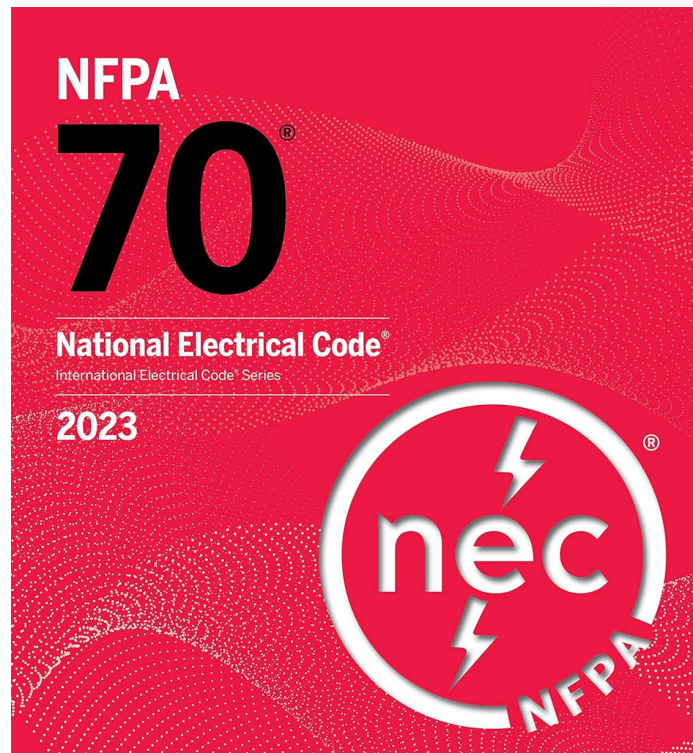




Summary of NEC Code changes 2023 Chapters 1 and 2



4 PDH

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NEC Code changes 2023

Chapters 1 and 2

Introduction:

The National Electrical Code (NEC), is a set of standards for the safe installation of electrical wiring in the United States, and is revised every three years to account for the latest safety and technology.

The NEC is made up of 18 CMPs (Code Making Panel)s, each with representatives from different groups, including manufacturers, inspectors, users, and labor. The National Fire Protection Association (NFPA) sponsors the development of the NEC

The abbreviated CMP has been repeated constantly throughout this course and it stands for "Code Making Panel".

Code Making Panel is a group of unpaid people who are in charge of processing all the proposed changes, removals and additions of specific bits of language to the next edition of the National Electrical Code. Each CMP (Code Making Panel) oversees only a part of the corpus of the NEC.

Summary of NEC Code changes 2023

Chapter 1

Article 90

Articles 100-110

Article 100,

Definition

Summary of change:

The NEC Style Manual was updated to require that all definitions be located in Article 100 and organized alphabetically. It allows for the use of similar terms and acronyms, and includes provisions for electronic search terms. During the relocation process, it was discovered that multiple terms had different definitions within the Code, which were addressed in the revision. A number following a defined term indicates that the definition is specific to that article. All definitions are now in Article 100, with new structural requirements for definitions implemented for this cycle.

What is its effect on industry.

This relocation allows electrical professionals to find all definitions in a single location, ensuring consistency with other codes by placing definitions in one chapter. This change makes referencing material easier.

Article 100

Accessible (applied to wiring methods)

Summary of change:

The revision to this definition clarifies that wiring and electrical equipment made inaccessible by piping, ductwork, drains, raceways, or other mechanical systems are not considered accessible in terms of wiring methods. Accessing the wiring within this equipment can be very difficult, often requiring the removal or disassembly of piping, raceways, or other components. Building-related items such as electrical raceways, plumbing pipes, and mechanical systems are considered accessible since they are not part of the building's structure or finish

CMP (Code Making Panel) -1 modified the definition of "Accessible" as it applies to wiring methods. The revision clarifies that wiring and electrical equipment made inaccessible by piping, ductwork, drains, raceways, or other mechanical systems is not considered accessible in terms of wiring methods.

What is its effect on industry.

This revised wording clarifies the meaning for electrical professionals, aiding both the AHJ and installer in ensuring that equipment requiring access, as it applies to wiring methods, is correctly installed during the initial installation.

Article 100

Class 4 circuit

Summary of change:

The definition resulted from the work of the Packet Energy Transfer (PET) systems Task Group, which aimed to provide guidance on this innovative technology. Previously referred to by various names such as Packet Energy Transfer (PET), Digital Electricity (DE), Pulsed Power, Smart Transfer Systems, and Fault Managed Power (FMP), this emerging technology

involves a fault-managed system that verifies the presence and correct operation of powered devices before applying power greater than Class 2. In case of a fault, the system terminates output power.

To accommodate this technology, the task group decided to introduce a new Article 726 in the NEC (National Electrical Code), as existing articles did not adequately cover its requirements. This technology utilizes circuitry and software for fault protection. Protection for Class 4 circuits includes considerations such as voltage levels, pulse widths, repetitive pulses, time to shut-off, and stored charge from cable capacitance and equipment. It's crucial to note that this protection cannot be provided by installers or Authorities Having Jurisdiction (AHJs) in the field; instead, reliance must be placed on safety standards and equipment listings.

Ensuring safety throughout the design, implementation, installation, and operation of this emerging technology is paramount. These requirements are essential for the safe deployment and use of these systems.

What is its effect on industry.

This updated definition aims to offer clear guidance to electrical professionals as they integrate this new technology into future installations. Proper and safe installation is crucial to ensuring the safety of end users.

Articles 100

Definitions- Countertop

Summary of change:

The new definition of "counter" (countertop) has been introduced to assist Code users in correctly applying it within the built environment. The primary distinction between these surfaces lies in the amount of spillage they may typically encounter. Users of the Code will be directed to industry standards that provide guidance on the appropriate placement of receptacles in these specific locations, as outlined in this updated definition and accompanying instructive note.

CMP (Code Making Panel)-2 introduced a new definition to clarify what qualifies as a "Counter (Countertop)" location for users of the Code.

What is its effect on industry.

Installer and enforcement confusion, as well as frequent product misapplications, have been observed when electrical equipment is incorrectly installed on countertop surfaces. In some instances, the equipment used was unsuitable or not listed for these specific locations. The introduction of these new definitions and accompanying informational notes is intended to assist both installers and Authorities Having Jurisdiction (AHJs) in better understanding the appropriate application of electrical equipment in these contexts.

Article 100**Definitions- Energy management system****Summary of change:**

At the direction of the Correlating Committee, the Energy Management Task Group was tasked with reviewing all existing and proposed definitions and requirements related to terms such as load management, load management system, power control system, energy management system, and related concepts. The goal was to ensure a coordinated approach and understanding throughout the Code.

An energy management system includes a monitor, communication equipment, a controller and timer, and other devices responsible for monitoring or controlling an electrical load, power production, or storage source.

CMP (CODE MAKING PANEL) -13 developed a new definition for an energy management system

What is its effect on industry.

Energy management systems are increasingly common in the built environment. It is now standard practice to monitor electricity usage and supplement utility power from the grid with alternative sources such as photovoltaic (PV) panels, wind turbines, fuel cells, and more. This new definition provides guidance to electrical professionals on the typical components that make up these systems

Article 100

Definitions- Feeder Assembly

Summary of change:

Previously, the NEC articles under CMP (Code Making Panel)-7 had various definitions that essentially described the power cord assembly. By consistently introducing the term "feeder assembly" throughout Articles 550, 551, and 552, it was clarified that these conductors, although connected to a receptacle, are considered feeders. This distinction is important to avoid the requirement for GFCI protection, addressing concerns about "unwanted tripping" caused by the accumulation of leakage current from multiple portable appliances at the source.

What is its effect on industry.

CMP (Code Making Panel)-7 introduced a new definition for "Feeder Assembly" to Article 100. This definition ensures consistency when referring to the factory cord or cable assembly that connects electrical equipment to the panelboard of a mobile home, recreational vehicle, or park trailer.

Article 100

Definitions – Fibers / Flying, Combustible

Summary of change:

This change was part of the Standards Council directive to CMP (Code Making Panel)-14 and other Committees to resolve conflicts among the documents. It resulted from the efforts of members from several technical committees working within a Task Group on Combustible Dusts. CMP (Code Making Panel)-14 added informational notes following the new definition to include specific information related to combustible metal fibers and flyings.

CMP (Code Making Panel)-14 developed a new definition for "Fibers/Flyings, Combustible" (Combustible Fibers/Flyings), which includes three informational notes that specify particle size and types of fibers/flyings.

What is its effect on industry.

The new definitions and informational notes will assist all electrical professionals involved in designing, installing, and inspecting in these environments. They provide guidance for verifying code compliance and determining the size and types of various combustible fibers and flyings.

Article 100**Definitions- Ground Fault****Summary of change:**

The term "metallic" was changed to "metal" to align with the NEC Style Manual.

CMP (Code Making Panel)-5 has replaced the word "metallic" with "metal" in the definition of Ground Fault in Article 100

What is its effect on industry.

It is a minor change, but it enhances clarity and usability by updating the wording of the definition from "metallic" to "metal."

Article 100**Impedance ground conductor****Summary of change:**

There was no definition for a conductor connecting the neutral point of an impedance grounded system to the grounding impedance device, leading to inconsistent understanding of this conductor. It did not meet the definition of a neutral conductor since it is not intended to carry current under normal conditions, nor did it qualify as a grounding electrode conductor. The impedance grounded conductor is designed to carry fault current reduced by a designed impedance.

CMP (Code Making Panel)-5 has added a new definition for "Grounded Conductor, Impedance" to Article 100

What is its effect on industry.

Electrical professionals will now have an accurate and consistent definition for this conductor and its operation within an electrical system.

Article 100

Impedance ground system

Summary of change:

Before the 2023 NEC code cycle, there was no definition for an impedance grounded system. This absence led to inconsistent use and understanding of these systems, particularly in the context of high impedance grounded neutral systems and impedance grounded neutral systems.

CMP (Code Making Panel)-5 established a new definition for "Grounded System, Impedance" in Article 100.

What is its effect on industry.

Electrical professionals will now have a definition that is accurate and consistently defines elements that make up this system.

Article 100

Insight From

Summary of change:

The definition was revised to ensure clarity and consistent enforcement, as mandated by the NEC Style Manual. Refer to the updated section on "In Sight From (Within Sight From), (Within Sight)" in 110.29 for the revised requirements.

CMP (Code Making Panel)-1 amended the definition of "In Sight From (Within Sight From), (Within Sight)" in accordance with the NEC Style Manual, which stipulates that definitions should not include requirements or recommendations.

What is its effect on industry.

The updated definition clarifies that equipment is considered "in sight" if it is visible and located within 15 meters (50 feet) of other equipment, ensuring that electrical professionals understand this criterion.

Article 100

Likely to become energized

Summary of change:

The phrase "Likely to become energized" was not previously defined in the NEC despite its frequent use, appearing 25 times in various sections, with only seven occurrences in Article 250. This lack of clarity led to differing interpretations from one jurisdiction to another, causing frustration among electrical professionals when applying NEC requirements. An example is the application of 250.104(B) concerning other metal piping.

Annex B of the NEC Style Manual defines "likely to become energized" as a "failure of insulation on." However, since most NEC users do not reference the NEC Style Manual, it was necessary to provide a definition within the NEC itself. It's crucial to distinguish between what can become energized and what is likely to become energized.

CMP (Code Making Panel)-5 introduced a new definition for "Likely to Become Energized," which was included in Article 100 of the NEC.

What is its effect on industry.

With the new definition introduced by CMP (Code Making Panel)-5, electrical professionals will have a precise understanding of the term "Likely to Become Energized." This clarity should help eliminate any confusion or misunderstandings when this phrase is used in the NEC.

Article 100

Load Management

Summary of change:

This definition was developed by the Energy Management Task Group, which was responsible for reviewing current and proposed definitions and requirements related to load management, load management systems, power control systems, energy management systems, and other related terms. The goal was to ensure a coordinated approach and understanding of these concepts throughout the NEC. As a result, the task group proposed several public comments regarding energy management items in the NEC, aligning the definition with Article 750 and specifying that load management is a function of a listed energy management system.

CMP (Code Making Panel)-7 introduced a new definition for "Load Management" in the NEC.

What is its effect on industry.

The new definition of "Load Management" added by CMP (Code Making Panel)-7 will offer clarity and guidance to electrical professionals dealing with load management and energy management systems.

Article 100

Definitions- Normal high- water level

Summary of change:

Previously, there was no consistent method for determining the elevation next to a body of water to validate or confirm the placement of electrical equipment or the location of the electrical datum plane near the water's edge. To address this, the term was added to the definition of the electrical datum plane for further clarification.

CMP (Code Making Panel)-7 included the definition of "Normal High-Water Level" in Article 100 to assist Authorities Having Jurisdiction (AHJs) in

determining the elevation for electrical datum plane distances as used in Articles 551, 555, and 682.

What is its effect on industry.

This definition will provide an easier and more consistent way to determine the elevation for the electrical datum planes.

Article 100

PV DC circuit

Summary of change:

The previous terms and definitions were challenging to apply to modern designs. To address this, the panel updated the definitions and relocated them to Article 100, aligning with the 2020 NEC Style Manual requirements.

CMP (Code Making Panel)-4 introduced new terms and updated definitions related to PV System DC elements. The term "PV DC Circuit" (or "PV System DC Circuit") now encompasses both PV Source Circuits and PV String Circuits.

Specifically:

- **PV System DC Circuit:** Includes series and/or parallel DC circuit conductors between the modules and combiners, inverters, or PV system DC disconnect.
- **PV Source Circuit:** A subset of a PV System DC Circuit.
- **PV String Circuit:** Also a subset of a PV System DC Circuit.

What is its effect on industry.

The new terms and definitions for PV system DC circuit conductors and elements align with common usage, providing additional clarity for users of the NEC.

Article 100

Definitions- Restricted industrial establishment

Summary of change:

As a result of this action, the requirements were expressed more concisely, and unnecessary or redundant text for defining an industrial facility was removed. The definition was crafted to eliminate the phrase "In industrial establishments with restricted public access, where the conditions of maintenance and supervision ensure that only qualified persons service the installation." This phrase was repeated in over 40 subdivisions concerning wiring methods permitted in hazardous (classified) locations. This change also fulfilled an NFPA Correlating Committee request for all Code panels to reduce redundant text that would not impact the Code requirements.

Restricted Industrial Establishment is a new definition in Article 100, introduced by CMP (Code Making Panel)-14. This definition aligns with requirements for installations specifically located within hazardous (classified) locations.

What is its effect on industry.

The introduction of the new definition "Restricted Industrial Establishment" will necessitate the entire electrical industry to study and understand its implications. However, this change does not alter the intent of the Code.

According to this revision, documentation containing this definition must be submitted to the authority having jurisdiction (AHJ) for review and approval along with the plans submitted by the designer of record. The new definition retains language regarding "Qualified Persons," which will require the AHJ to verify that personnel installing, maintaining, operating, and inspecting these facilities are qualified for these industrial establishments.

Article 100

Servicing

Summary of change:

The introduction of the new definition distinguishes between reconditioning and the normal servicing, maintenance, and repair of electrical equipment, which previously caused confusion. This clarification will help ensure the operational performance of electrical equipment throughout its lifespan. For further guidance on the proper application of rules related to reconditioning, refer to NEMA CS 100-2020, NEMA Technical Position on Reconditioned Electrical Equipment.

Servicing is a new definition in Article 100, introduced by CMP (Code Making Panel)-1. This definition clarifies the servicing of electrical equipment to assist in maintenance and repair activities.

What is its effect on industry.

The inclusion of the "Servicing" definition will aid electrical professionals in maintaining and preserving large pieces of equipment such as switchgear and switchboards, commonly found in high-rise buildings, hospitals, schools, office buildings, and critical installations.

For further guidance on servicing equipment, NFPA 70B, Recommended Practice for Electrical Equipment Maintenance, can be consulted in addition to applicable manufacturer and industry standards.

Article 100

Definitions- Short Circuit

Summary of change:

The term "Short Circuit" is referenced in various locations throughout the NEC, including 90.8(B), the definition of fault current, and the definition of an overload, among others. It would be beneficial to include a definition of this term in Article 100.

This addition is necessary to ensure that users of the Code have a clear understanding of what constitutes a short circuit. Currently, users must refer to other industry manuals and documents to determine the definition of this term. Prior to its inclusion in Article 100 for the 2023 cycle, the definition could be found in IEEE 100-1992, The New IEEE Standard Dictionary of Electrical and Electronic Terms, 5th Edition.

CMP (Code Making Panel)-10 has added a new definition for "short circuit" to enhance the usability of the NEC.

What is its effect on industry.

The addition of this definition within the NEC will assist electrical professionals in locating and understanding the meaning of the term "short circuit," improving its correct application. This will reduce misapplication of the term, leading to more accurate usage when discussing electrical issues.

Article 100

Definitions- Transformer

Summary of change:

The term "transformer" is referenced approximately 1500 times in the NEC. Prior to the 2023 NEC, a definition was not included in 450.2 or Article 100. The new definition covers both single and polyphase equipment operating by electromagnetic induction. Importantly, the definition avoids stating "changing voltage or current" because isolating transformers filter noise without altering nominal voltages.

CMP (Code Making Panel)-9 introduced a new definition for the term "transformer."

What is its effect on industry.

The inclusion of a definition for "transformer" will enhance the understanding of electrical professionals who use the NEC for the installation of these devices.

Article 100

Definition – Work surface

Summary of change:

The inclusion of the "work surface" definition in the NEC helps users understand the difference between a countertop and a work surface, which are sometimes used interchangeably. The key difference lies in the amount of spillage these locations may encounter. The definition directs users to industry standards that assist in the proper application of receptacles in these locations, as discussed in the new definition and instructive note.

CMP (Code Making Panel)-2 added a new definition to clarify what constitutes a "Work Surface" location.

What is its effect on industry.

The inclusion of these new definitions and informational notes is crucial, as there has been confusion among installers and enforcement authorities, leading to frequent product misapplications and incorrect installations of electrical equipment on work surfaces. In some instances, the equipment used was unsuitable or unlisted for these locations. These additions should aid installers and Authorities Having Jurisdiction (AHJs) in better understanding these specific locations and the suitable equipment for them.

Chapter 1

Article 110.3 [A]

Examination, identification, Installation, Use , and Listing of equipment

Summary of change:

Cybersecurity is a technological hazard that can disrupt electronic equipment significantly. It should be taken into account when assessing equipment safety. Cyberattacks can interfere with and disable life-safety equipment and other critical systems that perform essential functions.

- CMP (Code Making Panel)-1 has added a new list item number 8 that addresses cybersecurity for network-connected life-safety equipment. While this does not require electrical professionals to conduct a cybersecurity evaluation, it is important to acknowledge cybersecurity as a potential hazard. Item number 8 now includes cybersecurity as a factor that needs to be considered and evaluated.
- Informational Note No. 3 introduces the IEC 62443 series of standards for Industrial Automation and Control Systems, the UL 2900 series of standards for Software Cybersecurity for Network-Connectable Products, and UL 5500, the Standard for Remote Software Updates. These standards provide valuable information to mitigate cybersecurity issues involving electrical equipment.

What is its effect on industry.

Electrical professionals now have access to information regarding cybersecurity concerns and are required to consider these issues when evaluating network-connected life safety equipment. The safety of individuals using this equipment is crucial to their family and friends.

Article 110.3

[B] Installation and Use

Summary of change:

QR codes are increasingly found on a variety of items, enabling users to access extensive information about a product. Listing standards for Arc-Fault Circuit-Interrupters now permit the use of printed materials, QR codes, and internet addresses to obtain information. CMP (Code Making Panel)-1 created a new informational note allowing the use of a QR code to access installation instructions, assuring electrical professionals that QR codes, when available, are an acceptable method for finding this important information.

What is its effect on industry.

Electrical professionals now have a new technological tool to access crucial information about electrical devices and equipment. QR codes, which are increasingly appearing on various items, are also recognized in this informational note as being present on electrical items.

Article 110. 14

(A) Terminals

Summary of change:

This revision will clarify the type of connection being discussed concerning terminations in various types of electrical equipment. The product's listing will also determine the connection's acceptability. For example, a faceplate cover for lighting or USB use that uses a friction-type connection to the receptacle's termination screws. CMP (Code Making Panel)-1 added the term "electrical" to specify the type of connection (as opposed to mechanical) for additional clarity.

What is its effect on industry.

This change will reduce any confusion that may have existed in the electrical industry regarding whether these termination points require an electrical or mechanical type of connection.

Article 110.16

[B] Arc- Flash hazard warnings- Service equipment

Summary of change:

Labeling requirements for service equipment ratings, where this section applies, have been changed from 1200 amperes to 1000 amperes or more for enhanced safety and protection of electrical professionals.

- This change clarifies that the requirements apply to both service equipment and feeder-supplied equipment. It was necessary to add the phrase "arc flash" to specify the type of permanent label required for this equipment. The revision from 1200 to 1000 amperes was made to advance and protect worker safety. The four previous list items and exception were deleted, and the label now references applicable industry practice.
- Labeling requirements have been changed by CMP (Code Making Panel)-1 for service equipment from 1200 amperes to 1000 amperes or more in Section 110.16(B). CMP (Code Making Panel)-1 added

"Feeder Supplied Equipment" to the title, included the phrase "arc flash" for the type of permanent label required, and reduced the equipment rating from 1200 to 1000 amperes in Section 110.16(B).

What is its effect on industry.

This change will help electrical professionals better maintain and operate large service equipment safely according to applicable industry standards.

Article 110.17

Servicing and Maintenance of Equipment

Summary of change:

The use of replacement parts during servicing and maintenance activities requires identified replacement parts verified according to applicable product standards. A list of options is provided for the approval of these replacement parts. Parts must be provided by either the original equipment manufacturer (OEM), designed by an engineer with applicable experience, or approved by the AHJ. The manufacturer's instructions and any additional information included in the listing must be followed. Applicable industry standards should also be consulted for additional information. New language acknowledges that this information may not always be available and provides a path for the authority having jurisdiction (AHJ) to provide approval.

- Informational Note No. 1 offers guidance for approving parts when the equipment lacks a listing mark or when OEM parts are no longer available.
- Informational Note No. 2 states that the new language aligns with NFPA 70B, The Recommended Practice for Electrical Equipment Maintenance, which also contains a definition for "Electrical Preventive Maintenance."
- CMP (Code Making Panel)-1 added language in Section 110.17 restricting service and maintenance of equipment to qualified persons trained to perform the work.

What is its effect on industry.

This will help electrical professionals when servicing or replacing parts for electrical equipment, ensuring that the equipment operates correctly and safely.

Article 110.20**Reconditioned Equipment****Summary of change:**

New text in this section addresses whether reconditioned equipment is permitted by the NEC. The language requires the use of identified replacement parts verified under applicable standards, provided by the original equipment manufacturer (OEM), or designed by an engineer with applicable experience. This aligns with similar requirements for reconditioned parts used during servicing and maintenance.

- There are two first-level subdivisions (A) and (B) dealing with equipment that is required to be listed or equipment not required to be listed.
 - For equipment required to be listed, reconditioned equipment must either be listed or have a field label stating it has been reconditioned using information from the OEM.
 - For equipment not required to be listed, there are two options:
 1. The equipment can be listed or field labeled as reconditioned.
 2. The equipment can be reconditioned per the instructions provided by the OEM.
 - A third option (C) is permitted when neither option (A) nor (B) is viable. The authority having jurisdiction (AHJ) can approve reconditioned equipment when listing, field labeling, and OEM guidance are unavailable.
- This addition grants the AHJ the ability to review the documentation regarding the changes made to the equipment. Based on this review, the AHJ may approve the equipment.

CMP (Code Making Panel)-1 established general requirements in Section 110.20 that will apply to all reconditioned equipment.

What is its effect on industry.

This new section provides electrical professionals with guidelines for inspecting, evaluating, and approving reconditioned equipment. It aims to alleviate frustration in the field among installers, manufacturers, and AHJs when this equipment is being installed or considered for repair or replacement.

Articles 110.21**[B][1] Markings – Field – Applied hazard marking****Summary of change:**

A field-applied hazard marking is an important sign or label that must be durable enough to remain with the electrical equipment in wet, damp, dry, or even corrosive environments. This change applies to signs and labels attached to items such as ingress and egress doors to areas containing electrical equipment. In some environments, this might include using rivets to ensure these hazard markings (caution, warning, or danger) are securely attached.

- Informational Note No. 1 references ANSI Z535.2-2011 (R2017), Environmental and Facility Safety Signs, which offers guidance on the design and placement of signs and labels in various environments on electrical equipment.
- CMP (Code Making Panel)-1 added language in Section 110.21(B)(1) to address the durability of hazard marking labels and signs for electrical equipment installed in various environments.

What is its effect on industry.

The installer and the inspector will need to conduct an assessment to ensure that the marking will stay adhered to the electrical equipment. These requirements will ensure the safety of the electrical professional and keep important hazard labels and signs securely in place where they need to be installed.

Article 110.22

[A] Identification of Disconnecting Means

Summary of change:

The revision clarifies that identification of disconnecting means is not required when the location of the circuit source is evident.

CMP (Code Making Panel)-1 added text to clarify when the identification of a disconnecting means is required or not required.

What is its effect on industry.

This change will assist the installer and authority having jurisdiction (AHJ) in clarifying that identification of disconnecting means is not required when the location of the circuit source is evident. For example, the disconnecting means for a water heater or furnace installed close to an electrical panel enclosing the disconnecting means.

Article 110.26

Spaces about electrical equipment

Summary of change:

It has been observed that several installations violated the previous Code language involving this working space. Worker entrapment by equipment doors can cause serious injury or death. This change recognizes that open equipment doors may impede egress from electrical equipment when dangerous situations arise. It was determined that access and egress are impeded if an equipment door(s) is opened and restricts the working space access to less than 610 mm (24 in.) wide and 2.0 m (6 1/2 ft) high.

Substantiation was received by CMP (Code Making Panel)-1 concerning equipment doors and their interference with egress and access from working space. As a result, text was relocated from (A)(2)(b) in Section 110.26, as it concerns more than just working space width. Access to egress from working space requirements have been clarified in Section 110.26 for equipment 1000 volts, nominal, or less.

What is its effect on industry.

This change addresses a serious safety concern for electrical professionals and adds specific language to help reduce the risk of serious injury or death. These requirements must be installed correctly from the outset, and the AHJ will play a vital role in ensuring these requirements are adhered to in the field.

Article 110.26**[A][6] Grade, Floor, or Working Platform****Summary of change:**

Adding this language addresses floor conditions at electrical equipment locations. Previous editions of the Code did not address items such as the floor or platform being flat in the working space. These conditions are safety issues for workers performing tasks on electrical equipment. The AHJ needs guidance to ensure the initial installation is compliant. This change clarifies that the working clearance space must be kept clear, level, and as flat as practical for the entire required depth and width of the working space.

CMP (Code Making Panel)-1 added a new list item (6) at 110.26(A) to address the working space conditions of the floor at electrical equipment locations, emphasizing the need to be clear of objects and as level and flat as practical.

What is its effect on industry.

This change will assist installers and inspection authorities in applying the code requirements uniformly and avoiding issues at the time of inspection. When electrical professionals work on energized or non-energized electrical equipment, the floor condition should not add to safety concerns. This new requirement applies to the floor space that encompasses the required depth and width of the working space.

Article 110.29

In sight from (within Sight From, Within Sight)

Summary of change:

The term "in sight from" appears several times throughout the NEC. This information has been added to Article 110 as general requirements so it can be utilized throughout the NEC. This new section enhances the applicability and usability of the phrase used throughout the Code. It also addresses NEC Style Manual issues, which state that definitions shall not contain requirements or recommendations.

New Section 110.29 has been added by CMP (Code Making Panel)-1 to address electrical equipment and the term "in sight from."

What is its effect on industry.

Section 110.29 will help the electrical professional apply the phrase "in sight from" correctly when used with electrical equipment requirements. This distance is to be visible and not more than 15 m (50 ft) from the other equipment, consistent with the previous edition of the Code. Refer to the revised definition found in Article 100.

Article 110.33

[A] Entrance to enclosures and access to working space

Summary of change:

It was substantiated that access or egress is impeded by opened equipment doors in some situations. Conditions that restrict working space access or egress to less than 610 mm (24 in.) wide and 2.0 m (6 1/2 ft) high pose a safety concern for workers due to the risk of entrapment. Requirements for access and egress from working space for equipment over 1000 volts, nominal, have been revised and clarified in Section 110.33(A) by CMP (Code Making Panel)-1.

What is its effect on industry.

This change will assist electrical professionals in maintaining and inspecting electrical equipment safely, as mentioned in Section 90.1 of the NEC.

Article 110.34

[A] Workspace and guarding

Summary of change:

This change will clarify that the working clearance space shall be kept clear, level, and as flat as practical for the entire required depth and width of the working space, helping to ensure worker safety. Section 110.34(A) was revised by CMP (Code Making Panel)-1 to address the condition of the work surface, including the floor, grade, or platform area, within the working space of electrical equipment rated 1000 volts, nominal, and above.

What is its effect on industry.

This change will assist electrical professionals in applying the code requirements uniformly and avoiding issues at the time of inspection. This situation needs to be addressed by the installer and the authority having jurisdiction (AHJ) during installation and inspection to ensure safety throughout the life of the electrical installation.

Chapter 2

Wiring and protection

Articles 21-250

Article 210.2

Reconditioned equipment

Summary of change:

The text concerning reconditioned equipment has been reviewed and modified to remove redundant language in accordance with NEC Style Manual, Section 4.1.1. The NEC Correlating Committee recommended that CMP (Code Making Panel)-2 move reconditioned equipment information to a standardized placeholder within the various articles mentioning this topic to improve the usability of the Code. The information concerning reconditioned equipment has been relocated by CMP (Code Making Panel)-2 from 210.15 to 210.2 as it applies to branch circuits. (Note: the xxx.2 sections within various chapters will become placeholders for information concerning reconditioned equipment.)

What is its effect on industry.

The removal of redundant text and the creation of a standard location within various articles (xxx.2) for information about reconditioned equipment will make the NEC more user-friendly.

Article 210.8

[A][6] Dwelling units-kitchen

Summary of change:

There have been 104 electrocutions from 2011 to 2022 based on the Consumer Product Safety Commission (CPSC) database. Eighty-one percent of these incidents involved working on an appliance or other equipment. GFCI protection should be installed to protect individuals working with cord-and-plug appliances or equipment. The proximity of the appliance to water isn't the only source of electrical danger. Most appliances and equipment contain a power supply and some sort of grounded frame. This combination allows for the possible completion of a current route, posing an electrical risk to the user.

Ground-fault circuit-interrupter (GFCI) protection has been expanded in Section 210.8(A)(6) to include any cord-and-plug equipment in the kitchen, regardless of whether the outlet serves the countertop.

What is its effect on industry.

The electrical professional will need to be aware that GFCI protection is now required for all 125-volt through 250-volt receptacles within the kitchen, not just those serving countertop locations.

Article 210.8**[A] Dwelling unit bathroom- exception No. 4 Exhaust fan receptable(s)****Summary of change:**

There was confusion about whether a receptacle within an exhaust fan installed in the bathroom required GFCI protection. It was determined that these receptacles do not require GFCI protection unless specified by the installation instructions or the listing. There is language specifying that these receptacles are not readily accessible and must be installed as an integral part of the bathroom exhaust fan assembly. A new exception was added by CMP (Code Making Panel)-2 to Section 210.8(A) to help installers and enforcers understand ground-fault circuit-interrupter (GFCI) protection requirements for factory-installed exhaust fan receptacles.

What is its effect on industry.

This exception should alleviate disagreements between installers and inspectors regarding the need for GFCI protection for exhaust fan assemblies found in bathrooms within dwelling units.

Article 210.8**[A] Exception 3 and 210.8 [B] GFCI protection for personnel****Summary of change:**

The WSCR has a new definition in Article 100, and the WSAF had its term and definition modified with the acronym added. Similar nomenclature changes were made in 314.27 and 422.18. The relocation of the exceptions to the end of each section brings this into compliance with the NEC Style Manual. The exception text was revised to apply the new defined terms "Weight Supporting Ceiling Receptacle (WSCR)" and "Weight Supporting Attachment Fitting (WSAF)," including the acronyms. CMP (Code Making Panel)-2 utilized these new terms and acronyms for consistency throughout the code. Additionally, 210.8(A) Exception 3 and 210.8(B) Exception 6, along

with others, were relocated to the end of 210.8(A) and 210.8(B) as part of the reorganization of 210.8.

What is its effect on industry.

The weight supporting ceiling receptacle, previously known as the “listed locking support and mounting receptacle” with associated “attachment fitting,” has been in the NEC since the 2017 cycle and is available to installers. These changes introduce a more straightforward term, along with the acronym, which should make it easier for electrical professionals to use and understand within the electrical industry.

Article 210.8

[B][4] Other than dwelling units

Summary of change:

The buffet serving area typically contains various food wells that hold hot water. Customers or staff members touching the stainless steel are at risk of electric shock in the event of an accident. It was demonstrated that these locations have similar safety concerns to surfaces located in kitchens. Due to the identified risk associated with these buffet serving units, CMP (Code Making Panel)-2 has added GFCI protection.

CMP (Code Making Panel)-2 added buffet serving areas to the list of locations requiring ground-fault circuit-interrupter (GFCI) protection in Section 210.8(B)(4).

What is its effect on industry.

The electrical professional will need to ensure that any 125-volt through 250-volt receptacle supplied by a single-phase branch circuit and 150 volts or less to ground and 50 amperes or less is provided with GFCI protection. This addition also applies to any receptacle supplied by three-phase branch circuits of 150 volts or less to ground and 100 amperes or less. This

requirement will provide protection from potential shock hazards at these locations.

Article 210.8

[B][7] GFCI protection for personnel

Summary of Change

Substantiation indicated that the electrical hazard was due to the appliance being closer to the sink rather than the location of the receptacle. Fixed or stationary appliances, such as refrigerators or ranges, are typically constructed of metal and can be located within 6 feet of a sink. A person at the sink who makes contact with these metal appliances has been injured or killed as a result. This action was necessary to prevent needless electrocutions or shocks to people.

CMP (Code Making Panel)-2 added "cord-and-plug-connected fixed and stationary appliances" to the existing language for sink locations.

What is its effect on industry.

This change will require the electrical professional to provide GFCI protection for fixed or stationary appliances that are within 6 feet of the top inside edge of the bowl of a sink. Previously, this measurement was taken from the top inside edge of the bowl of a sink to the receptacle to determine if GFCI protection was necessary. The electrical professional will need cooperation from the builder to determine where fixed or stationary appliances will be located around sinks.

Article 210.8

[B][13] Aquariums and Bait wells

Summary of Change

The areas around bait wells, aquariums, and similar locations tend to be wet conductive environments where various types of electrical equipment, such as aerators, luminaires, and pump motors, are used. GFCI protection of the receptacles from which this equipment is connected will provide a level of protection to those who may come in contact with the open aquatic vessels from electrical currents that may be induced on the conductive portions of the vessel or nearby conductive surfaces.

Section 210.8(B) added a new numbered list item (13) dealing with aquariums and bait wells in areas other than dwelling units. This change requires that receptacles installed within 1.8 m (6 ft.) of aquariums, bait wells, and similar open aquatic vessels or containers be provided with ground-fault circuit-interrupter (GFCI) protection.

What is its effect on industry.

The electrical professional will need to provide GFCI protection for these locations as a significant shock and electrocution hazard may exist.

Article 210.8

[D] Dwelling units – specific appliances

Summary of Change

It was determined that users of the Code appreciate list items more than long-running sentences of text. Section 210.8(D) will also include five new appliances. These additional appliances can be hard-wired to outlets and would not meet the requirements to be GFCI protected. A shock hazard can exist with hard-wired equipment as well as cord-and-plug connected equipment.

The appliance information in 210.8(D) requiring ground-fault circuit-interrupter (GFCI) protection was placed into a list format by CMP (Code

Making Panel)-2 for easier use. In the 2020 NEC, 210.8(D) did not include any specific appliances but provided prescriptive requirements for achieving GFCI for appliances listed in a reference to 422.5.

What is its effect on industry.

Users of the Code will find that appliances now appear in a list format. New appliances on the list that require ground-fault circuit-interrupter (GFCI) protection include electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and microwave ovens. This requirement applies to a branch circuit or outlet supplied by 150 volts or less to ground and 60 amperes or less in a single-phase or three-phase system.

Article 210.8

[F] Outdoor Outlets

Summary of Change

This change addresses the issue of older existing outlets that are not GFCI protected when new or replacement equipment is provided. This change will increase the overall level of safety by providing the same level of protection as a new outlet. A new requirement has been added to 210.8(F) by CMP (Code Making Panel)-2, stating that when equipment supplied by an outlet covered under the requirements of this section is replaced, the outlet shall be GFCI protected.

What is its effect on industry.

Designers and installers should be prepared to provide the same level of GFCI protection for equipment installed in the areas specified in Section 210.8(F), regardless of whether the outlet is new or existing.

Article 210.11**[C][4] Garage Branch Circuits****Summary of Change**

Often, equipment such as a central vacuum unit or garage door opener is allowed to be supplied by a branch circuit that limits ampacity to 15 amperes. Additionally, receptacles installed to supply equipment that may be adequately served by a 15-ampere branch circuit are now clearly permitted to do so. If a 15-ampere branch circuit is installed, it would be in addition to the 20-ampere circuit supplying the required garage receptacles and, as such, would not diminish the required 20-ampere circuit capacity.

The text was revised in Section 210.11(C)(4) by CMP (Code Making Panel)-2, clarifying that 15-ampere branch circuits are permitted to serve receptacle outlets installed in a dwelling unit garage that are in addition to the receptacle outlets required by 210.52(G)(1).

What is its effect on industry.

The previous edition of the NEC may have led users to incorrectly deduce that all garage receptacles, even those not required by 210.52(G)(1), must be on a 20-ampere rated branch circuit. This clarification will help all electrical professionals have a greater understanding of the requirements for receptacle outlets in garages, allowing for 15-ampere branch circuits to serve additional outlets without affecting the mandatory 20-ampere circuit capacity.

Article 210.11

[C][4] Garage Branch Circuits, exception #2

Summary of Change

A single-bay garage is only mandated to be provided with one receptacle outlet on the 20-ampere branch circuit. This will provide adequate circuit capacity to supply other loads that are likely to be limited in number due to the reduced space availability in the garage. A new exception (4) was added by CMP (Code Making Panel)-2 to Section 210.11(C)(4), permitting the 20-ampere circuit supplying a single-vehicle bay garage to supply other equipment in accordance with the requirements in 210.23(A)(1) and (A)(2).

What is its effect on industry.

By utilizing Exception No. 2, the electrical professional can use a single 20-ampere branch circuit to supply a single-car attached garage, rather than installing additional circuits for other equipment within the single-car garage area. This provides a more efficient and practical approach to meeting electrical requirements in a smaller garage space.

Article 210.12

Arc-Fault circuit- interrupter protection

Summary of Change

This revision aims to provide users of the Code with an easier way to locate important references related to AFCI requirements. The addition of the 10-ampere branch circuit expands the allowable sizes for these locations. Additionally, the subdivisions have been renamed for clarity:

- **Subdivision (A):** Means of Protection now lists the available protection methods.
- **Subdivision (B):** Dwelling Units contains a list of locations where 120-volt, single-phase, 10, 15, and 20-ampere branch circuit outlets or devices must have AFCI protection.

- **Subdivision (C):** Dormitory Units contains a list of locations where 120-volt, single-phase, 10, 15, and 20-ampere branch circuit outlets or devices must have AFCI protection.
- **Subdivision (D):** Other Occupancies contains a list of locations where 120-volt, single-phase, 10, 15, and 20-ampere branch circuit outlets or devices must have AFCI protection.
- **Subdivision (E):** Branch Circuit Wiring Extensions, Modifications, or Replacements.

CMP (Code Making Panel)-2 reformatted this section to make it easier to reference and apply the requirements and introduced 10-ampere branch circuits as an allowable branch circuit size.

What is its effect on industry.

The reformatting of this section will greatly assist electrical professionals in locating various requirements related to AFCI protection and the specific locations where this protection must be installed. Additionally, the option to use a 10-ampere branch circuit, based on specific requirements, provides electrical professionals with added flexibility.

Article 210.12

[D][3] AFCI, Other Occupancies

Summary of Change

These areas in the described rooms are used similarly to bedrooms in dwellings or guest rooms in hotels and motels and should receive the same level of safety that AFCI protection provides. Therefore, all 120-volt single-phase, 10, 15, and 20-ampere branch circuits supplying devices or outlets in these rooms are now required to have AFCI protection.

CMP (Code Making Panel)-2 received substantiation to include rooms designed exclusively as sleeping areas in places such as firehouses, rescue squads, police departments, and similar locations to be protected by one of the methods in 210.12(A)(1) through (A)(6). Consequently, a new list item (3) was added to Section 210.12(D).

What is its effect on industry.

This new requirement will ensure that AFCI protection is incorporated into the building design of firehouses, rescue squads, police departments, and similar locations with rooms used exclusively as sleeping areas.

Article 210.17**Guest room and guest suite****Summary of Change**

Assisted living facilities were considered to have the same characteristics as guest rooms and guest suites. Consequently, they should follow the same branch circuit requirements as dwelling units. The locations previously mentioned in this section were organized into a list format for better clarity. Additionally, informational notes were included to provide guidance on laundry branch circuits and to refer to the Life Safety Code for the definition of an assisted living facility.

[Section 210.17](#) was modified by CMP (Code Making Panel)-2 to include assisted living facilities to the list of existing locations (guest rooms and guest suites) that were provided with a permanent means for cooking requiring them to have their branch circuits installed per the requirements for dwelling units.

What is its effect on industry.

Electrical professionals need to be aware of these requirements when performing electrical work in assisted living facilities. The list format will make this section more user-friendly, helping to clearly identify the applicable locations.

Article 210.19

Conductors- Minimum ampacity and size

Summary of Change

There was confusion in the field regarding whether the voltage limitation applied to the circuit or the insulation rating of the conductor. This has been clarified by the code-making panel.

- Additionally, with the creation of new Article 235, language was added to Section 210.19 to state that this section applies to circuits of no more than 1000 volts AC or 1500 volts DC. Article 235 is intended for voltages exceeding 1000 volts AC and 1500 volts DC.

CMP (Code Making Panel)-2 clarified that the voltage limitation should apply to the circuit, not the conductor insulation rating, and specified that Section 210.19 applies to branch circuits not exceeding 1000 volts AC or 1500 volts DC.

What is its effect on industry.

There was confusion in the field regarding whether the voltage limitation applied to the circuit or the insulation rating of the conductor. This has been clarified by the code-making panel.

- Additionally, with the creation of new Article 235, language was added to Section 210.19 to state that this section applies to circuits of no more than 1000 volts AC or 1500 volts DC. Article 235 will address requirements for voltages exceeding 1000 volts AC and 1500 volts DC.

Article 210.23

Permissible Loads, Multiple-Outlet Branch Circuits 10 Ampere Branch Circuits-Permitted

Summary of Change

Guidance was necessary to ensure users of the Code understand how to install a 10-ampere branch circuit if they choose to do so. A 10-ampere load can supply lighting outlets, lighting circuits for bathroom and laundry area

exhaust fans within dwelling units, and a gas fireplace unit served by an individual branch circuit. However, a 10-ampere branch circuit cannot supply receptacle outlets, fixed appliances (except as permitted for individual branch circuits), garage door openers, or laundry equipment.

CMP (Code Making Panel)-2 has developed and implemented information regarding the permitted and non-permitted use of a 10-ampere branch circuit into the existing Section 210.23.

What is its effect on industry.

For instances when the installer installs or the AHJ inspects an installation involving a 10-ampere branch circuit, the information provided will ensure a compliant installation. The installation of a 10-ampere branch circuit is optional. If you choose to install a 10-ampere branch circuit, follow the permitted and non-permitted use guidelines set forth by the NEC.

Article 210.52

[C] Island and peninsular countertops and work surfaces

Summary of Change

Data compiled by the Consumer Products Safety Commission (CPSC) indicates 45 reports of burns or other injuries between January 1991 and 2020. An estimated 9,700 burns or other injuries were treated in U.S. hospital emergency rooms during this period. These injuries were caused by children pulling the cords of countertop cooking appliances, spilling hot contents onto themselves. The incidents resulted in second- and third-degree burns, with 10 cases leading to death. Investigations revealed that both children and adults might pull power cords, or the cords could get snagged inadvertently when someone walks by. In one tragic case, a wheelchair-bound individual died after hot contents were pulled onto their lap.

CMP (Code Making Panel)-2 has made the requirement for receptacles serving the countertop or work surface of an island or peninsula optional in Section 210.52(C). However, guidance for their location has been maintained for instances when they are provided.

What is its effect on industry.

The installation of a receptacle outlet for island or peninsula locations is now optional. Receptacle outlets are no longer permitted to be placed on the side of an island or peninsula. If a receptacle is desired, it must be installed in or on the countertop or work surface. This decision will be made by the builder, homeowner, and/or electrical contractor. A city ordinance or amendment might also modify these NEC requirements.

- If a receptacle outlet is not provided for the island or peninsula countertop or work surface, the electrical contractor must ensure there is a provision for the future addition of a receptacle outlet. This could involve installing a raceway to the island or peninsula location or leaving a wiring method (such as NM cable in a box with a cover) in an accessible location.

Article 210.52

[G] Basements, Garages, and Accessory Buildings

Summary of Change

Reports have been received about disagreements between installers and inspectors regarding whether the receptacle for a premises security system could serve as the required receptacle mandated by 210.52(G). The change is being made to ensure that the required receptacles for the basement, garage, or accessory building are provided with ground-fault circuit-interrupter (GFCI) protection. Disagreements have arisen in the field concerning a receptacle that serves the premises security system, which is not required to have GFCI protection, yet is also intended to meet the receptacle outlet requirement specified in 210.52(G).

CMP (Code Making Panel)-2 members clarified that the receptacle provided for premises security systems does not meet the receptacle requirements of 210.52(G).

What is its effect on industry.

This change should resolve any misunderstandings between installers and the authority having jurisdiction (AHJ) regarding the requirements for a GFCI receptacle outlet in the specified locations that might also contain a premises security system.

Article 210.70**Lighting outlets required****Summary of Change**

A laundry area deserves to be illuminated by a luminaire controlled by a wall-mounted control device located near the entrance to the room. Occupants typically need to carry clothing or other items in this area. A wall-mounted control device controlling a receptacle can be installed instead of a lighting outlet. This requirement only applies to laundry areas in dwelling unit locations.

CMP (Code Making Panel)-2 added laundry areas to the existing list of locations in 210.70(1), requiring a listed wall-mounted control device to be installed for the lighting outlet. Additionally, language was included to prohibit a switch or wall-mounted control device from relying solely on a battery unless it includes a means to energize the lighting outlets upon battery failure.

What is its effect on industry.

It is uncertain what impact this change will have on the electrical industry, as many installers already install a wall-mounted switch at the entrance of the laundry area to control the luminaire. By adding the laundry area to the existing list of locations (every habitable room, kitchen, and bathroom), the Code now specifically requires this to be done.

Article 215.15

Barriers (Feeder)

Summary of Change

The change is similar to the barrier requirements found in Section 230.62(C) of the 2020 NEC. The concern was that when feeder taps or transformer secondary wiring feed a panelboard, for example, the line terminal lugs to the main breaker of such panelboards would remain energized even when the main breaker is turned off. This new requirement enhances safety by mandating covers or barriers over the line terminals to the main breaker.

Substantiation was provided to CMP (Code Making Panel)-10 that whenever feeder taps or transformer secondary conductors supply panelboards, switchboards, switchgear, or motor control centers, additional barriers must be installed at load terminations if these terminations remain energized when the disconnect for the taps (or transformer secondary conductors) is in the off (open) position. Consequently, a new Section 215.15 was added to address this requirement.

What is its effect on Industry

The new barrier requirements will provide additional safety for electrical workers. The barriers used for services have proven to be an easy and inexpensive fix, and there is potential to expand such requirements to include all disconnects and panelboards in future code cycles.

Articles 215.18, 225.42, 230.67

Surge Protection

Summary of Change

Voltage surges can damage important sensitive equipment, such as smoke alarms, AFCIs, and GFCIs. These devices are particularly crucial in areas where people sleep. The new rules have been expanded to ensure that surge

protective devices (SPDs) are required not just for services but also for feeders supplying certain occupancies or areas used for sleeping.

The requirements of 230.67 in the 2020 NEC have been expanded for the 2023 NEC to include two new sections: 215.18 and 225.42. The new language mandates the use of Type 1 or 2 SPDs when a service or feeder supplies a dwelling unit, dormitory unit, guest rooms of hotels and motels, and sleeping rooms or areas of nursing homes and limited care facilities. Additionally, the new requirements specify that SPDs must have a nominal discharge rating of not less than 10kA.

What is its effect on Industry

There will be added costs for installing the SPDs, particularly for dormitory units, guest rooms of hotels and motels, and sleeping rooms or areas of nursing homes and limited care facilities. However, the safety of these electrical systems will be improved, thereby enhancing public safety.

Article 220.1

Scope (Branch- Circuit, Feeder, and Service load Calculations)

Summary of Change

The correlating committee requested CMP (Code Making Panel)-2 to modify the existing scope language to reflect the two new parts that had been added to Article 220. Additionally, an existing figure informational note 220.1 needed to be revised.

CMP (Code Making Panel)-2 added information about new Parts VI and VII to the scope of Article 220, which concern calculation methods for health care facilities and marinas, boatyards, floating buildings, and commercial and noncommercial docking facilities. Additionally, there are new requirements in Section 220.110 that provide relief for load calculations in health care facilities.

What is its effect on Industry

Periodically, there is a need to create new parts for NEC articles. This change alerts electrical professionals about the calculation locations for health care facilities (Part VI) and marinas, boatyards, floating buildings, and commercial and noncommercial docking facilities (Part VII).

Article 220.5

[C] Floor Areas

Summary of Change

Previous text included language that may be considered subjective, such as "not adaptable for future use." Additionally, garages and other spaces, previously exempted from the square foot calculation, are often used as ancillary space to the habitable portions of the dwelling and, as such, should be included in the square foot calculation for the dwelling, building, or other space.

Substantiation was provided to CMP (Code Making Panel)-2 for consideration, leading to the decision that areas such as garages and unused or unfinished spaces are no longer excluded from the calculated floor area of the building, dwelling unit, or other areas. Consequently, a new subdivision (C) was added to Section 220.5(C), Floor Areas.

What is its effect on Industry

Electrical professionals need to be aware that this change will increase the calculated load for dwelling units, buildings, and other spaces that rely on square foot calculations when determining the load.

Article 220.57

Electrical Vehicle Supply Equipment (EVSE) Load

Summary of Change

Electric Vehicle Supply Equipment (EVSE) is becoming increasingly prevalent, necessitating charging infrastructure and corresponding load calculation requirements in the NEC. A 7200 volt-ampere (VA) minimum requirement was chosen, based on a 30-ampere, 240-volt, single-phase circuit. This language specifies the use of 7200 volt-amperes or the VA rating from the nameplate of the equipment, whichever is larger.

CMP (Code Making Panel)-2 added a new [Section 220.57](#) to specify load calculations for Electric Vehicle Supply Equipment (EVSE).

What is its effect on Industry

Guidance was needed for electrical professionals regarding the minimum volt-ampere requirements for EVSE. Oversizing these requirements can be costly and burdensome for installers. This new section provides users of the Code with the necessary information to install and inspect this equipment efficiently and accurately.

Article 220.70

Energy management Systems (EMSs)

Summary of Change

This new section resulted from a correlating committee task group focused on alternative energy requirements. The change builds upon specific allowances, providing a new option for any load connected to a feeder or service conductor where these loads are controlled to a maximum limit that effectively restricts the total loads operated at one time. If an Energy Management System (EMS) is used in accordance with 750.30, requirements are provided concerning the maximum value setpoint.

- Providing this option allows electric distribution systems to be utilized in a safe and effective manner. It will help property owners pursue the

use of EMS equipment without requiring extensive electrical system upgrades.

CMP (Code Making Panel)-2 added a new Section 220.70 to specify load calculations for Energy Management Systems (EMSs).

What is its effect on Industry

Energy management systems are becoming increasingly popular. Some university apartments utilize these systems to monitor and manage the electricity usage of occupants. For example, in a four-bedroom apartment, each occupant may have a set predetermined amount of electricity they can use. If a tenant exceeds their predetermined monthly usage amount, they receive a bill for the additional usage. Electrical professionals need to be familiar with these systems and understand the specific requirements for their installation.

Article 220.110

Receptacle loads receptacle loads

Summary of Change

The Correlating Committee (CC) and the Standards Council determined that CMP (Code Making Panel)-2 has responsibility for occupancy-based load calculations and demand factors. The Demand Factor Task Group, consisting of CMP (Code Making Panel)-2 and CMP (Code Making Panel)-15 members, was assembled to resolve correlation issues and review data provided by the NFPA Research Foundation project. The focus was on the large number of receptacles required in Category 1 and Category 2 patient care spaces. New tables were developed, which included demand factor values for receptacles used in health care facilities. (Note: CC assigned oversight of this requirement to CMP (Code Making Panel)-15 at the Second Draft CC Meeting.)

CMP (Code Making Panel)-2 members recommended new tables with demand factor values for receptacles used in Category 1, 2, 3, and 4 patient care spaces within health care facilities. As a result, Table 220.110(1) and Table 220.110(2) are now included in the 2023 NEC.

What is its effect on Industry

New Table 220.110(1) and Table 220.110(2) provide electrical professionals with demand factor information for receptacles supplied by general-purpose branch circuits in Category 1, 2, 3, and 4 patient care spaces.

Article 220.12

Marinas, boatyards, floating buildings, and commercial and noncommercial docking facilities

Summary of Change

The Correlating Committee and the Standards Council determined that CMP (Code Making Panel)-2 has responsibility for load calculations, as it is the logical place for users of the Code to find information regarding these calculations. (Note: The CC assigned responsibility for Part VII to CMP (Code Making Panel)-7 during the Second Draft Correlating Committee.)

The requirements of Section 555.6 have been moved to 220.120. This relocation does not change the requirements for load calculations or demand factors; it is simply a reorganization.

What is its effect on Industry

This change aims to simplify the use of the NEC by placing load calculation and demand factor requirements for marinas, boatyards, floating buildings, and commercial and noncommercial docking facilities in the article that contains this information. Code users need to be aware that this information has been relocated for the 2023 code cycle.

Article 225.5 and 225.7

Deletion of Sections

Summary of Change

Section 225.5 was redundant because its requirements are already covered in Articles 215 and 220. Similarly, Section 225.7 was redundant since its requirements are addressed in Articles 210 and 220.

Sections 225.5, Size of Conductors 1000 Volts, Nominal, or Less, and 225.7, Lighting Equipment Installed Outdoors, were deleted.

What is its effect on Industry

There will likely be little or no effect on the electrical industry, as these requirements remain part of the NEC but are now located in other sections.

Article 225.41

Emergency Disconnects

Summary of Change

This change expands upon 230.85, which in the 2020 NEC only included services for one- and two-family dwelling units. It was recognized that one- and two-family dwelling units are not always fed directly by a service but sometimes by an outdoor feeder. The requirement was added to ensure that all new one- and two-family dwelling units are provided with an emergency disconnect located at a readily accessible outdoor location. The emergency disconnect must be marked as "EMERGENCY DISCONNECT." Additionally, a plaque or directory must be provided adjacent to the emergency disconnect, identifying the location(s) of any other energy source disconnects on the premises.

CMP (Code Making Panel)-10 added the new section to require an emergency disconnect at a readily accessible outdoor location for one- and

two-family dwelling units that are served by feeders. The disconnect must be on or within sight of the dwelling unit.

What is its effect on Industry

Section 225.41 will help increase the safety of an electrical system by providing first responders (and others) easy access to shut down the electrical system (and other sources of power on the premises) for a one- and two-family dwelling.

Article 230.62

[C] Barriers

Summary of Change

New language was added by CMP (Code Making Panel)-10 to clarify that barriers are required in service equipment to ensure that no uninsulated, ungrounded busbars or terminals are exposed to inadvertent contact while load terminations are being serviced when the service disconnect is in the open position.

The clarification emphasizes that the main point of the barrier requirement is to have de-energized busbars or terminals while load terminations are being serviced.

What is its effect on Industry

This change adds clarity on when the barriers are required. The barriers significantly increase safety for electrical professionals working on service equipment.

Article 230.67

[A] Surge- protective devices

Summary of Change

Service equipment can sometimes be subjected to surges that inflict damage on systems designed to provide life safety. Recognized industry authorities such as NEMA, IEEE, and UL have collected data showing that surges cause significant damage. Insurance organizations are recognizing the need for surge protection to limit claims for damage to sensitive electronic devices. Electronic life-saving equipment, such as fire alarm systems, GFCIs, AFCIs, and smoke alarms, could be rendered inoperable when a surge occurs, and many times this damage goes undetected by the owner.

- Prior to the 2023 NEC, surge protection was only required for dwelling units. Additional occupancies have now been added, including dormitory units, guest rooms and guest suites of hotels and motels, and areas of nursing homes and limited-care facilities used exclusively as patient sleeping rooms.

CMP (Code Making Panel)-10 revised subdivision 230.67(A) by changing the term "dwelling units" to the following occupancies and adding a list of additional locations that now require protection by a surge-protective device (SPD):

- Dormitory units
- Guest rooms and guest suites of hotels and motels
- Areas of nursing homes and limited-care facilities used exclusively as patient sleeping rooms

What is its effect on Industry

Electrical professionals need to be aware of the new occupancies requiring surge protection. The installer and inspector (AHJ) are key elements in ensuring this protection is installed correctly. These new requirements for surge protection will help protect both life and property.

Article 230.71

[B] Two to six service disconnecting means

Summary of Change

The additions of 230.71(B)(4) and (6) increase the ease of usability for the Code by including these requirements in the existing list items. They also ensure that transfer switches are properly listed when used as service equipment. Barrier provisions were added for additional types of service equipment to improve safety by reducing the likelihood of a person or maintenance equipment coming into contact with energized parts while servicing load terminations.

CMP (Code Making Panel)-10 added transfer switches at 230.71(B)(4) to clarify that they must be listed for and used as service equipment. Each service disconnect must be provided in a separate compartment.

- Section 230.71(B)(6) was added for motor control centers used as service equipment, limiting such equipment to a maximum of two service disconnects per single motor control center, with barriers required between each unit or compartment containing a service disconnect.

What is its effect on Industry

These changes will enhance safety for electrical professionals servicing load terminations in various types of service equipment, not just in traditionally used service equipment.

Article 230.71

[B] Exception two to six service disconnecting means

Summary of Change

Several public inputs expressed concern that if someone wanted to add a disconnect to existing service equipment that allowed more than one disconnect, the requirements of 230.71(B) could be interpreted to mean that the entire service equipment would need to be replaced. The new exception clarifies that existing service equipment, if compliant with previous editions of the NEC, is not required to be upgraded.

An exception was added by CMP (Code Making Panel)-10 to clarify that existing service equipment is not required to comply with the provisions of 230.71(B) when such existing equipment was installed in compliance with previous editions of the NEC that allowed for up to six service disconnects in a single enclosure or compartment.

What is its effect on Industry

The added exception will help prevent misinterpretations within the electrical professional community regarding when existing service equipment is required to be upgraded.

Article 230.85

Emergency Disconnects

Summary of Change

Additional provisions were added for clarity to help NEC users better understand the requirements regarding emergency disconnects for one- and two-family dwelling units. These include:

- Requirements clarifying that meter disconnects integral to meter mounting equipment or other listed disconnects used as the emergency disconnect cannot be marked as "suitable ONLY for use as service equipment." This requirement does not apply to the regular

service disconnect(s) for one- and two-family dwellings (see 230.85(B)).

- Section 230.85(C) was added to clarify that all of 230.85 applies to new (or replaced) service equipment. However, an exception was added to clarify that when only meter sockets, service conductors, service raceways, and/or fittings are replaced, 230.85 does not apply.
- Section 230.85(D) specifies that a plaque or directory must be provided adjacent to the emergency disconnect, identifying the location(s) of any other energy source disconnects on the premises.

[Section 230.85](#) was reorganized by CMP (Code Making Panel)-10 into subdivisions with titles to better align with the formatting requirements of the *NEC Style Manual*.

What is its effect on Industry

The provisions of 230.85 for emergency disconnects will be better understood by electrical professionals due to the clarifications and reorganization of the requirements. The emergency disconnect(s) will help increase the safety of an electrical system by providing first responders (and others) easy access to shut down the electrical system (and other sources of power on the premises) for one- and two-family dwellings.

The provisions of 230.85 for emergency disconnects will:

- Improve clarity and ensure compliance with emergency disconnect requirements.
- Prevent confusion about marking requirements for emergency disconnects.
- Ensure that the emergency disconnect and additional energy source disconnects are properly identified.
- Simplify the upgrade process by specifying when 230.85 does and does not apply, reducing unnecessary replacements.

Article 235

Branch Circuits, Feeders and Services Over 1000 Volts ac, 1500 Volts dc, Nominal

Summary of Change

A new Article 235 has been designated to consolidate information regarding medium voltage branch circuits, which was previously scattered throughout the NEC. This article also encompasses requirements for feeders and services, organized into individual sections.

- Relevant information from Article 210 has been transferred to this new article. The requirements from Article 210 were carefully reviewed to ensure they apply to medium voltage branch circuits. Adjustments were made as needed, without altering the technical content or existing standards.

CMP (Code Making Panel)-2 introduced a new Article 235 to regulate medium voltage branch circuits.

What is its effect on Industry

Article 235 provides users of the NEC with a centralized location for finding requirements for branch circuits over 1000 volts AC and 1500 volts DC, commonly referred to as medium voltage branch circuits. This consolidation is designed to enhance the usability of the NEC, particularly for those who focus on these specific voltage levels. This change should make it easier for professionals to locate the necessary information quickly and efficiently.

Article 240.2

Reconditioned equipment

Summary of Change

To comply with Correlating Committee recommendations and enhance usability for NEC users, the reconditioning requirements of Article 240 have

been consolidated into a single section, 240.2. The xxx.02 sections are becoming the standard placeholders for reconditioned equipment requirements.

- Restrictions on using any reconditioned GFPE or GFCI devices have been added, as their reconditioning is not dependent on the installation location. When these devices reach the end of their usable lifespan, a new and listed device should be installed in their place.

CMP (Code Making Panel)-10 relocated the reconditioning requirements from sections 240.62 and 240.88 to Section 240.2 in the 2023 NEC. Additionally, ground-fault protection of equipment (GFPE) and ground-fault circuit interrupters (GFCI) were added to the list of equipment that must not be reconditioned.

What is its effect on Industry

These changes enhance the usability of the NEC and increase the safety of electrical systems by ensuring that when existing GFPE or GFCIs are replaced, they are replaced with new, listed equipment.

Article 240.4

[B] Overcurrent devices rated 800 Amperes or less

Summary of Change

Adjustable trip overcurrent devices are becoming more widely used across the country. The new provisions acknowledge these devices and allow for their adjustment according to 240.4(B). Nonetheless, the requirements outlined in 240.4(B)(1), (B)(2), and (B)(3) must still be followed, and the adjustable trip overcurrent protective device must have restricted access as specified in 240.6(C).

CMP (Code Making Panel)-10 has approved the use of adjustable trip overcurrent protective devices, allowing them to be set at an ampacity value that does not exceed the next higher standard overcurrent protection device ampacity value, as specified in Table 240.6(A), above the ampacity of the conductors being protected.

What is its effect on Industry

This change provides greater flexibility for designers and electrical professionals in selecting overcurrent protection devices for electrical systems.

Article 240.4

[D][3] 14 AWG Copper-Clad Aluminum

Summary of Change

14 AWG copper-clad aluminum was included to align with other small conductors permitted per 240.4(D). The overcurrent protection device rating for these conductors must not exceed 10 amperes, and the maximum continuous load on the circuit cannot exceed 8 amperes. Furthermore, any branch-circuit-rated breakers or fuses connected to these conductors must be listed and marked for use with such conductors.

CMP (Code Making Panel)-10 added 14 AWG copper-clad aluminum to the list of small conductors permitted under NEC 240.4(D).

What is its effect on Industry

This change will provide the electrical industry with greater flexibility when selecting types of conductors to install for specific circuits.

Article 240.6

Standard Ampere rating for fuses and inverse time circuit breakers

Summary of Change

10-ampere rated fuses and circuit breakers are available, and this change clarifies that these devices are permitted for use.

CMP (Code Making Panel)-10 added the 10-ampere rating to the list of standard ratings for overcurrent protection devices.

What is its effect on Industry

This change provides the electrical industry with more flexibility when selecting overcurrent protection devices for specific circuits.

Article 240.6

[D] Remotely Accessible Adjustable-Trip Circuit Breakers

Summary of Change

Due to the increased use of SMART devices, new provisions were needed to address cybersecurity. It is important to clarify that these requirements are related to safety, not privacy or data protection concerns. When the connection is through a networked interface, the circuit breaker and associated software must either be evaluated for cybersecurity or a cybersecurity assessment of the network must be completed. Documentation of this assessment must be provided to those authorized to inspect, operate, and maintain the system.

CMP (Code Making Panel)-10 added provisions to allow remote access to adjustable-trip circuit breakers through either a direct local non-networked interface or a networked interface connection.

What is its effect on Industry

The new requirements will enhance the protection of remotely accessible adjustable-trip circuit breakers from cyberattacks. The authority having jurisdiction (AHJ) should be prepared to request assessment documentation from the installer or designer, confirming that the network has been evaluated for cybersecurity.

Article 240.7

Listing Requirements

Summary of Change

This requirement was added to eliminate any confusion about whether such devices need to be listed and to provide jurisdictions with a tool to mandate the listing of equipment as a basis for approving these devices.

In the new Section 240.7, CMP (Code Making Panel)-10 clarified that branch-circuit overcurrent protective devices, relays, and circuit breakers that provide ground-fault protection of equipment (GFPE) and ground-fault circuit interrupter (GFCI) devices must be listed.

What is its effect on Industry

The change is expected to have little impact on the electrical industry, as such devices have long been required to be listed, despite the NEC not previously specifying this requirement.

Article 240.11

Selective Coordination

Summary of Change

The rule was introduced to eliminate any loopholes or gaps in the code, ensuring that all feeder overcurrent devices are included in selective coordination calculations whenever the NEC mandates selective coordination. Previously, the NEC could be interpreted to mean that only certain feeder overcurrent protective devices needed to be part of the coordination study. However, for proper selectivity, all feeder overcurrent protective devices fed by the same service overcurrent protective device must be included.

CMP (Code Making Panel)-10 added a requirement to clarify that whenever the NEC mandates a feeder overcurrent protective device to be selectively coordinated with a service overcurrent protective device, ALL feeder

overcurrent devices connected to that service must be selectively coordinated with the service overcurrent device.

What is its effect on Industry

This change will enhance the safety of electrical systems requiring selective coordination by ensuring that the service overcurrent protective device is less likely to open, as all feeder overcurrent protective devices are included in the coordination study. This will add clarity and improve the usability of the NEC for the electrical industry

Article 240.16

Interrupting Ratings

Summary of Change

The requirement for branch-circuit overcurrent protective devices to have a minimum interrupting rating of 5,000 amperes was previously included in the definition of "Overcurrent Protective Device (Branch-Circuit Overcurrent Protective Device)." However, according to Section 2.2.2.2 of the NEC Style Manual, definitions are not allowed to contain requirements or recommendations. Therefore, the 5,000-ampere interrupting rating requirement was moved from the definition to Section 240.16.

CMP (Code Making Panel)-10 added a new requirement at Section 240.16 to specify that the minimum interrupting rating of a branch-circuit overcurrent protective device is 5,000 amperes.

What is its effect on Industry

This change will not impact the type of overcurrent protective devices installed. By placing the requirement in a code section, users of the NEC will have easier access to this information.

Article 240.24

[A] Accessibility - Exception

Summary of Change

This revision addresses a couple of issues that have caused enforcement problems due to the term "similar enclosures." For example, a Type 4X stainless steel panel with bolted covers, designed with a series of bolts around the perimeter, is not considered an industrial control panel nor a "similar enclosure." The same logic applies to hazardous location enclosures.

- The exception clarifies that when it is applied, any readily accessible requirements that would normally apply to the overcurrent devices must still be applied to the enclosure itself. This includes any enclosed device(s) with the door or cover in the open position.

Substantiation was presented to CMP (Code Making Panel)-10 regarding access to overcurrent protective devices, highlighting the need to replace the term "similar enclosures" in the existing exception due to its vagueness and the enforcement challenges it posed. Consequently, the exception to Section 240.24(A) was updated.

What is its effect on Industry

This exception helps to clarify the requirement's intent and will aid in enforcement consistency. Electrical professionals will benefit from more specific language, making it less confusing to apply to electrical installations.

Article 240.24

[E] Overcurrent Protective Devices in Bathrooms

Summary of Change

The revision addresses the difficulty of accessing a bathroom when it is occupied. Panel members believed there was no practical reason to continue allowing overcurrent protective devices in certain occupancies. Additionally, overcurrent protective devices are no longer permitted in showering facilities or locker rooms with showering facilities, as these areas present similar hazards to those found in bathrooms.

Substantiation was received by CMP (Code Making Panel)-10, and the panel determined that overcurrent protective devices (other than supplementary overcurrent devices) are no longer allowed in any bathroom, showering facilities, or locker rooms with showering facilities.

What is its effect on Industry

The electrical industry will need to find alternative locations for overcurrent protective devices. This change will likely have the greatest impact on facilities or occupancies with limited square footage. Office buildings, in particular, are common occupancies where panels were previously installed in bathrooms

Article 242.2

Reconditioned equipment

Summary of Change

Surge Protective Devices (SPDs) are not dependent on the specific equipment they connect to. When they reach the end of their usable lifespan, a new and listed SPD should be installed in their place.

CMP (Code Making Panel)-10 has specified in the new Section 242.2 that surge protective devices (SPDs) and surge arresters shall not be reconditioned.

What is its effect on Industry

This requirement will help ensure that when existing SPDs or surge arresters are replaced, they are replaced with new and listed equipment. This will enhance the safety of the electrical system.

Article 242.9

SPD Indicating

Summary of Change

The rule was added to enable building occupants, electricians, and authorities having jurisdiction to identify whether an SPD is functioning properly or if it needs to be replaced.

The new Section 242.9 requires surge protective devices (SPDs) to have an indicator showing that the device is functioning properly.

What is its effect on Industry

This change will enhance the safety of electrical systems by making it easier to identify and replace malfunctioning SPDs.

Article 245

Overcurrent Protection for Systems Rated Over 100 Volts ac, 1500 Volts dc

Summary of Change

The move was intended to increase the usability of the NEC by consolidating requirements for systems operating over 1,000 volts into their own articles. The enforcement community has raised concerns about the absence of necessary requirements in the code and the need for updated standards due to the increased usage of medium voltage installations.

Various portions of Articles 215, 225, 230, and 240 dealing with conductors or systems operating at over 1,000 volts were relocated to the new Article 245, Overcurrent Protection for Systems Rated Over 1000 Volts AC, 1500 Volts DC.

What is its effect on Industry

These new articles will likely help users of the NEC to more easily find requirements specifically for systems operating at over 1,000 volts.

Article 250.24

Grounding of Service-Supplied Alternating-Current Systems

Summary of Change

Informational Note under 250.42(A)(1) was revised to comply with the NEC Style Manual.

- In the Exception to 250.24(2), "The system" was replaced with "Impedance grounded system" to clarify the exception. This change helps to correlate with 250.36 and the updates made in that section.
- Section 250.24(D)(2), Connected in Parallel, was relocated after "Conductors." It has been revised into a list format for additional clarity and usability. The last sentence in the paragraph under (2) has been rewritten and added as 250.24(D)(2)(a) and (D)(2)(b) in accordance with 250.24(D)(1). CMP (Code Making Panel)-5 also added

the word "shall" in (a) and (b) to emphasize the requirement when conductors are connected in parallel. The last sentence in (b) was moved and rewritten into the paragraph under (2) for added clarity.

CMP (Code Making Panel)-5 made several changes within Section 250.24 to comply with the NEC Style Manual. The panel also added the word "shall" where necessary to clarify the requirements for electrical professionals when installing conductors connected in parallel.

What is its effect on Industry

This change has minimal impact but adds clarity to the requirements described in this article for installing conductors connected in parallel. This will benefit electrical professionals by providing clearer guidance for this type of installation.

Article 250.24

[D][2] Grounding of Service-Supplied Alternating-Current Systems

Summary of Change

Section 250.24(D)(2) has been revised for technical accuracy and easier understanding by electrical professionals. When grounded service conductors in both raceways and cables are connected in parallel, the size of the grounded conductor should be based on the size of the ungrounded conductor in the raceway or cable. The previous language used the word "installed," which was grammatically incorrect. The word "connected" has replaced "installed," adding clarity and usability to the Code.

CMP (Code Making Panel)-5 received substantiation to clarify the requirements concerning grounded parallel conductors for service equipment. As a result, Section 250.24(D)(2) was revised.

What is its effect on Industry

This change was a grammatical adjustment to ensure the NEC language is specific about the action taking place.

Article 250.30

[C] Outdoor Source, Exception

Summary of Change

The word "neutral" has been removed from impedance grounded neutral systems to align with changes made elsewhere in the code, in compliance with the NEC Style Manual. This update correlates with the new definition found in Article 100 for Impedance Grounded System and ensures consistency with the requirements in Sections 250.36 and 250.187.

CMP (Code Making Panel)-5 removed the word "neutral" from Section 250.30(C) to ensure consistency with other locations within the NEC and with the language found in Sections 250.36 and 250.187.

What is its effect on Industry

The creation of the new definition for Impedance Grounded System will benefit electrical professionals. Achieving consistency in terminology makes the Code more user-friendly.

Article 250.36

Impedance Grounded Systems — 480 Volts to 1000 Volts

Summary of Change

The word "device" has been added after the word "impedance" several times throughout Section 250.36 to designate an object and not a value. A new definition was also created for "impedance grounding conductor" to replace the phrase "grounded system conductor." It is further clarified that the conductor connecting the neutral point to the impedance of an impedance grounded system does not meet the definition of a "grounded conductor" in Article 100.

- Another change was made by deleting the word "Equipment" and replacing it with "Impedance" for the definition of "Impedance Bonding Jumper."

CMP (Code Making Panel)-5 removed the words "High" and "Neutral" from the title of Section 250.36, renaming the section to Impedance Grounded Systems — 480 Volts to 1000 Volts. Additionally, a new definition for "impedance grounding conductor" was created.

What is its effect on Industry

The changes in Section 250.36 are not expected to have a significant impact on the electrical industry. These revisions make the text more accurate regarding "Impedance Bonding Jumpers," thereby adding clarity and consistency to the NEC.

Articles

250.50, Grounding electrode system

250.52 [A][3][1] Concrete -Encased electrode

250.52 [B][2] Not permitted for use as Grounding Electrodes

Summary of Change

The term "reinforcing steel or rods" is commonly known as "rebar," which makes it easier to understand in the construction industry. Using this term also ensures consistency with the language used in 250.68(C)

The term "reinforcing steel or rods" was replaced by CMP (Code Making Panel)-5 with "rebar." This revision was made across all three sections of the Code for consistency.

What is its effect on the industry

This new term allows electrical professionals and the industry to consistently use the word "rebar" when referring to grounding electrode systems, concrete-encased electrodes, and grounding electrodes.

Article 250.64

[G] Enclosures with Ventilation Openings

Summary of Change

The ventilation openings in equipment enclosures are designed to ensure adequate cooling air is provided for the safe operation of the equipment under both normal and abnormal conditions. The equipment's listing assumes these openings will not be obstructed, such as by the installation of raceways or conductors through the opening. Installing conductors, such as a grounding electrode conductor, through these openings can obstruct ventilation and is therefore now generally prohibited. A similar requirement was introduced in the 2020 NEC under 450.10, specifically for transformers.

CMP (Code Making Panel)-5 introduced a new requirement prohibiting the use of ventilation openings in enclosures for installing the grounding electrode conductor.

What is its effect on the industry

Electrical professionals will need to ensure the proper installation of the grounding electrode conductor through an enclosure wall opening that is intended for ventilation. This could involve a conduit opening when the conduit is installed, or an opening in the enclosure provided for a bare grounding electrode conductor, as found in some panelboard cabinets.

Article 250.70

Grounding and Bonding Conductor Connection to Electrodes

Summary of Change

Public inputs to CMP (Code Making Panel)-5 proposed several changes. One of these highlighted that there are no pipe fittings, pipe plugs, or other devices suitable or identified for attaching a grounding electrode conductor. Consequently, this list item was removed. The relocation of the list item for communications equipment left only one item in the list, which was already covered in the main section text, allowing for the deletion of all list items. Additionally, an informational note was added from another public input to

acknowledge that UL 467, which covers the listing of fittings and devices for connecting to grounding electrodes, does not differentiate between direct burial and concrete encasement.

CMP (Code Making Panel)-5 has divided the section into new subsections (A) and (B), eliminating the previous list of methods for connection to grounding electrodes. The list item for the communications system has been moved to the new subsection (B) as a permitted method. Additionally, a new informational note was added to clarify that a connector or fitting listed as suitable for direct burial is also listed and suitable for concrete encasement.

What is its effect on the industry

The reorganization aims to provide clarity to electrical professionals and eliminate connection methods that are not available for use. The informational note addresses concerns raised by installers or inspectors regarding these types of grounding connections.

Article 250.94

[A] The Intersystem Bonding Termination Device

Summary of Change

Section 250.94(A) outlines the requirements for installing the Intersystem Bonding Termination Device (IBT). Editorial revisions were made to clarify (A)(4) list item a. CMP (Code Making Panel)-5 changed the word from "be" to "to" to correctly refer to an object such as a metal enclosure. The phrase "or to" was replaced with "for," now recognizing the IBT as the location "for" the grounding electrode conductor.

- Section 250.94(A)(4) b added the phrase "that is supplied by a feeder or branch circuit" for clarity. Additionally, similar adjustments made in "a" were applied to "b" to indicate that the conductor is terminated on the IBT.
- Informational Note 1 was returned to CMP (Code Making Panel)-5 by the Correlating Committee to comply with the NEC Style Manual. CMP (Code Making Panel)-5 ultimately removed the Informational Note, as the committee could not find a way to meet the manual's requirements.

CMP (Code Making Panel)-5 made minor wording changes in 250.94(A)(4) a and b and removed Informational Note 1, which lacked significant value within the code and did not comply with the NEC Style Manual.

What is its effect on the industry

The updated language in 250.94(A)(4) a and b helps clarify this section for electrical professionals. Informational Note 1 was removed for usability, as it was determined that it did not add value to the Code.

Article 250.106

Lightning Protection Systems

Summary of Change

CMP (Code Making Panel)-5 removed most of Informational Note No. 1 but retained the first sentence. Part of Informational Note No. 1 was relocated to Informational Note No. 2, with changes made to comply with the NEC Style Manual.

- The year of the edition of the standard used as a reference was removed, as it is often outdated by the time the NEC is published. This revision is permitted by the new language in 90.5(C), which states that the reference should be considered as the latest edition of the standard unless the standard reference includes a date.

References to the NFPA 780 standard were removed from Informational Note No. 1 and updated for Informational Note No. 2 by CMP (Code Making Panel)-5.

What is its effect on the industry

This change will help electrical professionals and the electrical industry better understand this section. It is also important for Code users to understand that when a standard is referenced, it should be considered the most up-to-date version unless a publication date has been included.

Article 250.118

[A] Types of Equipment Grounding Conductors

Summary of Change

A new Item (6)(f) has been included as an acceptable wiring method for locations where high resistance to corrosion is encountered. The stainless-steel core offers higher resistivity compared to other metal types used with flexible conduits. Additionally, a separate internal equipment grounding conductor (EGC) or an external bonding jumper is required to ensure an effective ground-fault current path.

What is its effect on the industry

Substantiation was received by CMP (Code Making Panel)-5 for recognizing stainless-steel flexible and liquid-tight metal conduit and requiring a wire-type equipment grounding conductor (EGC). This resulted in the addition of a new list item (f) in Section 250.118(A).

Article 250.130

Equipment Grounding Conductor Connections

Summary of Change

Prior to the 2023 NEC, this requirement only applied to non-grounding type receptacles being replaced with grounding-type receptacles. Section 404.9(B) required that snap switches be connected to an equipment grounding conductor (EGC). An exception allowed a replacement switch to be provided with GFCI protection when a grounding means was not available in the existing enclosure. The previous provision of 250.130(C) only addressed the replacement of receptacles.

- For the 2023 NEC, the replacement of snap switches without an equipment grounding terminal with snap switches with an equipment grounding terminal was added to 250.130. Installers now have the

option to install an EGC for switches as well as receptacles. An added informational note provides a link to the 404.9(B) requirements.

CMP (Code Making Panel)-5 added snap switches to the items that must conform to the requirements found in 250.130(C) for their equipment grounding conductor connection.

What is its effect on the industry

Section 250.130 now provides electrical professionals with coordination with Article 406 regarding the replacement of non-grounding type receptacles and non-grounding type snap switches. This revision enhances usability and clarity for Code users.

Article 250.140

Frames of Ranges and Clothes Dryers

Summary of Change

At times, services are replaced, modified, upgraded, or optional standby systems (transfer switches) are installed. In some cases, the existing load center, which was previously the service equipment, is now being supplied by a feeder. The grounded conductor is not permitted to be used as part of the effective ground-fault current pathway. This new revision provides a safe alternative to replacing the existing 3-wire nonmetallic sheathed cables.

- A new subdivision, Part (A), covers the installation of equipment grounding conductors (EGCs) to ranges and dryers. Part of the 250.140 text was moved to Part (A), detailing how to make the connection specified in 250.134 or 250.118.
- This revision further clarifies that when there is only a grounded conductor for ranges and dryers in existing installations, compliance with Part (B) is required. New list items (3) and (5) were added. In the previous edition of the Code, part of this was an exception, but now it is a main rule.

CMP (Code Making Panel)-5 recognized the need for clarification to make Section 250.140 more understandable. It has been revised by converting the main requirement and the former exception into two titled subdivisions.

What is its effect on the industry

The changes in Section 250.140 clarify requirements for electrical professionals concerning installations of ranges and dryers. The major change is that the grounded conductor must be insulated or field-covered within the supply enclosure using a listed insulating material. This will prevent contact between an uninsulated conductor and any normally non-current-carrying metal parts of the equipment.

Article 250.148

Continuity of Equipment Grounding Conductors and Attachment in Boxes

Summary of Change

Public inputs were made to CMP (Code Making Panel)-5 for several changes, highlighting the need to clarify whether the interconnection of all wire-type equipment grounding conductors, regardless of circuit association, is required, or if separate connections for the equipment grounding conductors of each circuit are sufficient.

CMP (Code Making Panel)-5 modified subdivision (A) to specify that all equipment grounding conductors spliced or terminated within a box must be connected together, regardless of whether they belong to different circuits. Additionally, the reference for the connection means complying with 250.8 was relocated to this section.

What is its effect on the industry

Electrical professionals need to be aware that the current requirement mandates connecting all equipment grounding conductors together, not just those associated with a single circuit. This requirement has been reversed several times over the past few code cycles, causing confusion depending on which edition of the code is adopted. Additionally, they must ensure that a properly sized bonding connection is made to the metal box, as many times this has only been a 12 AWG copper pigtail.