, when properly applied, protects the motor against dangerous overheating due to overload and failure to start. (CMP-11)

> Informational Note: The thermal protector may consist of one or more sensing elements integral with the motor or motor-compressor and an external control device.

Thermal Resistivity.

The heat transfer capability through a substance by conduction. (CMP-6)

> Informational Note: Thermal resistivity is the reciprocal of thermal conductivity and is designated Rho, which is expressed in the units °C-cm/W.

Thermally Protected (as applied to motors).

A motor or motor-compressor that is provided with a thermal protector. (CMP-11)

Top Shield, Type FCC.

A grounded metal shield covering under-carpet components of the FCC system for the purposes of providing protection against physical damage. (324) (CMP-6)

Tower (as applied to wind electric systems).

A pole or other structure that supports a wind turbine. (694) (CMP-4)

Trailer, Camping. (Camping Trailer)

A vehicular portable unit mounted on wheels and constructed with collapsible partial side walls that fold for towing by another vehicle and unfold at the campsite to provide temporary living quarters for recreational, camping, or travel use. *(See Recreational Vehicle.)* (551) (CMP-7)

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

A device connected on the load side of a branch-circuit overcurrent protective device that transfers only emergency lighting loads from the normal power source to an emergency power source. (700) (CMP-13)

> Informational Note: See ANSI/UL 1008, Transfer Switch Equipment, for information covering branch-circuit emergency lighting transfer switches.

Transformer.

An individual transformer, single- or polyphase, identified by a single nameplate, unless otherwise indicated in this article. (CMP-9)

Transition Assembly, Type FCC.

An assembly to facilitate connection of the FCC system to other wiring systems, incorporating (1) a means of electrical interconnection and (2) a suitable box or covering for providing electrical safety and protection against physical damage. (324) (CMP-6)

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. (626) (CMP-12)

Transportable (as applied to nonmedical X-ray equipment).

X-ray equipment that is to be installed in a vehicle or that may be readily disassembled for transport in a vehicle. (660) (CMP-12)

Travel Trailer.

A vehicular unit, mounted on wheels, designed to provide temporary living quarters for recreational, camping, or travel use, of such size or weight as not to require special highway movement permits when towed by a motorized vehicle, and of gross trailer area less than 30 m^2 (320 ft^2). *(See Recreational Vehicle.)* (551) (CMP-7)

Truck.

A motor vehicle designed for the transportation of goods, services, and equipment. (626) (CMP-12)

Truck Camper.

A portable unit constructed to provide temporary living quarters for recreational, travel, or camping use, consisting of a roof, floor, and sides, designed to be loaded onto and unloaded from the bed of a pickup truck. *(See Recreational Vehicle.)* (551) (CMP-7)

Truck Coupler.

A truck flanged surface inlet and mating cord connector. (626) (CMP-12)

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. (626) (CMP-12)

Trunk Cable.

A portable extension cable containing six or more branch circuits, a male multipole plug, and a female multipole receptacle. (520) (CMP-15)

Tubing, Electrical Metallic (EMT). (Electrical Metallic Tubing)

An unthreaded thinwall raceway of circular cross section designed for the physical protection and routing of conductors and cables and for use as an equipment grounding conductor when installed utilizing appropriate fittings. (CMP-8)

Tubing, Electrical Nonmetallic (ENT). (Electrical Nonmetallic Tubing)

A nonmetallic, pliable, corrugated raceway of circular cross section with integral or associated couplings, connectors, and fittings for the installation of electrical conductors. ENT is composed of a material that is resistant to moisture and chemical atmospheres and is flame retardant.

A pliable raceway is a raceway that can be bent by hand with a reasonable force but without other assistance. (CMP-8)

Tubing, Flexible Metallic (FMT). (Flexible Metallic Tubing)

A metal raceway that is circular in cross section, flexible, and liquidtight without a nonmetallic jacket. (CMP-8)

Two-Fer.

An assembly containing one male plug and two female cord connectors used to connect two loads to one branch circuit. (520) (CMP-15)

Type of Protection “n”.

Type of protection where electrical equipment, in normal operation, is not capable of igniting a surrounding explosive gas atmosphere and a fault capable of causing ignition is not likely to occur. (505) (CMP-14)

Informational Note: See ANSI/UL 60079-15-2013, *Explosive Atmospheres — Part 15: Equipment Protection by Type of Protection “n”.*

Unclassified Locations.

Locations determined to be neither Class I, Division 1; Class I, Division 2; Zone 0; Zone 1; Zone 2; Class II, Division 1; Class II, Division 2; Class III, Division 1; Class III, Division 2; Zone 20; Zone 21; Zone 22; nor any combination thereof. (CMP-14)

Underground Feeder and Branch-Circuit Cable, Type UF.

A factory assembly of one or more insulated conductors with an integral or an overall covering of nonmetallic material suitable for direct burial in the earth. (CMP-6)

Unenclosed Spray Area.

Any spray area that is not confined by a limited finishing workstation, spray booth, or spray room, as herein defined. [**33:** 3.3.2.3.2] (516) (CMP-14)

Ungrounded.

Not connected to ground or to a conductive body that extends the ground connection. (CMP-5)

Uninterruptible Power Supply (UPS).

A device or system that provides quality and continuity of ac power through the use of a stored-energy device as the backup power source for a period of time when the normal power supply is incapable of performing acceptably. (CMP-13)

Unit Equipment.

A battery-equipped emergency luminaire that illuminates only as part of the emergency illumination system and is not illuminated when the normal supply is available. (CMP-13)

Utilization Equipment.

Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes. (CMP-1)

Valve Actuator Motor (VAM) Assemblies.

A manufactured assembly, used to operate a valve, consisting of an actuator motor and other components such as motor controllers, torque switches, limit switches, and overload protection. (430) (CMP-11)

Informational Note: VAMs typically have short-time duty and high-torque characteristics.

Ventilated.

Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors. (CMP-14)

Vessel.

A container such as a barrel, drum, or tank for holding fluids or other material. (CMP-17)

Volatile Flammable Liquid.

A flammable liquid having a flash point below 38°C (100°F), or a flammable liquid whose temperature is above its flash point, or a Class II combustible liquid that has a vapor pressure not exceeding 276 kPa (40 psia) at 38°C (100°F) and whose temperature is above its flash point. (CMP-14)

Voltage (of a circuit).

The greatest root-mean-square (rms) (effective) difference of potential between any two conductors of the circuit concerned. (CMP-1)

Informational Note: Some systems, such as 3-phase 4-wire, single-phase 3-wire, and 3-wire direct current, may have various circuits of various voltages.

Voltage, Nominal.

A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (e.g., 120/240 volts, 480Y/277 volts, 600 volts). (CMP-1)

Informational Note No. 1: The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

Informational Note No. 2: See ANSI C84.1-2011, *Voltage Ratings for Electric Power Systems and Equipment (60 Hz)*.

Voltage, Nominal. (Nominal Voltage)

A value assigned to a circuit or system for the purpose of conveniently designating its dc voltage class. (712) (CMP-13)

Informational Note: The actual voltage at which a circuit operates can vary from the nominal voltage within a range that permits satisfactory operation of equipment.

Voltage to Ground.

For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit. (CMP-1)

Watertight.

Constructed so that moisture will not enter the enclosure under specified test conditions. (CMP-1)

Weatherproof.

Constructed or protected so that exposure to the weather will not interfere with successful operation. (CMP-1)

Informational Note: Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

Wet Procedure Location.

The area in a patient care space where a procedure is performed that is normally subject to wet conditions while patients are present, including standing fluids on the floor or drenching of the work area, either of which condition is intimate to the patient or staff. [**99:** 3.3.187] (517) (CMP-15)

Informational Note: Routine housekeeping procedures and incidental spillage of liquids do not define a wet procedure location. [**99:** A.3.3.187]

Wharf.

A structure at the shoreline that has a platform built along and parallel to a body of water with either an open deck or a superstructure. [**307:** 3.3.24] (555) (CMP-7)

Wind Turbine.

A mechanical device that converts wind energy to electrical energy. (CMP-4)

Wind Turbine Output Circuit.

The circuit conductors between the internal components of a wind turbine (which might include an alternator, integrated rectifier, controller, and/or inverter) and other equipment. (694) (CMP-4)

Wire.

A factory assembly of one or more insulated conductors without an overall covering. (805) (CMP-16)

Wireless Power Transfer (WPT).

The transfer of electrical energy from a power source to an electrical load via magnetic fields by a contactless means between a primary device and a secondary device. (625) (CMP-12)

Wireless Power Transfer Equipment (WPTE).

Equipment comprising the conductors, including the ungrounded, grounded, and equipment grounding conductors, personnel protection system, power and control electronics, communication electronics, the output cable to the primary pad, the primary pad 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 without physical electrical contact. (625) (CMP-12)

Informational Note No. 1: The general form of WPTE consists of two physical packages: a control box and a primary pad.

Informational Note No. 2: Electric vehicle power export equipment and wireless power transfer equipment are sometimes contained in one set of equipment, sometimes referred to as a bidirectional WPTE.

Wireways, Metal. (Metal Wireways)

Sheet metal troughs with hinged or removable covers for housing and protecting electrical wires and cable and in which conductors are laid in place after the raceway has been installed as a complete system. (CMP-8)

Wireways, Nonmetallic. (Nonmetallic Wireways)

Flame-retardant, nonmetallic troughs with removable covers for housing and protecting electrical wires and cables in which conductors are laid in place after the raceway has been installed as a complete system. (CMP-8)

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. (645) (CMP-12)

Statement of Problem and Substantiation for Public Comment

The current reorganization of placing all definitions into article 100 will have a serious negative effect on usability of the NEC. This will have the most impact on specialty definitions that only apply to a single article becoming "lost" to the reader when located with all other definitions in article 100. I suggest that some improvement could be achieved by the creation of an informative annex (I used Annex K in my proposed informational note 2) listing such single-article definitions, sorted by article. In addition, the creation of hyperlinks in the electronic edition of the NEC where such defined terms appear in specific articles could provide an instant link to the definition in article 100. Both these solutions were discussed by various Code Panels during the First Revision meetings. Either or both of these changes would go a long way to restoring some of the usability lost by the move of definitions to article 100.

Related Item

• FR8213

Submitter Information Verification

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Committee: NEC-P01

Public Comment No. 438-NFPA 70-2021 [Global Input]

This public comment is submitted on behalf of one of the Definitions Task Groups (Definitions TG-3) appointed by the Correlating Committee. This task group consisted Mike Stone (CMP-1), Dean Hunter (CMP-7), John Kovacik (CMP-12), Don Ankele (CMP-14), Chad Beebe (CMP-15), Mike Querry (CMP-17) chair. The task group was assigned the following charge. "The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual." Definitions TG-3 was requested by the corelating committee to review the following definitions:

Alternating-Current Power Distribution Box (530) (CMP-15)

Appliance (CMP-17)

Appliance, Fixed (CMP-7)

Appliance, Portable (CMP-7)

Equipment. (CMP-1)

Equipment, Portable (640) (CMP-12)

Equipment, Signal (620) (CMP-12)

Fastened-In-Place (CMP-12)

Fixed. (680) (CMP-17)

Fixed-In-Place (CMP-12)

Mobile Equipment (CMP-14)

Portable (625) (CMP-12); (680) (CMP-17); (660) (CMP-12)

Portable Equipment. (CMP-14-15-17)

Portable Power Distribution Unit. (CMP-15)

Portable Structures (CMP-15)

Temporary Equipment (CMP-12)

Utilization Equipment (CMP-1)

The definitions TG-3 makes the following recommendations:

Alternating-Current Power Distribution Box (530) (CMP-15)

The definition for Alternating-Current Power Distribution Box can be deleted

Substantiation - the definition for Portable Power Distribution Unit will work for both.

Appliance.

Utilization equipment that is fastened in place, stationary or portable, typically generally other than industrial, that is normally built in standardized sizes or types and is installed or connected as a unit to perform one or more functions such as clothes washing, air-conditioning, food mixing, deep frying, and so forth. (CMP-17)

Appliance, Fixed (CMP-7)

Delete the definition (appliance, fixed)

Substantiation - appliance is defined and the definition for fixed will be further defined.

Appliance, Portable (CMP-7)

Delete the definition (appliance, portable)

Substantiation - appliance is defined and the defintion for portable will be further defined.

Equipment.

A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, an electrical installation. (CMP-1)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC.

Equipment, Portable (640) (CMP-12)

Delete this definition as a new definition for Portable Equipment is being proposed.

~~Signal~~Equipment, Signal. (Signal Equipment)

Includes audible and visual equipment such as chimes, gongs, lights, and displays that convey information to the user. (620) (CMP-12)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC with the minor edits proposed to comply with the style manual.

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~~.(625) (CMP-12)

Substantiation - The proposed 2023 definition would be revised to correlate with the proposed definitions for portable and mobile.

Fixed. (680) (CMP-17).

Equipment, Fixed (as applied to equipment) (Fixed Equipment).

Delete the 2023 proposed definition utilize the Fixed-in-Place definition.

Equipment, Fixed-In-Place (Fixed Equipment)

Equipment in a specific location where the mounting or fastening means requires a tool for removal.

Substantiation - The proposed TG-3 defintion would replace the propose 2023 definition

Equipment, Mobile (Mobile Equipment).

Equipment with electrical components that is suitable to be moved only with mechanical aids or is provided with wheels for movement by a person(s) or powered devices. (513) (CMP-14)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Portable (660) (CMP-12)

Equipment, Portable (as applied to nonmedical Xray equipment) (Portable Equipment). (660) (CMP-12)

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Portable

A device that is designed to be hand-carried from location to location, or easily transported without the use of other devices or equipment.

Substantiation - The proposed TG-3 defintion for "Portable" would replace the proposed 2023 definitions for Portable (660) (CMP-12)and Portable (as applied to nonmedical Xray equipment)

Equipment, Portable (As applied to Hazrdous Locations) (Portable Equipment).

Equipment with electrical components suitable to be moved by a single person without mechanical aids. (511) (CMP-14)

Substantiation - The proposed TG-3 definition for**"**Portable Equipment (As applied to Hazrdous Locations)" would replace the proposed 2023 definition to correlate with the proposed TG-3 definition for "Portable Equipment"

Portable Equipment.(520) (CMP-15)

Delete

Portable Equipment.(530) (CMP-15)

Delete

Portable (as applied to equipment). (680) (CMP-17)

Delete

Equipment, Portable (Portable Equipment).

Equipment intended to be moved from one location to another.

Substantiation - The proposed TG-3 definition for**"**Portable Equipment" would combine the definitions for "Portable equipment" for Articles 520, 530 and 680 into one common definition.

Portable Power Distribution Unit.

A power distribution box containing receptacles and overcurrent devices. (520) (CMP-15)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Portable Structures.

Units designed to be moved including, but not limited to, amusement rides, attractions, concessions, tents, trailers, trucks, and similar units. (525) (CMP-15)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Equipment, Temporary Equipment (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. (640) (CMP-12)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Equipment, Utilization (Utilization Equipment).

Equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes. (CMP-1)

Substantiation - This definition should be kept as currently proposed for the 2023 NEC

Statement of Problem and Substantiation for Public Comment

This public comment is submitted on behalf of one of the Definitions Task Groups (Definitions TG-3) appointed by the Correlating Committee. This task group consisted Mike Stone (CMP-1), Dean Hunter (CMP-7), John Kovacik (CMP-12), Don Ankele (CMP-14), Chad Beebe (CMP-15), Mike Querry (CMP-17) chair. The task group was assigned the following charge. "The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual." Definitions TG-3 was requested by the corelating committee to review the following definitions:

Alternating-Current Power Distribution Box (530) (CMP-15)
Appliance (CMP-17)
Appliance, Fixed (CMP-7)
Appliance, Portable (CMP-7)
Equipment. (CMP-1)
Equipment, Portable (640) (CMP-12)
Equipment, Signal (620) (CMP-12)
Fastened-In-Place (CMP-12)
Fixed. (680) (CMP-17)
Fixed-In-Place (CMP-12)
Mobile Equipment (CMP-14)
Portable (625) (CMP-12); (680) (CMP-17); (660) (CMP-12)
Portable Equipment. (CMP-14-15-17)
Portable Power Distribution Unit. (CMP-15)
Portable Structures (CMP-15)
Temporary Equipment (CMP-12)
Utilization Equipment (CMP-1)

Related Item

• FR 9274 (Global Input)

Submitter Information Verification

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Committee: NEC-P17

By checking this box I affirm that I am Dennis Querry, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature

Public Comment No. 462-NFPA 70-2021 [Global Input]

Corrosive Environment (As applied to Swimming Pools, Fountains, and Similar Installations). Areas or enclosures without ~~adequate~~ ventilation, where electrical equipment is located and pool sanitation chemicals are stored, handled, or dispensed. (680) (CMP-17).

Informational Note No 1.: See Advisory: Swimming Pool Chemical: Chlorine, OSWER 90- 008.1, June 1990, available from the EPA National Service Center for Environmental Publications (NSCEP) as sanitation chemicals and pool water are considered to pose a risk of corrosion (gradual damage or destruction of materials) due to the presence of oxidizers (e.g., calcium

hypochlorite, sodium hypochlorite, bromine, chlorinated isocyanurates) and chlorinating agents that release chlorine when dissolved in water.

Informational Note No. 2: See ANSI/APSP-11, Standard for Water Quality in Public Pools and Spas, ANSI/ASHRAE 62.1, Table 6-4 Minimum Exhaust Rates, and Section 324 of the 2021 International Swimming Pool and Spa Code (ISPSC), including associated definitions and requirements concerning adequate ventilation of indoor spaces such as equipment and chemical

storage rooms, which can reduce the likelihood of the accumulation of corrosive vapors. Chemicals such as chlorine cause severe corrosive and deteriorating effects on electrical connections, equipment, and enclosures when stored and kept in the same vicinity. (680) (CMP-17)

Luminaire, Cord-and-Plug-Connected. (Cord-and-Plug-Connected Luminaire). A

lighting assembly ~~consisting of a luminaire~~ intended for installation in the wall of a spa, hot tub, or storable pool, including a cord-and-plug-connected transformer. (680) (CMP-17)

Luminaire, Through-Wall (Through-Wall Luminaire). A lighting assembly intended for installation above grade, on or through the wall of a pool, consisting of twointerconnectedgroups of components separated by the pool wall. (680) (CMP- 17)

Resistance Heating Element. A specific separate element to generate heat that is externally attached to, embedded in, integrated with, or internal to the object to be heated.

Pool, Storable; used for Swimming, Wading or Immersion, Storable (Storable Swimming Wading or Immersion Pool). Swimming, wading or immersion pools installed entirely on or above the ground that are intended to be stored when not is use and are designed for ease of relocation. (680) (CMP-17)

Informational Note: Historically, a 1.07 m (42 in.) wall height accommodated most storable

swimming pools. Modern manufacturing methods have allowed storable pool manufacturers to increase wall heights while still permitting ease of assembly and disassembly of the pool.

Spa and Hot Tub, Storable. Spas and hot tubs installed entirely on or above the ground that are intended to be stored when not is use and are designed for ease of relocation. (680) (CMP-17)

Bodies of Water, Artificially Made (Artificially Made Bodies of Water). Bodies of water that have been constructed or modified to fit some decorative or commercial purpose such as, but not limited to, aeration ponds, fish farm ponds, storm retention basins, treatment ponds, and irrigation (channel) facilities. Water depths may vary seasonally or be controlled. (682) (CMP-17)

Bodies of Water, Natural (Natural Bodies of Water). Bodies of water such as lakes, streams, ponds, rivers, and other naturally occurring bodies of water, which may vary in depth throughout the year. (682) (CMP-17)

Electrically Powered Pool Lift. A fabricated unit that provides accessibility to and from a pool or spa for people with disabilities. (680) (CMP-17)

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Statement of Problem and Substantiation for Public Comment

CMP 17 Definitions Task Group proposes the modifications to comply with FR9274

Corrosive Environment — Swimming Pools, Fountains, and Similar Installations
The Correlating Committee directs that the definition of the term “corrosive environment” include parenthetical text (as applied to swimming pools, fountains, and similar installations). The use of “adequate ventilation” is vague and unenforceable requirement in a definition.
The Correlating Committee directs CMP 17 to provide clarity on what is meant by “adequate ventilation” as used in the definition.
2.2.2.3 Base Term
2.2.2.3.2 Article Number
EPA Chemical Emergency Preparedness and Prevention Advisory SWIMMING POOL CHEMICALS: Chlorine

CMP 17 Substantiation - The definition of Corrosive Environment is revised to comply with the NEC Style Manual. The definition has the parenthetical text added, and the term “adequate” as applied to ventilation has been removed as this is considered a vague and unenforceable term.

Lighting Assembly, Cord-and-Plug-Connected. (Cord-and-Plug-Connected Lighting Assembly

The Correlating Committee directs the panel to consider the term luminaire instead of lighting assembly for correlation of the document

CMP 17 Substantiation - The definition for “Lighting Assembly, Cord-and-Plug-Connected” was revised to provide additional clarity, and to utilize the term “luminaire” instead of “lighting assembly”. This is also consistent with the UL Marking Guide for Swimming Pool Equipment, Spas, Fountains and Hydromassage Bathtubs which utilizes the term “luminaire”.

Lighting Assembly, Through-Wall (Through-Wall Lighting Assembly).

The Correlating Committee directs the panel to consider the term luminaire instead of lighting assembly for correlation of the document.

CMP 17 Substantiation - The definition for “Lighting Assembly, Cord-and-Plug-Connected” was revised to provide additional clarity by utilizing the term “luminaire” instead of “lighting assembly”. This is also consistent with the UL Marking Guide for Swimming Pool Equipment, Spas, Fountains and Hydromassage Bathtubs which utilizes the term “luminaire”.

Resistance Heating Element.

The Correlating Committee directs the panel review and reconsider the wording of this definition relative to use of the word “may” as provided in Sections 3.1.1 and 3.2.1 of the NEC Style Manual.

CMP 17 Substantiation - The definition of Resistance Heating Element is revised to comply with the NEC Style Manual. The term “may” has been removed as this is considered a vague and unenforceable term.

Storable Swimming, Wading, or Immersion Pools; and Storable/Portable Spas and Hot Tubs.

Defined alternate terms shall be shown in accordance with 2.2.2.5 of the Style Manual. The Correlating Committee notes that "storable swimming, wading, or immersion pools" is not used in the document other than the title of Part III. This term might also be better grouped with pools as the base term so it is easy to locate the definition, in accordance with 2.2.2.3.

The Correlating Committee directs that CMP17 to review the use of the word “fully” in the context of the definition for clarity and usability. Ballot comments identified that the revised definition is missing two words. Add "and are" before "designed for ease of relocation." in the definition. The Correlating Committee directs that CMP-17 the wording in FR – 8413 be reviewed for and revised as determined necessary for clarity and ease of applying the requirement.

2.2.2.3 Base Term.
Group by Pool Pool, Storable. (Storable Pool)
2.2.2.5 Alternate Term

CMP 17 substantiation - For clarity the original definition was split into two definitions: one specific to storable pools and the other specific to storable spas and hot tubs.

The word “fully” has been replaced by “entirely” for clarification. “Entirely on” vs “entirely above” is a necessary distinction because storable spas and pools are often placed on elevated decks which may be multiple stories above the ground, and therefore are not “entirely on” the ground. Further, some pools and spas are partially buried in the ground and therefore are not considered storable under those conditions.

Also, added “and are” before “designed for ease of relocation” which improves clarity.

Artificially Made Bodies of Water.

2.2.2.3 Base Term
(Group by Bodies of Water)

CMP 17 substantiation - The definition is revised to comply with 2.2.2.3 of the NEC Style Manual, by using the base term “Bodies of Water” at start of the defined term, and adding parenthetical text with alternate terms.

Natural Bodies of Water.

2.2.2.3 Base Term
(Group by Bodies of Water)

CMP 17 substantiation - The definition is revised to comply with 2.2.2.3 of the NEC Style Manual, by using the base term “Bodies of Water” at start of the defined term, and adding parenthetical text with alternate terms.

Electrically Powered Pool Lift

2.2.2.2. Term in Definition

CMP 17 substantiation - The definition is revised to comply with 2.2.2.2 of the NEC Style Manual, by removing the word “lift” in the definition, as “lift” is part of the term being defined.

Related Item

- 9274

Submitter Information Verification

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Committee: NEC-P17

Public Comment No. 732-NFPA 70-2021 [Global Input]

The Correlating Committee notes there are more than one related term or similar terms for the various Cable Definitions. Section 2.2.2.4 of the NEC Style Manual states a task group shall be formed to work on the development of a single acceptable definition. There are also correlation issues with other terms regarding cable wiring methods and installations. The Correlating Committee establishes a Task Group with representation from CMPs 1, 3, 12, 15 and 16 to review the following terms to group them by a base term and to consider a single definition where applicable. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

Abandoned Cable. (CMP-3) 9620.

Abandoned Class2, Class 3, and PLTC Cable (CMP-3) 9620.

Bundled Cable. (CMP-15)

Cable, Abandoned (CMP-16) 9570.

Cable, Bundle. (CMP-3) 9620.

Cable, Circuit Integrity. (CMP-3) 9555.

Cable, Communications, Circuit Integrity. (CMP-16)

Cable Routing Assembly. (CMP-16)

Cable Sheath. (CMP-16) 9571.

Cable Sheath, Optical Fiber. (CMP-16) 9574.

Cables for Limited Use. (CMP-3) 9620.

Fire Alarm, Circuit Integrity (CI) Cable. (CMP-3) 9620.

Grouped. (CMP-15)

Point of Entrance. (CMP-16) 9572.

Point of Entrance (Point of Entrance Optical Fiber Cable). (CMP-16) 9572.

Additional Proposed Changes

File Name	Description	Approved
3_CN_392_Global.pdf	3 CN392	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 392 appeared in the First Draft Report on First Revision Nos. 9620, 9570, 9555, 9571, 9574 and 9572.

The Correlating Committee notes there are more than one related term or similar terms for the various Cable Definitions. Section 2.2.2.4 of the NEC Style Manual states a task group shall be formed to work on the development of a single acceptable definition. There are also correlation issues with other terms regarding cable wiring methods and installations. The Correlating Committee establishes a Task Group with representation from CMPs 1, 3, 12, 15 and 16 to review the following terms to group them by a base term and to consider a single definition where applicable. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

Abandoned Cable. (CMP-3) 9620.

Abandoned Class2, Class 3, and PLTC Cable (CMP-3) 9620.

Bundled Cable. (CMP-15)

Cable, Abandoned (CMP-16) 9570.

Cable, Bundle. (CMP-3) 9620.

Cable, Circuit Integrity. (CMP-3) 9555.

Cable, Communications, Circuit Integrity. (CMP-16)

Cable Routing Assembly. (CMP-16)

Cable Sheath. (CMP-16) 9571.

Cable Sheath, Optical Fiber. (CMP-16) 9574.

Cables for Limited Use. (CMP-3) 9620.

Fire Alarm, Circuit Integrity (CI) Cable. (CMP-3) 9620.

Grouped. (CMP-15)

Point of Entrance. (CMP-16) 9572.

Point of Entrance (Point of Entrance Optical Fiber Cable). (CMP-16) 9572.

Related Item

• First Revision No. 9620	• First Revision No. 9570	• First Revision No. 9555	• First Revision No. 9571	• First Revision No. 9574	• First Revision No. 9572

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Public Comment No. 821-NFPA 70-2021 [Global Input]

The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

The Correlating Committee directs that FR 9274 be referred to CMP 3 for information regarding the definition for "Temporary Equipment".

Appliance, Fixed (CMP-7) 7690.

Appliance (CMP-17).

Appliance, Portable (CMP-7) 7690.

Equipment. (CMP-1).

Equipment, Portable (CMP-12)

Portable (CMP-12-17). 9396

Portable Equipment. (CMP-14-15-17). 8213

Mobile Equipment (CMP-14) 8748

Portable Power Distribution Unit. (CMP-15) 8640

Portable Structures (CMP-15)

Utilization Equipment (CMP-1)

Fastened-In-Place (CMP-12) 9473.

Fixed-In-Place (CMP-12) 9393.

Temporary Equipment (CMP-12) 9274

Additional Proposed Changes

File Name	Description	Approved
7_CN_393_Global.pdf	7 CN393	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 393 appeared in the First Draft Report on First Revision Nos. 7690, 9396, 8213, 8748, 8640, 9473 and 9393.

The Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 3, 7, 12, 14, 15 and 17 to review the following definitions for possible revisions and combining definitions. The Task Group will also make necessary changes to comply with the NEC Style Manual for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

The Correlating Committee directs that FR 9274 be referred to CMP 3 for information regarding the definition for "Temporary Equipment".

Appliance, Fixed (CMP-7) 7690.

Appliance (CMP-17).

Appliance, Portable (CMP-7) 7690.

Equipment. (CMP-1).

Equipment, Portable (CMP-12)

Portable (CMP-12-17). 9396

Portable Equipment. (CMP-14-15-17). 8213

Mobile Equipment (CMP-14) 8748

Portable Power Distribution Unit. (CMP-15) 8640

Portable Structures (CMP-15)

Utilization Equipment (CMP-1)

Fastened-In-Place (CMP-12) 9473.

Fixed-In-Place (CMP-12) 9393.

Temporary Equipment (CMP-12) 9274

Related Item

• First Revision No. 7690	• First Revision No. 9396	• First Revision No. 8213	• First Revision No. 8748	• First Revision No. 8640	• First Revision No. 9473	• First Revision No. 9393

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Committee: NEC-P17

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Public Comment No. 896-NFPA 70-2021 [Global Input]

The Correlating Committee directs all panels to change the Section titles pertaining to reconditioning to "Reconditioned Equipment." and relocate the requirements to Section XXX.2 of the article if available or other section near the beginning of the article. If an article has multiple sections the panel should consider combining all reconditioning sections into subdivisions of XXX.2.

Additional Proposed Changes

File Name	Description	Approved
CN_259_Global.pdf	70_CN259	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 259 appeared in the First Draft Report.

The Correlating Committee directs all panels to change the Section titles pertaining to reconditioning to "Reconditioned Equipment." and relocate the requirements to Section XXX.2 of the article if available or other section near the beginning of the article. If an article has multiple sections the panel should consider combining all reconditioning sections into subdivisions of XXX.2.

Related Item

• Correlating Note No. 259

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
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Zip:
Submittal Date: Wed Aug 04 15:45:37 EDT 2021
Committee: NEC-P01

Public Comment No. 897-NFPA 70-2021 [Global Input]

The Correlating Committee requests that Panels 3, 7, 8, 9, 12, 13, 15, 16 and 18 reconsider the text "shall not be permitted to be" for clarification and ease of use. Simplifying the text to state "shall not be" is suggested as an alternative.

Additional Proposed Changes

File Name	Description	Approved
CN_260_Global.pdf	70_CN260	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 26 appeared in the First Draft Report.

The Correlating Committee requests that Panels 3, 7, 8, 9, 12, 13, 15, 16 and 18 reconsider the text "shall not be permitted to be" for clarification and ease of use. Simplifying the text to state "shall not be" is suggested as an alternative.

Related Item

• Correlating Note No. 260

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
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Submittal Date: Wed Aug 04 15:47:24 EDT 2021
Committee: NEC-P03

Public Comment No. 980-NFPA 70-2021 [Global Input]

The Correlating Committee notes that more than one related term is referenced in the definitions. Section 2.2.2.4 of the NEC Style Manual review this issue and the Correlating Committee establishes a Task Group with representation from Code-Making Panels 12 and 15 to review the terms "Long-Time Rating" and "Momentary Rating" to consider one definition of each term for consistency. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

Additional Proposed Changes

File Name	Description	Approved
12_CN_400_Global.pdf	12 CN400	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 400 appeared in the First Draft Report on First Revision No. 9274.

The Correlating Committee notes that more than one related term is referenced in the definitions. Section 2.2.2.4 of the NEC Style Manual review this issue and the Correlating Committee establishes a Task Group with representation from Code-Making Panels 12 and 15 to review the terms "Long-Time Rating" and "Momentary Rating" to consider one definition of each term for consistency. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

Related Item

- First Revision No. 9274

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
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Submittal Date: Thu Aug 05 13:51:38 EDT 2021
Committee: NEC-P12

Public Comment No. 1027-NFPA 70-2021 [Global Input]

The Correlating Committee notes that more than one related term is referenced in the definitions. Section 2.2.2.4 of the NEC Style Manual review this issue and the Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 15 and 16 to combine the terms where possible and to revise the definitions to comply with the NEC Style Manual. The four terms of "Exposed" and the term "Exposed Conductive Surfaces" need to be revised for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

Additional Proposed Changes

File Name	Description	Approved
15_CN_401_Global.pdf	70_CN401	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 401 appeared in the First Draft Report on First Revision No. 8683.

The Correlating Committee notes that more than one related term is referenced in the definitions. Section 2.2.2.4 of the NEC Style Manual review this issue and the Correlating Committee establishes a Task Group with representation from Code-Making Panels 1, 15 and 16 to combine the terms where possible and to revise the definitions to comply with the NEC Style Manual. The four terms of "Exposed" and the term "Exposed Conductive Surfaces" need to be revised for correlation. Each panel is assigned to revise the definitions under their purview to comply with the NEC Style Manual.

Related Item

- First Revision No. 8683

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
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Submittal Date: Thu Aug 05 20:09:24 EDT 2021
Committee: NEC-P01

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Public Comment No. 1961-NFPA 70-2021 [Global Input]

The Correlating Committee directs all panels to review all references to Article 722 under their purview. Class 1 system in Article 725 has been relocated to Article 722. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit public comments where necessary.

Additional Proposed Changes

File Name	Description	Approved
CN_375_Global.pdf	70_CN375	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 375 appeared in the First Draft Report.

The Correlating Committee directs all panels to review all references to Article 722 under their purview. Class 1 system in Article 725 has been relocated to Article 722. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit public comments where necessary.

Related Item

• Correlating Note No. 375

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 20:37:05 EDT 2021
Committee: NEC-P16

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Public Comment No. 1964-NFPA 70-2021 [Global Input]

The Correlating Committee accepts the action taken by CMP 6 to create new Article 315 (FR 8616).

The Correlating Committee advises that article scope statements are the responsibility of the Correlating Committee and the Correlating Committee accepts the panel action.

The Correlating Committee directs all panels to review all references to Article 311 under their purview. Article 311 has been relocated to Article 315. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit Public Comments where necessary.

Additional Proposed Changes

File Name	Description	Approved
CN_390_Global.pdf	70_CN390	✓

Statement of Problem and Substantiation for Public Comment

NOTE: The following CC Note No. 390 appeared in the First Draft Report.

The Correlating Committee accepts the action taken by CMP 6 to create new Article 315 (FR 8616).

The Correlating Committee advises that article scope statements are the responsibility of the Correlating Committee and the Correlating Committee accepts the panel action.

The Correlating Committee directs all panels to review all references to Article 311 under their purview. Article 311 has been relocated to Article 315. Each panel shall appoint a task group to review all necessary references to verify their accuracy and submit Public Comments where necessary.

Related Item

• Correlating Note No. 390

Submitter Information Verification

Submitter Full Name: CC on NEC-AAC
Organization: NEC Correlating Committee
Street Address:
City:
State:
Zip:
Submittal Date: Wed Aug 18 20:44:11 EDT 2021
Committee: NEC-P06