



ANALYSIS & CHANGES

An Educational Partnership



NEC 2020

Analysis of Changes

NEC-2020



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Analysis of Changes

NEC-2020

International Association of Electrical Inspectors
Richardson, Texas

Preface

The *National Electrical Code (NEC)* is updated on a three year *Code* cycle. The International Association of Electrical Inspectors (IAEI) publishes its *Analysis of Changes* every three years on the same publishing schedule as the *NEC*. This publication is based on the update, revisions, and changes to the 2020 *NEC*. IAEI has representation on every *NEC* Code making Panel (CMP) with two representatives (a Principal and an Alternate) on each CMP. For the 2020 *NEC* revision cycle, IAEI had (7) individuals represent IAEI as Chair Persons on the (18) CMPs.

The 2020 *NEC* process involves an *NEC* First Draft (FD) meeting, which was held in January 2018 at Hilton Head, SC. Suggested changes to the *NEC*, which are known as Public Inputs (PI) are reviewed at this First Draft meeting. The PIs that were acted upon favorably resulted in a First Revision (FR) to the First Draft (FD) of the 2020 *NEC*. The second public meeting for the *NEC* revision process is known as the *NEC* Second Draft (SD) meeting. This meeting was held in October of 2018 at San Diego, CA. Submitted comments at this meeting are known as Public Comments (PC). The successful PCs resulted in a Second Revisions (SR) to the Second Draft (SD) of 2020 *NEC*. Appeals were heard and voted upon for acceptance of the 2020 *NEC* at the NFPA Annual Conference at San Antonio, TX in June 2019. The NFPA Standards Council will issue the 2020 *NEC* in August 2019 with a publication date of September of 2019.

There were a total of **3730** Public Inputs (PI) submitted from interested participants, which resulted in **1400** First Revisions (FR) and **5** First Correlating Revisions (SCR) to the First Draft (FD) of the 2020 *NEC*. There was a total of **1930** Public Comments (PC), which resulted in **635** Second Revisions (SR) and **73** Second Correlating Revisions (SCR) to the Second Draft (SD) of the 2020 *NEC*. This IAEI publication is a report on the most significant changes to the 2020 *NEC*. The revisions reported on in this publication were based on the Second Draft (SD) of the 2020 *NEC*. While IAEI takes every precaution to deliver the most accurate account of the changes to the latest edition of the *NEC*, these revisions are subject to alterations from the time of publication of the *Analysis of Changes* to the deliverance of the final version of the 2020 *NEC*.

KEY TERMS USED IN THE ANALYSIS OF CHANGES

In order to grasp the full understanding of the changes reported on in this publication, several key terms or acronyms need to be understood. Some of these terms are as follows:

<i>NEC</i>	<i>National Electrical Code</i>
FD	First Draft (<i>NEC</i>)
SD	Second Draft (<i>NEC</i>)
PI	Public Input
PC	Public Comment
FR	First Revision
GFR	Global First Revision
DFR	Detailed First Revision
SR	Second Revision
GSR	Global Second Revision
DSR	Detailed Second Revision
CMP	Code Making Panel
CI	CMP Committee Input
<i>NEC CC</i>	<i>NEC</i> Correlating Committee
NITMAM	Notice of Intent to Make a Motion
TIA	Tentative Interim Amendment
AHJ	Authority Having Jurisdiction. 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 (<i>NEC</i> Article 100). This could be the Building Official, Electrical Inspector, Fire Marshall, etc.

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General

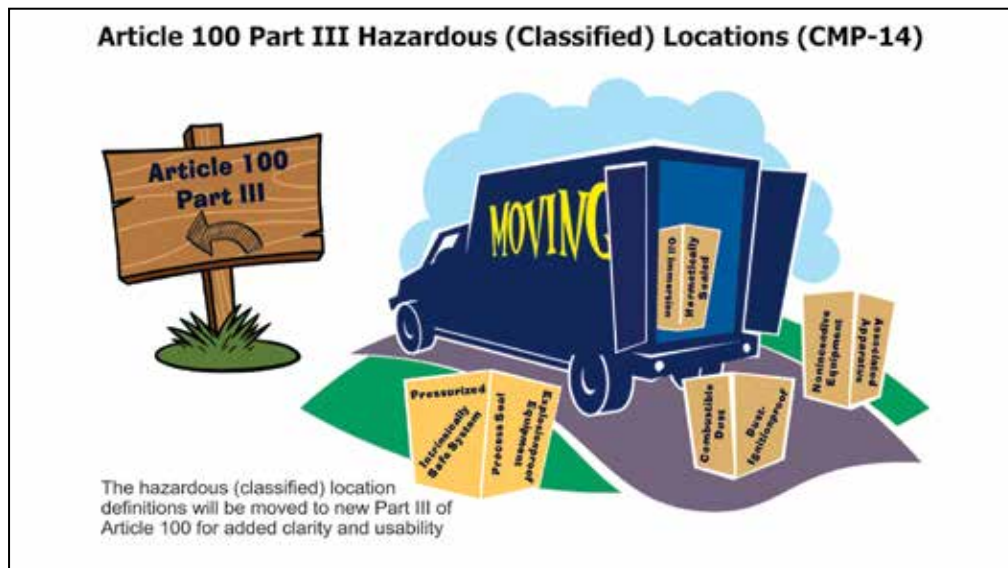
Articles 100 – 110

KEY CHANGES

- **100** Definitions
- **110** Requirements for Electrical Installations

Article 100 — Definitions

Scope and Part III, Hazardous (Classified) Locations



100 Part III Hazardous (Classified) Locations

Type of change: Revision

Change at a Glance: The phrase, “Definitions are also found in XXX.2 sections of other articles” was added and the Scope of Article 100 is modified to include **new Part III** for “**Hazardous (Classified) Locations.**”

2017 Requirement: Definitions that applied to hazardous (classified) locations were relocated to Article 100 and these relocated hazardous (classified) location definitions included the term “[as applied to Hazardous (Classified) Locations]” immediately following the identification of the defined term prior to the actual definition.

2020 Requirement: A new Part III of Article 100 titled “Hazardous (Classified) Locations (CMP-14)” was created and the relocate 2017 *NEC* definitions with bracketed text [as applied to Hazardous (Classified) Locations] were relocated to new Part III.

CODE LANGUAGE

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. In general, only those terms that are used in two or more articles are defined in Article 100. Other definitions are included in the article in which they are used but may

be referenced in Article 100. Definitions are also found in XXX.2 sections of other articles.

Part I of this article contains definitions intended to apply wherever the terms are used throughout this *Code*. Part II contains definitions applicable to installations and equipment operating at over 1000 volts, nominal. Part III contains definitions applicable to Hazardous (Classified) Locations.

Analysis of Changes: During the 2017 *NEC* revision cycle, several definitions that applied to hazardous (classified) locations were relocated to Article 100 of the *NEC*. These definitions were previously at 500.2. Section 2.2.2.1 of the 2015 *NEC* Style Manual states, “In general, Article 100 shall contain definitions of terms that appear in two or more other articles of the *NEC*.” Prior to this 2017 *NEC* relocation, CMP-14 had found Article 500, and in particular 500.2, a safe “landing spot” for any definition that applied to more than one hazardous (classified) location article rather than locate these multi-article definitions in Article 100 (as prescribed by the *NEC* Style Manual). Before the 2008 *NEC*, any definition located in Article 100 was under the preview of CMP-1 and any CMP sending a definition to Article 100 “lost control” or responsibility of that particular definition. This all changed with the 2008 *NEC* when responsibility of a definition located in Article 100 and its technical meaning remained with the CMP most associated with a specific definition. For example, CMP-5 has responsibility over definitions pertaining to grounding and bonding such as the definition of “Bonded,” “Grounding Electrode,” and so forth even though these definitions are located in Article 100.

For the 2017 *NEC*, these relocated hazardous (classified) location definitions included the term “[as applied to Hazardous (Classified) Locations]” immediately following the identification of the defined term prior to the actual definition. This was a good way to key users of the *Code* to these hazardous (classified) location definitions, but they were still hard to distinguish from the other Article 100 definitions. For the 2020 *NEC*, a new Part III titled “Hazardous (Classified) Locations (CMP-14)” was created. This new addition will relocate those 2017 *NEC* definitions with bracketed text [as applied to Hazardous (Classified) Locations] to new Part III for added clarity and usability. Hopefully, this will be the end of the road for Identifying these hazardous (classified) location definitions and will further assist with getting hazardous (classified) location article users to “follow the path” from previous 500.2 to Part III of Article 100. Creating this new Part III and relocating these definitions to their own part of Article 100 will also help users of

the *Code* understand that these definitions only apply to hazardous (classified) location articles in Chapter 5.

There was also a new sentence added to Scope of Article 100 to indicate that definitions can also be found at “XXX.2 of other articles.” This was in conjunction with an effort this *Code* cycle to make a distinction to definitions found throughout the *Code*, particularly at XXX.2 of individual articles. With the 2020 *NEC*, you will find two distinct statements followed by applicable definitions. One statement will say, “***The definitions in this section shall apply only within this article.***” The other leading statement that can be found at XXX.2 will indicate that, “***The definitions in this section shall apply within this article and throughout the Code.***” This will allow definitions that pertain primarily to specific articles to remain in those articles.

First Revisions: GFR 8758
Public Inputs: PI 1202, PI 3618

Article 100 — Definitions

Accessible (as applied to equipment)



100 Definitions — Accessible

Type of change: Revision

Change at a Glance: The definition of Accessible (as applied to equipment) was revised for clarity and usability.

2017 Requirement: The definition of *Accessible* (as applied to equipment) was defined as “admitting close approach; not guarded by locked doors, elevation, or other effective means.”

2020 Requirement: The definition of *Accessible (as applied to equipment)* now is specified as “capable of being reached for operation, renewal, and inspection.”

CODE LANGUAGE

Accessible (as applied to equipment). Admitting close approach; not guarded by locked doors, elevation, or other effective means. Capable of being reached for operation, renewal, and inspection. (CMP-1)

Analysis of Changes: The definition of *Accessible (as applied to equipment)* was updated and rewritten for the 2020 *NEC*. This definition first appeared in the 1947 edition of the *NEC* as “admitting close approach because not guarded by locked doors, elevation, or other effective means.” This definition stayed very close to this original definition until this edition of the *Code*. The definition was revised for clarity and will more closely correlate this definition to that of its closely related definition, “Readily Accessible.”

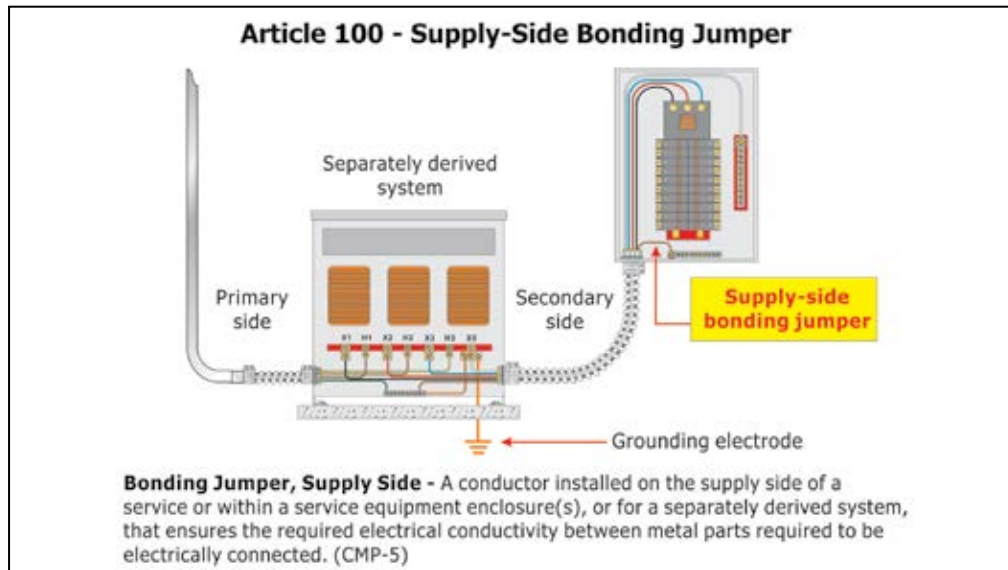
The previous definition of “Accessible (as applied to equipment)” seemed to contradict other sections of the *Code*. The use of a locked equipment room is common practice under controlled or supervised conditions. In the previous definition, by stating that equipment is not accessible, if “guarded by locked doors” was in contradiction with 110.26(F) (Locked Electrical Equipment Rooms or Enclosures), which states that “electrical equipment rooms or enclosures housing electrical apparatus that are controlled by a lock(s) shall be considered accessible to qualified persons.” This could cause inconsistency in *Code* enforcement.

The former definition also stated that equipment could be considered not accessible by “elevation.” The *Code* demonstrates that equipment can still be considered accessible, despite being elevated. Several sections of the *Code*, such as 110.26(A)(4) (Limited Access Working Space), 300.23 (Panels Designed to Allow Access.), and 600.21(F) (Ballasts, Transformers, Electronic Power Supplies, and Class 2 Power Sources Installed Above Suspended Ceilings) indicate equipment installed above lay-in ceilings as accessible while being “elevated.” The previous definition of “Accessible” also used the term “other effective means.” This term can be considered vague and open to interpretation. The revised definition is clear and concise

First Revisions: FR 8304
Public Inputs: PI 1009

Article 100 — Definitions

Supply-Side Bonding Jumper



100 Definitions — Supply-Side Bonding Jumper

Type of change: Relocation

Change at a Glance: The definition of a **Supply-Side Bonding Jumper** was relocated from 250.2 to Article 100.

2017 Requirement: The definition for **Bonding Jumper, Supply-Side** was located in Article 250 at 250.2.

2020 Requirement: The definition for **Bonding Jumper, Supply-Side** was relocated from 250.2 to Article 100 as the term is used in more than just Article 250.

CODE LANGUAGE

Bonding Jumper, Supply-Side. 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)

Analysis of Changes: The term “supply-side bonding jumper” and its definition were first introduced in the 2011 edition of the *NEC*. This term was also introduced at 250.30(A)(2) for grounding of separately derived ac systems. Prior to the 2011 *NEC*, the term “equipment bonding jumper” was used at this location and described a fault carrying conductor for a separately derived system. This new definition of a supply side bonding jumper was necessary to ensure the proper identification and installation of bonding conductors in-

stalled within or on the supply side of service equipment and between the source of a separately derived system and the first disconnecting means. An equipment bonding jumper completes the equipment grounding conductor path and are installed on the load side of the overcurrent device and are sized from Table 250.122 based upon the rating of the overcurrent protective device whereas the size of a supply side bonding jumper is installed on the line or supply side of an overcurrent device and are sized by 250.102(C) from Table 250.102(C)(1) and the 12½ percent rule. As a result, these terms could not be combined in one definition.

For the 2020 *NEC*, the definition of a supply-side bonding jumper was relocated from 250.2 to Article 100. The term “supply-side bonding jumper” appears in Articles 230, 250, 310, 408, 450, and 694. This definition is properly relocated to Article 100 to comply with Section 2.2.2.1 of the *NEC* Style Manual, which in general recommends that a word or term that appears in more than one article be located in Article 100. Interesting, the original proposal to introduce this definition to the 2011 *NEC* recommended it be located in Article 100.

Supply-side bonding jumper provides electrical continuity between the supply source (such as the utility transformer enclosure) and the various enclosures of the service equipment. It connects bonding bushings (where used) to service grounded (neutral) conductor in service equipment enclosure(s). They carry ground-fault current from ground faults that occur on the supply side of the main overcurrent protection and provides a low impedance path for the ground-fault current to return to the source of the electrical system. Supply-side bonding jumpers can be non-flexible metal raceway or a wire type conductor. Service grounded conductor can sometimes also serve as the supply-side bonding jumper.

First Revisions: DFR 9007

Public Inputs: PI 490

Article 100 — Definitions

Dormitory Unit



100 Definitions — Dormitory Unit

Type of change: New

Change at a Glance: A new definition for a “Dormitory Unit” was introduced at Article 100.

2017 Requirement: The terms dormitory unit(s) or dormitories was used in (4) different articles but was not defined in the *NEC*.

2020 Requirement: A new definition titled “Dormitory Unit” was accepted to be included in the definitions found in Article 100 of the *NEC*.

CODE LANGUAGE

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)
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Analysis of Changes: The term “dormitory unit” or “dormitories” was used (8) times in (4) different articles in the 2017 *NEC* and (9) times in the 2020 *NEC*. This term needed to be defined in order to promote consistency with enforcement and interpretation of the requirements for such things as GFCI requirements and tamper-resistant receptacles in dormitories. The term “Dormitory Unit” is being added to Article 100 and defined as it is used in more than one location within the *NEC* and the use of the term is the same throughout the *Code*. Dormitory units are required to be provided with arc-fault circuit interrupter (AFCI) protection as mentioned at 210.12(B). Tamper-resistant receptacles are required for dormitory units as described at 406.12(7). Without an *NEC* definition of a dormitory unit, installers and inspectors alike experience a wide variety of interpretation as to what constitutes a dormitory unit. Do these requirements apply to a bunkhouse? How about sleeping units or cabins at church camps, summer-camp cabins, lodges, homeless shelters, etc.? Applying the new definition to these types of facilities will greatly aid in determining what is a dormitory unit and what is not. Please note that the new definition does not specifically reference the words college, university, or school. While a dormitory unit can certainly be found at a typical college campus, a dormitory unit is not limited to a learning institution.

First Revisions: FR 7688

Second Revisions: SR 7515

Public Inputs: PI 3225, PI 3691, PI 2806, PI 2324, PI 3603

Public Comments: PC 421, PC 1375, PC 379, PC 528, PC 1378

ANALYSIS OF CHANGES, NEC[®] 2020

Are you ready?

Written by IAEL industry-expert representatives to the *NEC* Code-Making Panels, this comprehensive guide details more than 250 of the most essential changes across more than 80 Articles in the 2020 *Code*.

Analysis of Changes provides overviews for each of the changes; compares the changes with the 2017 *NEC*; and provides comprehensive in-depth analysis. In addition to learning about the four new 2020 Articles (Overvoltage Protection, Medium Voltage Conductors and Cable, Type P Cable, and General Requirements for Communications Systems), you'll learn about improvements in Code language on:

- GFCI protection
- Grounding conductors
- Lighting load calculations
- Surge protection and outdoor emergency disconnects for dwelling units
- Circuit current rating for switchboards, switchgear, and panelboards
- Grounding and bonding of HVAC equipment on rooftops
- Areas covered and not covered in health care facilities, manufactured buildings, and relocatable structures
- GFPE and GFCI protection at marinas, boatyards, and docking facilities
- And much more.

