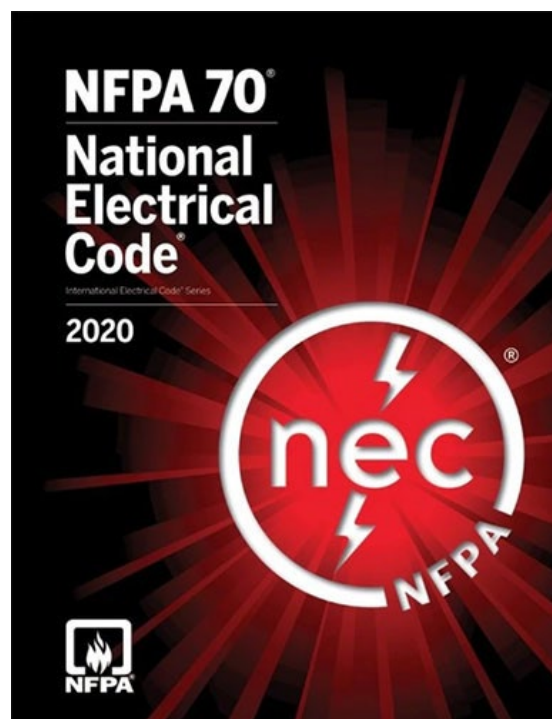




Summary of the NEC 2020 Changes



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Summary of the NEC 2020 Changes

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.

The National Electrical Code (NEC) 2020 brought several significant changes and updates to enhance electrical safety, efficiency, and modernize installations. Here are some key changes:

1. **GFCI Protection Expansion:**

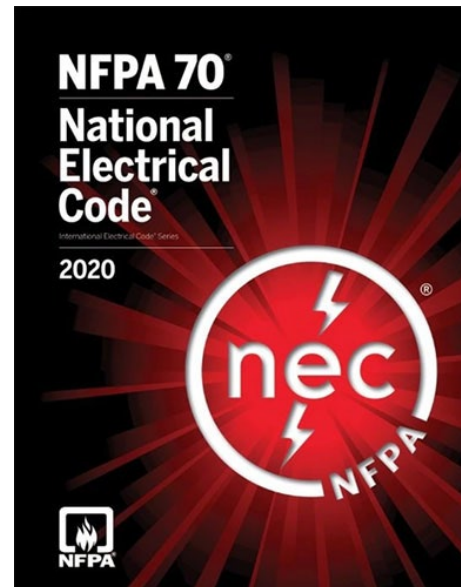
- Ground-Fault Circuit Interrupter (GFCI) protection is expanded to include 250-volt receptacles and to additional locations like kitchens and laundry areas.

2. **Emergency Disconnects:**

- New requirements for emergency disconnects located outside of one- and two-family dwelling units. This allows first responders to safely disconnect power in an emergency.

3. **Surge Protection:**

- Surge protection is required for dwelling unit services to protect against transients that can damage sensitive electronics.



4. **Arc-Fault Circuit Interrupter (AFCI) Protection:**
 - Expanded requirements for AFCI protection in more areas of dwelling units to prevent electrical fires.
5. **Marinas and Boatyards:**
 - Enhanced safety measures for electrical systems in marinas and boatyards to prevent electric shock drowning.
6. **Labeling and Identification:**
 - Improved labeling requirements for identifying power sources and disconnecting means, especially in multi-tenant buildings.
7. **Energy Management Systems:**
 - New provisions for the integration of energy management systems (EMS) to optimize energy usage.
8. **Conductors and Overcurrent Protection:**
 - Revised rules for sizing conductors and overcurrent protection, including updates to ampacity tables.
9. **Wiring Methods and Materials:**
 - Updated standards for wiring methods and materials to accommodate new technologies and installation practices.
10. **Electric Vehicle (EV) Charging:**
 - Enhanced requirements for the installation of electric vehicle charging infrastructure to support the growing use of electric vehicles.
11. **Solar Photovoltaic (PV) Systems:**
 - Updated requirements for solar photovoltaic systems, including rapid shutdown provisions for firefighter safety.
12. **Health Care Facilities:**
 - Revised standards for electrical systems in health care facilities to ensure patient safety and system reliability.
13. **New Articles and Revisions:**
 - Introduction of new articles addressing emerging technologies and revisions to existing articles for clarity and modernization.

These changes reflect the NEC's commitment to improving electrical safety and accommodating technological advancements in the electrical industry.

The definitions in Article 100 are now categorized into Parts I, II, and III. The changes also include guidance on definitions that remain in individual articles, specifying whether the definition is specific to that article or applicable throughout the NEC. Additionally, there are a few new definitions, and some existing ones have been clarified.

100 Part III—Definitions, Hazardous (Classified) Locations

The 2020 edition of Article 100 introduced Part III, whereas previous editions only had two parts. Many definitions related to hazardous (classified) locations, which were previously scattered across various articles, were moved to Part I of Article 100 and arranged alphabetically. This rearrangement made it difficult for some Code users to access these definitions, so they were relocated to a new Part III, Hazardous (Classified) Locations, without any technical changes for 2020. Additionally, all definitions remaining in the “xxx.2” sections of Articles 500, 501, 502, 503, 504, 505, 506, 511, 513, 514, 515, and 516 were moved to this new Part III of Article 100.

110.3 Examination, Identification, Installation, Use, and Product Listing (Certification) of Equipment

The revision clarifies that equipment which is listed, labeled, or both, must be installed according to the instructions included in the listing or labeling. However, the ultimate decision on how the product is used or installed remains with the authority having jurisdiction (AHJ).

110.5 Conductor Material

Copper-clad aluminum conductors have long been overlooked, likely due to limited availability stemming from low demand. Given that most electrical current travels on the conductor's surface (skin effect), copper-clad aluminum should be as reliable as pure copper. This section was revised to remove the Informational Note regarding copper-clad aluminum conductors and incorporate it into the rule text.

110.12 Mechanical Execution of Work

This rule is one of the most contentious and practically unenforceable in the NEC due to its subjective nature—there is no clear definition of “installed in a neat and workmanlike manner.” Originally found in the “xxx.24” sections of

some Chapter 7 and 8 articles, it was relocated to Article 110 for general application throughout the Code.

110.14 Conductor Termination and Splicing

Properly tightened electrical terminations are crucial, as loose connections can lead to numerous service calls, equipment damage, and even electrical fires. This rule, which first appeared in the 2020 NEC, was revised to require the use of an approved method (not just a calibrated torque tool) to achieve the necessary torque value. Three new Informational Notes provide additional guidance for Code users.

110.21 Markings

The reconditioning of equipment, and the conditions under which it is permitted, was addressed throughout the Code during the 2020 revision cycle. This section was clarified to require that reconditioned equipment be clearly identified as such, and that the original listing marking be removed.

110.22 Identification of Disconnecting Means

All electrical circuits, regardless of size, must have a clearly identified means to disconnect power. Incorrectly turning off circuits can cause significant problems. The requirement to identify disconnecting means was expanded to include the identification of the source of the circuit supplying the disconnecting means.

110.24 Available Fault Current

Fault current, which far exceeds rated current, is extremely dangerous due to its sheer power, capable of vaporizing metal. The word "maximum" was removed from "available fault current" because the new definition of "Fault Current, Available (Available Fault Current)" specifies that this current is the largest amount that can be delivered into a short circuit at that point in the system. A new Informational Note was also added.

110.26 Spaces About Electrical Equipment

Clear and accessible working space around electrical equipment is critical for safety. The NEC emphasizes the importance of these spaces to protect electrical workers. Although not all changes result from incidents, some revisions in the 2020 cycle aimed to enhance safety. For instance, equipment installed on concrete pads affects the equipment itself, but the pad is not considered equipment and could extend beyond the 6 inches

permitted for electrical equipment. This change clarifies such situations. Additional clarifications were made regarding entrances and egresses to and from working spaces (C) and the illumination (D) of these areas.

110.28 Enclosure Types

Two new Informational Notes were added to the enclosure selection rule, advising that dust-tight enclosures are suitable for use in Class II, Division 2 dust hazard areas.

Chapter 2

WIRING AND PROTECTION

200.3 Connections to Grounded System

While there are both neutral conductors and grounded-phase conductors, this section primarily focuses on differentiating neutral conductors from phase conductors and grounded-phase conductors. The rule ensuring the proper connection of neutral conductors was revised to clarify that it applies to all premises wiring systems, both indoor and outdoor.

200.6 Identification of Grounded Conductors

Subsection (A) was revised to clearly address the identification of insulated conductors. Exception 1 to 200.6(E), which previously allowed the re-identification of conductors in multiconductor cables as neutral or grounded-phase conductors under conditions of maintenance and supervision by qualified persons, was shortened and moved to the latter part of this rule.

200.9 Means of Identification

The requirement for a substantially white color terminal for neutral conductor connections was revised to apply only to devices or equipment with polarized connections. It was also modified to recognize that neutral termination points may be identified by a silver color.

200.10 Identification of Terminals

The color used to identify the neutral conductor connection on most wiring devices, such as duplex receptacles, is silver rather than “substantially white,” so the language was revised to reflect this fact.

210.5 Identification for Branch Circuits

The NEC has shifted from using the term “nominal” to “voltage classes” when referring to different voltages. This adjustment may require some getting used to, as there are much higher “voltage classes” throughout the electrical industry. For example, 240/120V is considered a low nominal voltage, but outside the NEC, lower-class voltage might be anything below 5,000V, and medium-class voltage can be as high as 35,000V. Consequently, this rule was revised to clarify that where multiple systems of the same “voltage class” exist, all systems of the same voltage class can use the same identification. Therefore, if you have 480/277V and 208Y/120V within the same facility, this rule requires them to be marked to distinguish the different voltage classes, with consistent marking styles.

210.6 Branch-Circuit Voltage Limitations

Voltage limitations exist for dwelling occupancies where circuits are terminated. The rules for circuits with voltages exceeding 120V between conductors but not exceeding 277V to ground were editorially revised without technical changes.

210.8 GFCI Protection

Ground-fault circuit-interrupter (GFCI) protection has been instrumental in safeguarding people from electrical hazards. Each Code cycle places increasing emphasis on GFCI protection and the locations where it is required. Given the focus on this section, it is likely that all circuits in dwelling units will eventually require GFCI protection. The 2020 revisions to this section include numerous clarifications, expansions of existing rules, and new additions. Some items were relocated to their appropriate articles, as indicated in the Informational Notes, necessitating the detailed analysis that follows.

210.11 Branch Circuits Required

The rule in 210.11(C)(3) was revised to clarify that the receptacle outlets required by 210.52(D), and any additional receptacle outlets installed to serve any countertop or similar work surface, must be supplied by one or

more 20A branch circuits. Section 210.11(C)(4) was also revised to allow receptacle outlets, other than those required by 210.52(G)(1), to be supplied by branch circuits with ratings other than 20A.

210.12 Arc-Fault Circuit-Interrupter Protection

The requirement for AFCI protection where a branch circuit is extended or modified was expanded to include guest rooms and guest suites. Additionally, the exception to this rule was revised to specify that conductors inside an enclosure do not count toward the 6-foot limit and that adding a splicing device does not trigger the AFCI requirement.

210.15 Reconditioned Equipment

The Code addresses the reconditioning of electrical equipment globally. A new rule was added prohibiting the reconditioning of certain protective devices required by Article 210, such as GFCIs, GFPEs, and AFCIs, due to the risks involved with reconditioning these sensitive, lifesaving devices.

210.19 Conductor Sizing

Understanding current flow and electron movement in a circuit reveals that a conductor rated higher than the termination rating can create a "funnel effect," causing a "traffic jam" of electrons that generates heat. This is undesirable, and the branch-circuit minimum conductor ampacity rule in 210.19(A)(1) was clarified by adding a reference to the termination requirements of 110.14(C). A new exception, mirroring 215.2(A)(1)(a) for feeders, was added to permit the use of 90°C conductors between terminal blocks installed outside of the source and load termination enclosures. For more on these fundamentals, check out Mike Holt's Illustrated Guide to Electrical Fundamentals.

210.52 Dwelling Unit Receptacle Outlet Requirements

Section 210.52 often sparks debates, ranging from defining a countertop versus a work surface to determining the starting point for measuring a peninsula. The 2020 revision reorganized and clarified much of this section and provided guidance for measuring peninsula receptacles. The rules regarding balconies, decks, basements, and garages were also expanded. The term "wall switch" was replaced by "listed wall-mounted control device," reflecting a shift towards electronic and wireless devices throughout the Code.

210.63 Equipment Requiring Servicing

This rule, aimed at reducing the need for extension cords to service equipment such as HVAC units, combines the requirements of 210.63 and 210.64. It mandates receptacle outlets for servicing equipment and has been expanded to include all serviceable equipment, not just heating and air-conditioning.

210.65 Meeting Rooms

This section was relocated from 210.71 to follow the receptacle rules more logically. The meeting room receptacle outlet rule was clarified to specify the number and location of required receptacle outlets. Section 210.65(B)(1) details the required receptacles in fixed walls of meeting rooms.

210.70 Lighting Outlet Requirements

The control method for required lighting outlets was changed from "wall switch" to "listed wall-mounted control device." The rule for lighting outlets in storage and equipment spaces in 210.70(C) was modified to require control devices at each entry point and to permit the use of listed wall-mounted control devices.

215.2 Conductor Sizing

The Code has been updating the "not more than 600V" limitation to "not more than 1,000V." The feeder minimum conductor ampacity rule has been clarified, and a reference to the termination requirements of 110.14(C) was added to align with this trend. With photovoltaic (PV) systems sometimes generating more than 600V, it is beneficial that voltage ratings across the board have been increased, including the manufacturer's listing of hand tools and test equipment to the same 1,000V standard.

215.9 Ground-Fault Circuit-Interrupter Protection for Personnel

GFCI devices for feeders are now permitted to provide the protection required by 210.8 for circuits of any ampacity. The GFCI protection requirements have been expanded to include circuits rated higher than 15A and 20A. Feeders with GFCI protection can now protect these higher-rated circuits when such protection is required.

220.11 Floor Area

When calculating the total floor area of a structure, it is based on the building's outside footprint. This measurement requirement was moved from 220.12 into its own standalone section.

220.12 Lighting Load for Non-Dwelling Occupancies

This section now only applies to non-dwelling occupancies, and the lighting load table was revised to align more closely with the maximum permitted lighting loads specified in energy codes. Although energy code lighting loads are much lower than those in the NEC, the Code ensures that services and feeders can still support non-compliant loads. The scope of this section was changed to include only lighting loads for non-dwelling occupancies and was reorganized from a single paragraph with exceptions into subsections. The previous Exception 1 became positive text in (B), making Exception 2 unnecessary, and it was deleted.

220.14 Other Loads—Occupancies

For service and feeder calculations, clarifications were made to subsections (J) and (K). Additionally, a new subsection (M) was added to address the lighting and receptacle loads for hotel and motel occupancies.

220.16 Loads for Additions to Existing Installations

Any load additions to an existing dwelling unit must be calculated for an expansion of any size.

220.42 General Lighting Demand Factors

Hospitals require substantial lighting, and the previous demand factors underestimated the electrical power needed. This change addresses that underestimation. Conversely, lighting demands in the hospitality sector have decreased in recent years, and this change reflects that. As a result, the demand factors for hospital lighting loads were eliminated, and those for hotels and motels were decreased.

220.53 Appliance Load, Dwelling

The 75 percent demand factor for four or more fixed appliances when calculating a service or feeder is now limited to appliances rated at $\frac{1}{4}$ hp or greater, or 500W or greater.

220.60 Noncoincident Loads

When determining demand loads unlikely to burden the service simultaneously, the lesser of these loads can be disregarded for service sizing purposes. This rule was clarified to state that when a motor is one of the noncoincident loads, 125 percent of the motor load must be used in the calculation.

220.87 Determining Existing Loads

A new exception prohibits using demand load data where the system is also supplied by a renewable energy system. It is challenging to accurately determine the contribution from renewable energy sources like PV systems or the reduction from peak shaving when the PV system is under load, making this method unreliable.

225.4 Conductor Covering

Conductors run on the exterior of buildings and structures are exposed to direct sunlight, warmer environments, and more heat overall. "Thermoplastic" (rubber) coverings do not hold up to heat as well as "Thermoset," so "Rubber Covered" was replaced with "Thermoset" to include rubber-covered conductors.

225.10 Wiring on Buildings (or Other Structures)

The list item for multiconductor cable was deleted, and new list items for SE and TC-ER cables were added, as the term "Multiconductor" was too broad.

225.15 Supports over Buildings

The requirement for outside branch circuits or feeders passing over a building was updated to mandate they be securely supported, replacing the previous reference to 230.29. This correction addresses the mistaken reference, as bonding metal support structures (per 230.29) is only appropriate ahead of the service disconnect.

225.19 Clearances from Buildings

This section was revised to clarify that it applies only to overhead spans of open conductors and open multiconductor cables, not to cable assemblies with an outer jacket, such as Type SE cable.

225.30 Number of Supplies

A new list item (A) permits docking facilities and piers to be supplied by multiple feeders or branch circuits. Similar to services, the general rule allows only one supply source per building. Revised language in (B) permits up to six feeders to a second building or structure under limited circumstances.

230.31 Underground Service Conductor Size and Ampacity

The title of this section was editorially changed from "Rating" to "Ampacity" to align with the global effort of using the more accurate term. There are no technical changes to this rule regarding underground service conductors.

230.42 Minimum Size and Ampacity

This section, concerning the minimum sizing of service-entrance conductors, also underwent an editorial title change from "Rating" to "Ampacity," matching the revisions in 230.31. Additionally, a new Informational Note regarding busways was added.

230.43 Wiring Methods

An additional wiring method, Type TC-ER cable, was added to the list of permitted wiring methods for service-entrance conductors.

230.44 Cable Trays

Type TC-ER cable was added to the existing list of five other types of service-entrance cables that are allowed to be installed in cable trays.

230.46 Spliced Conductors

The use of power distribution blocks with higher termination temperature limitations, allowing the use of smaller conductors, has become a cost-effective method for installing larger services. When used ahead of the service disconnect, these blocks must be marked as suitable for this purpose. However, the NEC has delayed enforcement of this rule until the next Code cycle to give manufacturers ample time to comply. This section

now includes requirements for devices used to splice or tap service conductors.

230.62 Service Equipment—Enclosed or Guarded

Despite the advisories to de-energize and avoid working on “hot” electrical equipment, there are instances where shutdown is not an option. This new rule requires uninsulated service-phase busbars or terminals to be protected from accidental contact by barriers. This, along with proper personal protective equipment (PPE), will help protect service technicians.

230.66 Marking for Service Disconnect

Service equipment must be listed or field evaluated. While it has generally been required to be listed, service equipment assembled or constructed in the field cannot always be listed. The components may be listed for their intended purpose, but once assembled, the entire unit becomes unlisted. This is where a Field Evaluation Body (FEB) comes in, conducting a field evaluation that suffices as documentation.

230.67 Surge Protection

This new section requires the installation of a surge-protective device (SPD) for all dwelling unit services. Previously, surge protection for dwelling units was optional and typically considered an “extra” by electricians.

230.70 Service Disconnect Requirements

This rule was revised to clarify that only the phase conductors need to be disconnected from the service conductors, prohibiting the neutral conductor from being part of this disconnection.

230.71 Number of Service Disconnects

A service is generally permitted to have only one disconnecting means. However, the number of service disconnects can vary based on the number of disconnects, their grouping, and special circumstances permitting more than one service disconnect.

230.82 Connected on Supply Side of the Service Disconnect

Emergency disconnect switches, as required by 230.85, and meter-mounted transfer switches were added to the list of equipment that can be connected on the supply side of the service disconnect. When connected ahead of metering equipment, this setup is referred to as “cold sequencing.”

Many utility companies are not particularly fond of this practice because it allows consumers to de-energize the electrical service before the metering equipment. This creates security concerns, as these disconnects, intended for emergencies, may not always be used with noble intent.

230.85 Emergency Disconnects

One- and two-family dwelling units are now required to have an “emergency disconnect” installed in a readily accessible exterior location, as per 230.85. This change ensures that firefighters can safely disconnect the electric supply to a fully engulfed residence without potentially standing in a pool of electrified water.

240.2 Definitions

As part of the global reorganization of definitions this Code cycle, new parent text was added to specify that the definitions in this section apply only within Article 240. Additionally, to ensure clarity and consistent enforcement, the term “Reconditioned” is defined here as well as in Article 100.

240.5 Protection of Flexible Cords, Flexible Cables, and Fixture Wires

Conductors in most fixtures are usually smaller than those in ordinary branch circuits, which are protected by 15A and 20A overcurrent devices. The language now specifies that 16 AWG and 18 AWG fixture wire can be protected with a 15A overcurrent protective device (OCPD) in addition to the previously permitted 20A OCPD. This practical adjustment follows the rule that if something is not permitted by the Code, it cannot be done.

240.6 Standard Ampere Ratings

Adjustable circuit breakers require a high level of expertise to set correctly. To prevent unqualified personnel from making inaccurate and potentially dangerous adjustments, a fourth method of restricting access (password protection) was added for these adjustable trip circuit breakers.

240.21 Location in Circuit

Feeder circuits are allowed to be protected at a higher rated current than the individual loads they serve, but the loads and smaller conductors feeding them still need protection. This is provided by a suitably rated overcurrent device for the smaller demand load. This rule was revised to clarify that these types of taps are permitted at any point on the load side of the feeder OCPD.

240.24 Location of Overcurrent Protective Devices at Premises

Overcurrent protective devices, whether circuit breakers or fuses, must be readily accessible. The word "switches" previously used in this rule was edited to "switches that contain fuses."

240.33 Vertical Position

Circuit-breaker enclosures (panelboards) need to be oriented vertically. They can be mounted horizontally as long as, when operating the device, "on" is up and "off" is down. This editorial change aims to prohibit mounting circuit breaker enclosures in a face-up position, while permitting horizontal operation of circuit breakers.

240.40 Disconnecting Means for Fuses

Most fused disconnects are designed so that the blades of the knife switch are above the fuse cartridge, automatically de-energizing the fuse when the disconnect is turned off. Cartridge fuses must now have a line-side disconnect, even where they are accessible only to qualified persons.

240.62 Reconditioned Equipment

The 2020 NEC introduces global rules for reconditioning electrical equipment. A new section prohibits reconditioning low-voltage fuse holders and low-voltage nonrenewable fuses.

240.67 Arc Energy Reduction—Fuses

Reducing the potential dangers of arc faults or arc blasts further protects electricians and service technicians. A new sentence in subsection (A) requires that the method chosen to reduce the clearing time of a fuse must operate at a value below the available arcing current. Additionally, a new list item (4) permits the use of "current limiting, electronically actuated fuses." Subsection (C) was added, requiring the arc energy reduction system to be performance tested upon initial installation.

240.86 Series Ratings

Series rating of electrical service and distribution equipment is a specialized skill, requiring qualified personnel. On larger jobs, it is usually engineered and included in the drawing specifications. Editorial revisions to the series rating rule replaced “acceptable” with “approved,” and clarified the motor contribution in subsection (C), without changing the actual requirements.

240.87 Arc Energy Reduction—Circuit Breakers

The changes here mirror those in 240.67 for fuses; reducing the dangers of arc faults or arc blasts enhances the safety of electricians and service technicians. This change applies to circuit breakers, and the revision in (B) clarifies that temporarily adjusting the breaker's instantaneous trip setting is not an acceptable method of arc energy reduction.

240.88 Reconditioned Equipment

The 2020 NEC introduces global rules for reconditioning electrical equipment. This new section specifies the types of equipment associated with circuit breakers that are permitted to be reconditioned.

240.91 Protection of Conductors

Subsection (B) was clarified to allow the overcurrent protective device (OCPD) to have a rating other than a standard rating as found in 240.6 and provides a reference to Table 240.92(B).

Article 242 Overvoltage Protection

This new article replaces Articles 280, Surge Arresters, Over 1,000V, and Article 285, Surge-Protective Devices (SPDs), 1,000V or Less.

250.6 Objectionable Current

This change clarifies that electronic equipment must be connected to an equipment grounding conductor, even if it results in “objectionable current” that interferes with the equipment’s operation. This is particularly troublesome for equipment sensitive to the alternating-current frequency, such as audio equipment, which may experience a “60 cycle” hum or buzz.

250.12 Clean Surfaces

This rule now requires clean surfaces for both bonding and grounding connections, ensuring metal-to-metal contact. Paint and other coatings can create a nonconductive layer, interfering with or preventing electrical continuity.

250.20 Systems Required to be Grounded

An Informational Note was added to the end of subsection (B), Alternating-Current Systems 50V to 1,000V, referencing high-impedance grounding as an effective tool to reduce arc flash hazards. This information was extracted from Annex "O" of NFPA 70E, Standard for Electrical Safety in the Workplace.

250.25 Grounding for Supply Side of the Service Disconnect

Redundant text in 250.25 was removed, as not all equipment connected to the utility is considered a service. PV system power production equipment may be connected in parallel with a service or even directly to the utility for power production without parallel service equipment. By referencing parts of 250.24, this rule ensures supply-side equipment is connected to a grounding electrode system, has an effective ground-fault current path, and is bonded with the stringent requirements of 250.92 and 250.102(C).

250.26 Conductor to Be Grounded-Alternating-Current Systems

This section was revised to clarify which conductor of various grounded systems should be grounded, now presented in a list format containing items (1) through (5). For example, the neutral conductor of a 3-wire system should be grounded.

250.28 Main Bonding Jumper and System Bonding Jumper

This change aligns with the requirements in 250.102(C)(1) for sizing wire-type bonding jumpers and permits the use of aluminum and copper-clad aluminum for main bonding jumpers, helping to avoid any confusion.

250.30 Separately Derived Systems

The term "separately derived systems" was replaced with "power sources of the same type" for clarity. Several list items were clarified, and a new exception was added to (A)(1)(b), describing how the system bonding jumper (SBJ) should be connected when multisource separately derived systems are involved. Emphasis was placed on the fact that the neutral

conductor need not be larger than the phase conductors, and clarification was provided for sizing the tap conductor from a common grounding electrode conductor with an exception to 250.30(A)(6)(b).

250.32 Buildings Supplied by a Feeder

The text was clarified to require a grounding electrode system and a grounding electrode conductor to be installed at a building supplied by feeders. This means that a grounding electrode and grounding electrode conductor are required at a detached garage with electrical power.

250.34 Generators—Portable and Vehicle- or Trailer-Mounted

This section, previously covering portable and vehicle-mounted generators, now includes trailer-mounted generators. Although vehicle- and trailer-mounted generators are functionally the same, they are named differently. This revision removes ambiguity and applies the same requirements to the newly distinguishable "trailer-mounted" generator.

250.36 High-Impedance Grounded Systems

An Informational Note was added to the end of this section.

250.53 Grounding Electrode Installation Requirements

A new last sentence prohibits using rebar as a conductor to interconnect the electrodes of a grounding electrode system. While steel reinforcing rod, known as "rebar," has proven effective as a "Ufer" ground, it cannot be used as a bonding jumper to interconnect grounding electrodes. However, it can be used to extend a grounding electrode itself, as defined in 250.68.

250.64 Grounding Electrode Conductor Installation

This section was revised into a list format (A) through (F) for greater usability, with technical changes only in subsection (A) and clarifications throughout. The technical change allows bare, covered, or insulated aluminum or copper-clad aluminum grounding electrode conductors if the installation complies with one of three list items. Bare conductors cannot be exposed to corrosive environments, and terminations to outdoor enclosures must be approved for the environment. Additionally, aluminum cannot be terminated within 18 inches of the earth.

250.68 Grounding Electrode Conductor and Bonding Jumper Connection to Grounding Electrodes

The requirements for using rebar to extend a grounding electrode were clarified in list items (C)(3)(a), (b), and (c).

250.98 Bonding Loosely Jointed Metal Raceways

This section was expanded to cover “expansion-deflection” or “deflection” fittings in addition to the previously covered expansion fittings. When metal-to-metal connections need to move or slide, a bonding jumper must be installed to maintain electrical continuity.

250.104 Bonding of Piping Systems and Exposed Structural Metal

This rule was revised to clarify that the bonding jumper to a metal water piping system is never required to be larger than 3/0 copper or 250 kcmil aluminum. The sizing requirements for bonding jumpers to a metal water pipe in a building or structure supplied by a feeder were moved from 250.102(C)(1) to 250.102(D).

250.109 Metal Enclosures

This new section explicitly permits metal enclosures to be used to connect bonding jumpers or equipment grounding conductors as part of the effective ground-fault current path. This practice, long understood but unwritten, is now officially permitted.

250.112 Specific Equipment Fastened in Place (Fixed) or Connected by Permanent Wiring Methods

Skid-mounted systems, prominent in industrial processes, are efficient for storage and distribution of machinery or equipment and include electrical wiring and control systems. This revision clarifies that for permanently skid-mounted equipment, only wire-type EGCs are sized by the rules in 250.122.

250.114 Equipment Connected by Cord and Plug

The requirement for portable luminaires (construction lights) to be connected to an equipment grounding conductor (a three-prong plug) was clarified. Non-technical edits were made to the parent text, and list items (3)e and (4)e were revised to include the term “portable luminaires,”

ensuring that the grounding needs for these products apply to both residential and non-residential occupancies.

250.119 Identification of Equipment Grounding Conductors

The revision to this section permits an insulated conductor of a multiconductor cable to be re-identified as an EGC, regardless of occupancy or conditions of maintenance and supervision.

250.120 Equipment Grounding Conductor Installation

The permitted uses of aluminum and copper-clad aluminum equipment grounding conductors (EGCs) have been expanded. The only technical change in this section is that bare, covered, or insulated aluminum or copper-clad aluminum grounding electrode conductors (GECs) are allowed if the installation complies with one of three list items. Bare conductors cannot be exposed to corrosive environments, and terminations to outdoor enclosures must be approved for the environment. Additionally, aluminum conductors cannot be terminated within 18 inches of the earth.

250.121 Restricted Use of Equipment Grounding Conductors

When the metal structure of a building is used as a grounding electrode conductor (GEC), it must be part of the grounding system. However, this is not the case for equipment grounding conductors (EGCs). A new subsection prohibits using the structural metal frame of a building or structure as an EGC. This rule was moved from 250.136(A) to this section.

250.122 Sizing Equipment Grounding Conductors

The language was revised to clarify that increasing the size of phase conductors due to required ampacity adjustment and/or correction does not require an increase in the size of the EGC, and an exception was added. This aims to resolve long-standing debates about the proportional increase of the EGC.

250.132 Short Sections of Raceway

This rule was revised to clarify that if short sections of raceways or cable armor are required to be "grounded," they must be connected to an EGC. Short sections of metal raceways used to sleeve and protect a wiring method and effectively connected to a metal box, which is connected to the EGC,

comply with this provision. A similar sleeve mid-span and not connected at either end is not compliant, and electrical continuity to ground must be established by another means.

250.136 Equipment Secured to Grounded Metal Supports

This rule was relocated from 250.121 and clarifies that equipment is considered connected to the EGC where a metal rack or structure is connected to an EGC and in electrical contact with the equipment. Its reappearance here indicates it applies throughout the NEC.

250.138 Cord-and-Plug-Connected Equipment

The incorrect term "grounded" was removed from this section to avoid confusion. "Grounded" means connected to the ground or Earth. An EGC, while eventually making its way to Earth when terminated at the main disconnecting means, serves a different purpose and must return to the source of electrical power to maintain an effective ground-fault current path.

250.146 Connecting Receptacle Grounding Terminal to an Equipment Grounding Conductor

The section's title and parent text were revised to clarify that a receptacle must be connected to an EGC. Accordingly, the language in (A), (C), and (D) was also revised to clarify that a receptacle grounding terminal must be connected to an EGC.

250.148 Continuity of Equipment Grounding Conductors in Boxes

This section was revised to reflect the Code-Making Panel's intent regarding the connection of EGCs in metal boxes. A universal rule is that metal electrical equipment must be bonded to ensure a connection to an effective ground-fault current path via the EGC when required, or to the GEC at the first means of disconnect. Although the rules in 250.148 have not changed, there has been confusion about what needs to be bonded in metal boxes and when special provisions are required. The minor revisions aim to provide proper clarification.

Chapter 3

WIRING METHODS AND MATERIALS

300.3 Conductors

Additional language was added to section (B)(1) to ensure that when making connections, taps, or extensions from paralleled conductors, each connection involves all the paralleled conductors of each phase and/or neutral.

300.4 Protection Against Physical Damage

Subsection (G) was expanded and reorganized into a list format (1) through (4), covering the use of listed metal fittings with smoothly rounded edges, insulated fittings, and threaded hubs.

300.7 Raceways Exposed to Different Temperatures

The rule in subsection (A) was revised to require the use of an “identified” sealant that is safe for both the conductors and the raceway, aligning with the language in 225.27.

300.22 Wiring in Ducts and Plenum Spaces

A conflict with the NEC style manual necessitated this revision in subsection (D), without any technical change. The correction involved specifying Code references by section instead of referring to an article as a whole, which is prohibited.

300.25 Exit Enclosures (Stair Towers)

This rule mandates that electrical wiring or equipment serving areas other than the emergency exit enclosure must be installed outside the exit structure.

310.1 Scope

Article 310 was completely reorganized, and its scope was changed to limit its application to conductors with a voltage rating up to and including 2,000V. Given that power distribution voltage classes can exceed 35,000V, 2,000V is relatively low. A new Article 311 was created for conductors with a voltage rating over 2,000V, separating the two voltage classes.

310.3 Conductors

Information regarding the minimum size of conductors for specific voltage ranges up to and including 2,000V, previously found in section and Table 310.106(A) of the 2020 Code, was relocated to 310.3 with revisions in the subsections.

310.4 Conductor Construction and Applications

The construction requirements for conductors suitable for carrying up to (and including) 2,000V, previously in 310.104 of the 2020 Code, were relocated to this section. Information for conductors suitable for carrying over 2,000V was moved to the new Article 311.

310.6 Conductor Identification

Section 310.110(C) from the 2020 NEC was relocated here, specifying that phase conductors must be clearly distinguishable from neutral and equipment grounding conductors. The term “grounding” was revised to “equipment grounding” for clarity.

310.10 Uses Permitted

The only technical changes involved moving all items related to conductors suitable for carrying over 2,000V to the new Article 311.

310.12 Single-Phase Dwelling Services and Feeders

The table now included in this rule has been frequently moved around the Code book, to the displeasure of many who were used to its previous location in 310.15(B)(7). It has now been placed in its own, hopefully permanent, section 310.12 and reformatted with individual subsections. Additionally, the table that was in Annex D since the 2014 NEC has been restored as Table 310.12.

310.14 Ampacities for Conductors Rated 0V Through 2,000V

The charging text and requirements from 310.15(A) and (C) in the 2020 NEC, which include adjustments and corrections to the ampacities of conductors rated 2,000V and below, are now found in this section.

310.15 Ampacity Tables

This section contains most of the information previously in 310.15(B), except for the dwelling unit service and feeder conductor size rules, which are now in 310.12. Section 310.15 includes rules for the conductor ampacity tables for conductors rated 0V through 2,000V, which were originally part of the table headings. The tables themselves are in 310.16 through 310.21. This change restores the table numbers used in the 2008 and earlier NEC editions. The parent text in this section indicates that the ampacities from the tables are modified by the rules in 310.15(A) through (F) and 310.12.

310.16 Ampacities of Insulated Conductors in Raceways, Cables, or Buried

The information that was in the headings of Tables 310.15(B)(16) through 310.15(B)(21), providing guidance on the conditions under which the listed ampacities for conductors applied, was relocated to this section.

314.16 Number of Conductors

A new sentence was added requiring that, in addition to the volume required for conductors and devices in a box, the box must also comply with the depth requirements of 314.24. More than four equipment grounding conductors can no longer be grouped together as “one of the largest conductors,” as indicated by the new language in subsection (B)(5).

314.17 Conductors That Enter Boxes or Conduit Bodies

The language in subsection (A) was revised to require openings through which conductors enter to be closed in a manner “identified for the application,” replacing the 2020 Code rule that required the closing device to be approved. Additionally, subsections (B) and (C) were merged and reorganized.

314.27 Outlet Box Requirements

The revised rule in subsection (C) requires ceiling outlet boxes installed in habitable rooms of dwelling units, where a ceiling fan may be installed, to be ceiling fan rated. An option not to install the fan-rated box was added where there is access to structural framing that will support a ceiling fan in the future.

314.29 Boxes, Conduit Bodies, and Handhole Enclosures to Be Accessible

The revision to this section expanded the original text into two new subsections without technical change.

312.5 Enclosures

A new exception was added for cable tray installations in subsection (C) to permit commonly used installation methods for conductors entering enclosures.

312.6 Deflection of Conductors

The rule regarding the deflection of conductors or the space necessary for conductors to be bent without damage was revised to clarify that it also applies to conductors in meter socket enclosures.

312.8 Overcurrent Device Enclosures

Subsection (B) was expanded to permit both power monitoring and control equipment to be installed in switch or overcurrent device enclosures.

320.23 In Accessible Attics or Roof Spaces

The change in subsection (A) clarifies that this rule does not apply where “pull down” stairs are used, and the cable might be installed exposed.

320.80 Conductor Ampacity

Language was added to subsection (A) requiring ampacity adjustment to be made in accordance with 310.15(C)(1) when more than two Type AC cables containing two or more current-carrying conductors in each cable are installed in contact with thermal insulation, caulk, or sealing foam without maintaining spacing between conductors.

330.80 Conductor Ampacities

The language added for Armored Cable was also incorporated into subsection (C), requiring ampacity adjustment for Type MC cable used in thermal insulation to be in accordance with 310.15(C)(1).

338.10 Uses Permitted

The installation methods for interior installations in subsection (B) were reorganized into a list format. A new rule regarding ampacity adjustment "in contact with thermal insulation" was added to both new list items to clarify the requirements for using Types SE and USE cable as feeders or branch circuits.

334.30 Securing and Supporting

The method of measurement from, and the length of excess cable between, the last means of cable support and the enclosure is now specified for Type NM cable.

340.10 Uses Permitted

Revisions were made to the list items regarding the permitted uses of Type UF cable.

340.12 Uses Not Permitted

A new Informational Note following 340.12(9) advises that the sunlight-resistant marking on the cable jacket does not apply to the individual conductors within the jacket unless they are identified as such.

336.2 Definition

The definition of Type TC cable was revised to specify that it contains an equipment grounding conductor.

336.10 Uses Permitted

Since Type TC cable offers limited physical protection for the conductors inside the cable assembly, its use was assumed to be restricted merely because of its "TC" designation. New language has alleviated this restriction somewhat. The rule regarding the use of TC-ER-JP was clarified to permit its use for branch circuits and feeders as well as exterior wiring.

342.10 Uses Permitted

New wording in subsection (E) clarifies that IMC is suitable for use where it is subject to severe physical damage.

342.14 Dissimilar Metals

This section was clarified to specify the types of fittings acceptable for use with stainless and galvanized steel IMC.

338.2 Definitions

The definition of "Service-Entrance Cable" was revised to make it clear that it has an overall covering. A new definition, "Service-Entrance Conductor Assembly," was also added.

344.10 Uses Permitted

Specific language in subsection (E) was added to permit RMC installation in areas subject to severe physical damage.

344.14 Dissimilar Metals

This section was clarified to specify the types of fittings acceptable for use with stainless steel RMC.

350.10 Uses Permitted

The permitted uses for LFMC were expanded to include areas subject to machine oils in list item (1), and a new list item (4) was added regarding the temperature rating of conductors.

350.12 Uses Not Permitted

The parent text was revised into a single sentence prohibiting the use of LFMC where it is subject to physical damage, and the list items were removed.

350.30 Securing and Supporting

The permission to use LFMC fittings as a means of support has been limited to installations permitted by the exceptions after subsection (A).

356.10 Uses Permitted

The permitted uses for LFNC were expanded to include areas subject to machine oils in list item (2), and a new list item (8) was added regarding the temperature rating of conductors used in LFNC.

358.10 Uses Permitted

A new subsection (E) was added to permit steel and stainless steel EMT to be installed where subject to physical damage.

380.12 Uses Not Permitted

A new list item (7) was added to this section.

392.10 Uses Permitted

The language was revised to clarify the use of single insulated conductors in cable trays.

392.18 Cable Tray Installations

The rule in subsection (H) was revised to clarify that the "over 600V" applies to the operating voltage of the system, not to the voltage rating of the conductors.

392.30 Securing and Supporting

A new list item was added to subsection (B), requiring cable ties used for securing and supporting cables and conductors in cable trays to be listed for the purpose.

392.44 Expansion Splice Plates

This change requires the use of expansion splice plates where necessary to compensate for expansion and contraction.

392.46 Bushed Conduit and Tubing

This section was expanded to provide guidance for protecting cables and conductors where they transition from the cable tray to raceways or into enclosures.

358.10 Uses Permitted

A new subsection (E) was added to permit steel and stainless steel EMT to be installed where subject to physical damage.

Chapter 4

EQUIPMENT FOR GENERAL USE

400.12 Uses Not Permitted

This section was revised to clarify the types of cords and cables to which the “uses not permitted” applies. The exception to (5) was expanded to include power-supply cords (extension cords) as well as flexible cords and flexible cables.

400.17 Protection from Damage

This rule was revised to replace “reduced” with “adjusted,” as that is the correct NEC term. Cords are subject to the same ampacity adjustments as other wiring methods.

402.3 Fixture Wire Types

A new type of fixture wire has been recognized by product standards and was added to this table.

404.9 General-Use Snap Switches, Dimmers, and Control Switches

This section was expanded to include dimmers and control switches. Subsections (A) and (B) were expanded and clarified, along with two of the three exceptions following (B).

404.10 Mounting of General-Use Snap Switches, Dimmers, and Control Switches

Switches must now be mounted flush to the box or finished surface, and their cover plates must completely cover the wall opening.

404.12 Grounding of Enclosures

The final sentence of this rule was changed to add a direct reference to the exceptions in 314.3.

404.14 Rating and Use of Switches

Switches must now be listed devices as indicated in the parent text. Additionally, subsection (A) was edited and subsection (E) was expanded.

404.2 Switch Connections

This rule was revised to better clarify the locations where light switches are required to have a neutral conductor run to the switch box.

404.4 Damp or Wet Locations

This section was edited to prohibit switches from being installed in tub spaces; the previous language only prohibited them from being installed within the tub itself.

404.7 Indicating

Changes to this rule clarify that the on/off indication for a switch or circuit breaker must be visible when accessing the external operating means.

406.2 Definitions

New parent text is part of the global reorganization of definitions throughout the Code.

406.3 Receptacle Rating and Type

Language was added to prohibit the use of reconditioned receptacles. The text in subsection (D) was clarified, and subsection (D)(2) now requires a provision to connect a metal faceplate to the equipment grounding conductor.

406.4 General Installation Requirements

Section 406.4(A) was revised to correlate with the rules in Article 210, and a new list item was added in subsection (D).

406.5 Receptacle Mounting

Section 406.5(G) was revised into a two-item list format, with new language added in list item (2).

406.7 Attachment Plugs, Cord Connectors, and Flanged Surface Devices

Additional language was added to specify that reconditioned attachment plugs, cord connectors, and flanged surface devices are not permitted.

406.9 Receptacles in Damp or Wet Locations

The prohibited locations for receptacles in bathrooms were expanded, and a new exception was added.

406.10 Grounding-Type Receptacles, Adapters, Cord Connectors, and Attachment Plugs

Three subsection titles were revised.

406.12 Tamper-Resistant Receptacles

Four list items were modified, and one list item was added.

408.3 Arrangement of Busbars and Conductors

Revisions to this section were minor and included no technical changes.

408.4 Field Identification

A change in subsection (A) now permits the required circuit directory to be located adjacent to the panel.

408.6 Short-Circuit Current Rating

This new rule requires switchboards, switchgear, and panelboards to have a short-circuit current rating not less than the available fault current, and the available fault current must be field-marked on the enclosure at the point of supply.

408.8 Reconditioning of Equipment

This new section addresses the reconditioning of panelboards, switchboards, and switchgear.

408.18 Clearances

A new subsection was added, along with two new list items that address side and rear access requirements to switchgear and panelboards.

408.23 Power Monitoring and Energy Management Equipment

This new section references the requirements of 312.8(B).

408.36 Overcurrent Protection

The exception to this rule that permitted panelboards not to have individual protection when used as service equipment with multiple service disconnects was deleted.

408.43 Panelboard Orientation

This new section prohibits a panelboard from being installed in a face-up position.

410.2 Definitions

The name of this definition was changed from "closet storage space" to "clothes closet storage space."

410.7 Reconditioned Equipment

This new rule prohibits the use of reconditioned luminaires, lampholders, and retrofit kits.

410.10 Luminaires in Specific Locations

Subsection (D) was revised into a list format with parent text. No technical changes were made, but the requirements for luminaires in the shower area were clarified.

410.16 Luminaires in Clothes Closets

The word "closet" was changed to "clothes closet" throughout this section.

410.22 Outlet Boxes to Be Covered

Additional wording clarifies that the entire opening around a lighting outlet box must be covered.

410.36 Means of Support

The title of this section was revised, the rule was reorganized into a list format, and a reference to 314.27(E) was added.

410.40 General

Revisions were made to require lighting and lighting equipment to be grounded by being connected to an equipment grounding conductor.

410.44 Methods of Grounding, Exceptions

An exception was deleted, and the remaining two were revised.

410.116 Clearance and Installation

A new subsection (C) was added to cover the installation and clearances of luminaires in fire-resistant construction.

410.118 Access to Other Boxes

This new section prohibits using luminaires recessed in ceilings, floors, or walls as the access point for outlet, pull, or junction boxes or conduit bodies unless the box is an integral part of the listed luminaire.

Part XVI Special Provisions for Horticultural Lighting Equipment

A new "Part XVI" was added to specifically address the unique requirements for horticultural lighting equipment.

411.4 Listing Required

The parent text was expanded to prohibit the reconditioning of listed low-voltage lighting systems or a low-voltage lighting system assembled from listed parts. Additionally, the language in subsection (B) was revised.

422.5 GFCI Protection

GFCI protection for appliances was relocated to this section, editorial revisions were made, and two new list items and a new Informational Note were added.

422.6 Listing Required

The listing requirement was clarified to apply to appliances supplied at 50V or higher.

422.10 Branch Circuits

The title and scope of this section were revised, and subsection (A) was clarified.

422.13 Storage-Type Water Heaters

The language in this section was revised to clarify that the branch-circuit conductors and branch-circuit overcurrent protective devices supplying storage-type water heaters with a capacity of 120 gallons or less must be rated at not less than 125 percent of the load.

422.16 Flexible Cords

Subsection (A) was split into two list items, and the list items in subsection (B) were reorganized.

422.19 Space for Conductors

This rule was clarified to state that the volume of the canopy and the outlet box must be combined when determining the amount of wiring space.

422.22 Utilizing Separable Attachment Fittings

This new section specifically permits the use of separable attachment fittings to support appliances.

422.31 Permanently Connected Appliance Disconnects

Sections 422.31(A) and (B) were revised to be consistent with other lockable disconnect rules in the NEC.

424.1 Scope

The scope statement was changed to reference “central heating systems” rather than “central systems” and was editorially revised for compliance with the NEC style manual.

424.4 Branch Circuits, Branch-Circuit Requirements

This section was revised to clarify that the reference is to individual branch circuits that serve “fixed” heating equipment.

424.19 Disconnecting Means

The language was editorially revised to be consistent with 110.25 and other lockable disconnect rules in the Code.

424.44 Electric Heating Cables in Concrete or Masonry Floors

The language in subsection (E) was revised to clarify that the GFCI protection required in this rule is in addition to any requirements in 210.8.

430.2 Definitions

A new definition of “Electronically Protected (as applied to motors)” was added.

430.32 Continuous-Duty Motors

The requirements of subsections 430.32(A)(2) and (B)(2) were expanded to include electronically protected motors as well as thermally protected motors.

430.99 Available Fault Current

Documentation of the available short-circuit current calculations must now be readily available to those who install and maintain motor control center equipment as well as those who inspect the equipment.

430.122 Conductor Sizing

A new Informational Note was added to subsection (A), and new subsections (B) and (D) were added.

430.130 Branch-Circuit Short-Circuit and Ground-Fault Protection

A new exception and Informational Note were added to subsection 430.130(A)(1).

440.9 Grounding and Bonding

This section has been revised for improved clarity.

440.10 Short-Circuit Current Rating

Revisions were made to subsections (A) and (B). The scope of the available fault current calculation has been expanded to include industrial control panels and motor controllers used with air-conditioning and refrigerating equipment.

440.32 Single Motor-Compressor

This section has undergone editorial revisions to clarify the requirements for conductor sizing.

445.6 Listing

A new subsection has been added, requiring stationary generators operating at 600V or less to comply with this section.

445.18 Disconnecting Means and Emergency Shutdown

The title has been updated to specify that this section applies to both the disconnection of the emergency generator and its emergency shutdown. Additionally, subsections (A), (C), and (D) have been revised to clarify the intent of this section.

450.9 Ventilation

This section has been expanded to include a requirement that the top horizontal surfaces of transformers must be marked to prohibit storage.

450.14 Disconnecting Means

The revision to this rule clarifies that a remote disconnecting means must be capable of being locked in the open position.

480.2 Definitions

The definition of "Storage Battery" has been revised.

480.4 Battery and Cell Terminations

A new subsection (D) has been relocated from 706.33 and added here without any changes.

480.7 DC Disconnect Methods

Subsection 480.7(B) was added. Information in subsection (C) was relocated from 706.30(B) with editorial changes. Section 480.7(F)(3) was expanded, and subsection (G), which includes two list items, was added.

480.10 Battery Locations

This rule was clarified to permit the use of listed fire exit hardware.

480.12 Battery Interconnections

The rules for interconnecting storage batteries were moved from 706.32 to this section.

480.13 Ground-Fault Detection

This section was revised and relocated from 706.30(D), with a change in the title.

Chapter 5

SPECIAL OCCUPANCIES

500.1 Scope—Articles 500 Through 503 Informational Notes

The Informational Note that preceded this section was relocated without change to follow 500.1 as Information Note No. 4.

500.4 Documentation

The title of this section was changed from "General" to "Documentation," and a new Informational Note was added.

500.5 Classifications of Hazardous Locations

Wording was added in 500.5(C)(1) to clarify the class and division of Group E combustible dusts.

500.7 Protection Techniques

An editorial change in the parent text clarifies the various protection methods permitted for different hazardous location classes where electrical and electronic equipment might be installed.

500.8 Equipment Involving Optical Radiation

A new subsection (G) was added to address the risk of ignition from sources of optical radiation (such as laser or LED sources).

501.105 Meters, Instruments, and Relays

A new exception was added to permit the use of cord-and-plug connections that are not listed for Class I, Division 2 locations in industrial establishments.

502.10 Wiring Methods

Language was added to clarify 502.10(B), and a new subsection was added.

502.150 Signaling, Alarm, Remote-Control, and Communications Systems; Meters, Instruments, and Relays

Subsection 502.150(B)(5) was added, allowing the use of cord-and-plug connections under certain conditions in Class II, Division 2 locations.

503.10 Wiring Methods

Both editorial and technical changes were made to this section, with the primary revision requiring cable tray systems to contain an equipment grounding conductor.

501.10 Wiring Methods

The language throughout 501.10(B)(1) was changed to clarify that both threaded and threadless fittings can be used with IMC and RMC in Class I, Division 2 locations. Other revisions were made, and a new list item (9) was added.

501.15 Raceway and Cable Seals

The language in this section was revised to clarify that standard conduit couplings are permitted between an enclosure that requires a seal and the sealing fitting.

511.1 Scope

The Informational Note referencing NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, was relocated to follow the scope statement.

511.3 Area Classification, General

Additional language and a new Informational Note were added to this section.

511.8 Underground Wiring Below Class I Locations

The title was revised to clarify that the use of IMC and RMC threaded fittings applies only to wiring installed below a Class I location.

511.12 Ground-Fault Circuit-Interrupter Protection for Personnel

This rule was expanded by referencing the requirements of 210.8(B).

517.16 Use of Isolated Ground Receptacles

New parent text from NFPA 99, Health Care Facilities Code, was added, and subsections (B)(1) and (2) were revised to improve clarity.

518.6 Illumination

This new section addresses illumination for working spaces around fixed service equipment, switchboards, switchgear, panelboards, or motor control centers installed outdoors where this equipment serves assembly occupancies.

514.1 Scope

The Informational Note referencing NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, was relocated to follow the scope statement.

514.3 Classification of Locations

Additional language and a new Informational Note were added to this section.

514.11 Emergency Electrical Disconnects

The requirement for the emergency disconnect to open the neutral as well as the phase conductors was restored.

525.20 Wiring Methods

Subsection 525.20(G) was revised to require protective matting to be secured to the walkway surface.

525.23 GFCI-Protection

Wording was added to subsection 525.23(A) to reference the requirements of 210.8(B).

Article 517 Health Care Facilities

The Informational Note referencing NFPA 99, Health Care Facilities Code, was relocated to follow the scope statement.

517.2 Definitions

New parent text was added to indicate that the definitions in Article 517 apply only within that article, and additions and changes were made to some of the definitions.

517.10 Applicability

A new list item (3) was added to subsection (B) to include additional areas not covered by the rules in Part II.

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

The title of this section was revised, and a new list item, 517.13(B)(1)(4), specific to metal faceplates, was created.

547.2 Definitions

The new parent text is part of the NEC style manual global change for 2020 regarding definitions. Additionally, the definition of “Equipotential Plane” was revised to clarify that it is very specific to agricultural buildings and applies only within this article.

547.5 Wiring Methods

Section 547.5(F) was clarified, and new language was added to subsection (G).

547.9 Electrical Supply to Buildings or Structures from a Distribution Point

This rule was revised to improve clarity and to indicate that there can be more than one electrical power distribution point.

550.13 Receptacle Outlets

New language was added in subsection 550.13(B) addressing the GFCI protection required in 210.8(A); additional language limits those requirements.

550.15 Wiring Methods and Materials

The previous prohibition on using aluminum conductors for mobile home branch-circuit wiring was deleted, and subsection 550.15(D) was revised.

Article 555—Marinas, Boatyards, Floating Buildings, and Commercial and Noncommercial Docking Facilities

This article was reorganized, includes several technical changes, and was expanded to incorporate the rules for floating buildings that were previously in Article 553.

555.1 Scope

Informational Notes following the scope text were added and renumbered.

555.2 Definitions

New definitions were added, and some were relocated to Article 100.

555.3 Electrical Datum Plane Distances

This new section provides electrical datum plane distance rules for floating piers, areas subject to tidal fluctuations, and areas not subject to tidal fluctuations.

555.4 Location of Service Equipment

This requirement was relocated from 555.7 and revised to include an additional reference to floating buildings.

555.5 Maximum Voltage

This rule was relocated from 555.4, and the maximum voltage for dock or marina service equipment was reduced.

555.7 Transformers

This section, formerly 555.5, was expanded, separated into two subsections, and editorially revised.

555.9 Boat Hoists

This new rule replaces the GFCI protection requirement for boat hoists that was previously found in 210.8(C).

555.13 Bonding of Noncurrent-Carrying Metal Parts

This rule was relocated here from 553.11 and requires all metal parts likely to become energized and in contact with water to be connected to the ground bus of the panelboard.

Part II: Marinas, Boatyards, and Docking Facilities

This new Part II of Article 555 covers specific electrical installation rules for marinas, boatyards, and docking facilities.

555.30 Electrical Connections

This section was divided into subsections, and the new 555.30(C) was added.

555.33 Receptacles

A new subsection (C) addresses replacing receptacles subject to the equipotential plane rules.

555.34 Wiring Methods and Installation

Section 555.34(B)(2) was modified to require compliance with only Part I of Article 225.

555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit-Interrupter (GFCI) Protection

This section was relocated from 550.3 and divided into two subsections. New Informational Notes were added to both.

555.37 Equipment Grounding Conductor

This section was relocated from 555.15. The title and subsection 555.37(A) were both revised to improve clarity.

Part III: Floating Buildings

This new Part III primarily consists of rules relocated from the now-deleted Article 553, with a new rule added.

590.4 General

The language in subsection 590.4(F) was revised to improve clarity, and two new exceptions were added to subsection (G).

590.6 GFCI Protection for Personnel

The title of subsection 590.6(B) was revised for clarity.

590.8 Overcurrent Protective Devices

This section was added to provide guidance for AHJs in the reuse of equipment for temporary applications.

Chapter 6

SPECIAL EQUIPMENT

600.2 Definitions

New definitions for "Host Sign," "Retrofit Kit, General Use," "Retrofit Kit, Sign Specific," and "Subassembly" were added to this section.

600.3 Listing

The parent text in this section was revised to require both listing and labeling.

600.4 Markings

The rule in subsection (D) was modified to permit the markings required by subsection 600.4(A) to be installed in a location not visible to the public.

600.5 Branch Circuits

Section 600.5(A) was clarified, and subsection (B) was added, requiring the disconnecting means to be marked to identify the equipment it disconnects.

600.6 Disconnecting Means

This rule was revised to state that conductors passing through a sign, and not disconnected by the sign disconnect, must be inaccessible to service personnel. Subsection (A)(4) requires first responder access to sign disconnects located remotely from the sign.

600.35 Retrofit Kits

This new section provides the installation requirements for retrofit kits.

620.6 GFCI Protection for Personnel

This rule was moved from subsection 620.85 to this location.

620.22 Branch Circuits for Elevator Car(s)

Section 620.22(A) was revised to clarify which types of equipment can be supplied by the lighting circuit and to specify the location of the overcurrent protective device if there is no machine room or machine space.

620.51 Disconnecting Means

A revision in subsection (A) now requires disconnects to be lockable only in the open position.

625.1 Scope

The scope was changed to include systems that permit bidirectional current flow.

625.2 Definitions

A definition for "Electric Vehicle Power Export Equipment (EVPE)" was added, and the definition for "Electric Vehicle Supply Equipment (EVSE)" was clarified.

625.5 Listed

Equipment covered by the scope of this article must now be listed.

625.41 Overcurrent Protection

This section was expanded to include bidirectional electric vehicle supply equipment (EVSE) and wireless power transfer equipment (WPTE).

625.42 Rating

This section was expanded to address equipment designs with adjustable input settings.

625.48 Interactive Systems

The term "electric vehicle supply equipment" was removed and replaced with the acronym EVSE.

625.54 GFCI Protection for Personnel

The GFCI requirement was expanded to apply to all receptacles installed for the connection of electric vehicle charging equipment.

625.60 AC Receptacle Outlets Used for EVPE

This new section covers alternating-current receptacles installed in electric vehicles intended to allow for the connection of off-board utilization equipment.

645.5 Supply Circuits and Interconnecting Cables

Revisions were made in this section to eliminate conflicts between the NEC and NFPA 75, Standard for the Fire Protection of Information Technology Equipment.

680.2 Definitions

The definition of "Fountain" was revised, and the term "Immersion Pool" was added.

680.3 Approval of Equipment

Revisions to this section clarify that all electrical equipment and products covered by Article 680 must be listed and installed in compliance with this article.

680.4 Inspections After Installation

The authority having jurisdiction can now require periodic inspection and testing of the pool system after installation.

680.5 Ground-Fault Circuit Interrupters

Additional wording clarifies that the GFCI requirements in Article 680 (unless otherwise noted) are in addition to those found in 210.8.

680.6 Bonding and Equipment Grounding

Revisions to this rule clarify that this section covers the requirements for bonding in addition to grounding electrical equipment.

680.7 Bonding and Equipment Grounding Terminals

Revisions to the section title and text clarified the intent of this rule.

680.11 Underground Wiring

This section was editorially revised to improve clarity and readability, with only a minor technical change.

680.14 Wiring Methods in Corrosive Environment

The definition of a corrosive environment was removed, leaving only the requirements for the wiring methods permitted in a corrosive location.

680.21 Motors (for permanently installed pools)

The GFCI protection of motors was expanded, and a new subsection requires GFCI protection to be provided for existing pump receptacles when replacing a pool pump motor.

680.22 Lighting, Receptacles, and Equipment

Revisions were made to clarify this rule, and new subsections were added.

680.23 Underwater Pool Luminaires

This section was editorially revised to clarify existing Code requirements regarding underwater wet-niche luminaires.

680.25 Feeders

A change in subsection (A) now permits the use of LFNC as a wiring method for feeders installed in a corrosive environment.

680.26 Equipotential Bonding

Two revisions were made to the perimeter bonding requirements.

Part III: Storable Pools, Storable Spas, Storable Hot Tubs, and Storable Immersion Pools

“Storable Immersion Pools” was added to the title.

680.31 Pumps

Section 680.31 was revised to clarify that the required grounding conductor is intended to be the equipment grounding conductor.

680.35 Storable and Portable Immersion Pools

This new section covers the electrical installation requirements for storable and portable immersion pools.

680.45 Permanently Installed Immersion Pools

The electrical installation requirements for permanently installed immersion pools are covered by this new section.

680.50 General

This general requirement was expanded to include "fountains intended for recreational use by pedestrians, including splash pads."

680.54 Grounding and Bonding

The titles and sections for bonding and grounding fountains were combined, expanded, clarified, and relocated to include bonding as well as grounding.

680.59 GFCI Protection for Permanently Installed Nonsubmersible Pumps

GFCI protection is now required for outlets that supply permanently installed nonsubmersible fountain pump motors.

680.80 General

This section was revised to require electrically powered pool lifts to comply with only Part VIII of this article, except where requirements in other parts are specifically referenced.

680.84 Switching Devices and Receptacles

This section was expanded to require receptacles for electrically powered pool lifts that operate above the low-voltage contact limit to comply with the requirements of 680.22(A)(3) and (A)(4).

690.2 Definitions

Some definitions were moved to Article 100, references to "PV" were removed, and some definitions were deleted altogether.

690.4 General Requirements

Section 690.4(B) was expanded to add three items to the list of equipment required to be listed or evaluated for the application. New language in subsection (F) addresses electronic power converters mounted in not readily accessible locations.

690.6 Alternating-Current Modules and Systems

This section was expanded to include ac systems as well as ac modules, clarifying that the wiring for these modules and systems are internal components and not subject to the requirements of Article 690.

690.7 Maximum Voltage

The revisions in this section were editorial in nature.

690.8 Circuit Sizing and Current

Section 690.8(A)(2), specifying the calculation of the maximum permitted input circuit currents to electronic power converters, was added. Editorial changes were made in subsection (B).

690.9 Overcurrent Protection

The parent text in subsection (B) was expanded to include electronic devices listed to prevent backfeed. The Informational Note following subsection (B)(2) was revised.

690.11 Arc-Fault Circuit Protection (Direct Current)

Changes were made to the exception to allow additional wiring methods to exempt PV output circuits from arc-fault circuit protection.

690.12 Rapid Shutdown of PV Systems on Buildings

Subsection (A) was revised to clarify that where an ac inverter output circuit originates within the array, it must be shut down by the rapid shutdown system. Subsections (B) and (C) were clarified.

690.13 Photovoltaic System Disconnecting Means

This section was expanded and clarified, and subsection (C) was moved to Article 705.

690.15 Disconnecting Means for Isolating Photovoltaic Equipment

The title and parent text were revised for clarity, and new language regarding isolating disconnects operating at over 30V was added.

Part IV: Wiring Methods and Materials

The title of this part was expanded to include both wiring methods and materials.

690.31 Wiring Methods

There were several changes in this section, including clarifications, editorial restructuring and relocation, and modified guidance for the adjustment of conductor ampacities.

690.33 Connectors

This rule was expanded to include mating connectors as an additional method of circuit interruption, and a new Informational Note follows new list item (3).

690.41 System Grounding

Ground-fault protection for systems that operate at 30V or less or 8A or less is no longer required. Subsection (B)(3) was added to require visible indication of ground faults.

690.43 Equipment Grounding and Bonding

The term “grounded” was replaced with language requiring the equipment to be connected to an equipment grounding conductor. A new subsection (D) addresses the bonding methods for PV systems over 250V to ground.

690.45 Size of Equipment Grounding Conductors

Equipment grounding conductors for PV system circuits are no longer required to be increased in size due to voltage-drop considerations.

690.47 Grounding Electrode System

The word "Auxiliary" was deleted from the title of subsection (B).

690.51 Modules and Alternating-Current Modules

Sections 690.51 and 690.52 were combined and simplified to remove marking requirements that are found in the listing standard.

690.53 DC PV Circuits

This section was editorially simplified and retitled to reflect the current NEC term of "PV" instead of "Photovoltaic." It was also revised to state that the required voltage label be both permanent and readily visible.

690.56 Identification of Power Sources

The rules for the identification of power sources for stand-alone systems were revised to reference the identification requirements found in Chapter 7 of the Code.

691.1 Scope

This article now applies to the installation of large-scale PV electric supply stations with an inverter generating capacity of at least 5,000 kW and not under an electric utility's control.

691.9 Disconnecting Means for Isolating Photovoltaic Equipment

The language in this section and its title were revised to clarify that the purpose of the PV disconnecting equipment is isolation.

691.11 Fence Bonding and Grounding

The title change recognizes that any metal fencing near the large-scale energy system may require bonding, not grounding.

694.22 Additional Provisions

New language in subsection (C) specifies that the wind electric system disconnect or manual shutdown button be located at a readily accessible exterior location for one- and two-family dwellings.

694.54 Identification of Power Sources

This section was editorially revised to reference the identification requirements found in other articles instead of duplicating the information here.

695.3 Power Source(s) for Electric Motor-Driven Fire Pumps

The exception to subsections (B)(1) and (2) was revised to permit a redundant electric fire pump with an independent power source instead of redundant power sources and an automatic transfer switch. Changes to subsection (C)(3) provide more specific requirements for the selective coordination of fire pump power supplies.

695.4 Continuity of Power

Section 695.4(B) now requires using the pressure maintenance (jockey) pump's full-load current instead of its locked-rotor current when selecting the proper overcurrent protective device(s).

695.6 Power Wiring

A new exception and Informational Note were added, and subsection (J) was revised to recognize that both cables and raceways are used for fire pump system connections.

695.10 Listed Equipment

This section was revised to prohibit the reconditioning of fire pump controllers and transfer switches.

Chapter 7

SPECIAL CONDITIONS

700.2 Definitions

The word “Emergency” was added to this term to clarify the luminaires to which this definition applies, and the definition was revised.

700.4 Capacity and Rating

The title of this section was changed to clarify it covers both the capacity and the rating of the emergency system. Subsections were revised or added.

700.5 Transfer Equipment

Subsection (A) was modified to remove redundant language and to prohibit the use of meter-mounted transfer switches. Subsection (C) was also revised.

700.6 Signals

Revisions were made to require indication that the emergency source, not just a battery, is carrying load. The system bonding jumper for multiple paralleled emergency sources is now permitted to be installed at an alternate location.

700.12 General Requirements

The multi-paragraph parent text for this section was shortened by moving portions of the information to two new subsections.

700.16 Emergency Illumination

Each paragraph of this rule was assigned a subsection letter and a title to make it easier to understand.

700.32 Selective Coordination, Informational Note and Informational Note Figure

A new Informational Note and related Figure were added to provide clarity on how emergency system overcurrent protective devices selectively coordinate with all supply-side OCPDs.

701.4 Capacity and Rating

This section was reorganized into three subsections.

701.5 Transfer Equipment

Transfer equipment must now be listed, the use of meter-mounted transfer switches is now prohibited, and a requirement regarding reconditioned equipment was added.

701.12 General Requirements

The parent text in this section was divided into ten subsections.

Part IV: Overcurrent Protection

Three sections in Part IV were renumbered to match the numbering sequence in Article 700, and a new Informational Note and related Figure were added to what is now 701.32.

702.2 Definition

The definition for “Optional Standby Systems” was revised to include stored power as well as on-site generated power.

702.4 Capacity and Rating

The title of subsection (A) was changed, and subsection (B) was revised to clarify that load calculations are an approved method of determining if an optional standby system can supply the load.

702.5 Transfer Equipment

This section was broken down into four subsections, one of which is a new rule permitting the use of meter-mounted transfer switches.

702.7 Signs

Subsection (A) was revised to coordinate with the new dwelling unit emergency disconnect required by 230.85.

705.2 Definitions

This definition was added to clarify that the conductors between power production equipment or a power source and the service equipment or distribution equipment are not feeder conductors.

705.6 Equipment Approval

This section was revised to clarify that when a field label is provided, it must be evaluated for interactive function.

705.10 Identification of Power Sources

The title of this section was changed to more directly inform the reader of the section content. It now requires a plaque or directory that is not installed at the service equipment to be at an approved readily visible location.

705.11 Supply-Side Source Connections

This new section addresses the requirements for connecting electric power production sources to the supply side of the service disconnecting means, as permitted by 230.82(6).

705.12 Load-Side Source Connections

The title and rules of 705.12 were revised to address only load-side connection requirements and reorganized for ease of use.

705.13 Power Control Systems

This new section addresses "multiple energy source situations" that can consist of utility, solar, generator, wind turbine, battery storage, and other sources.

705.20 Disconnecting Means, Source

The title was changed from "Disconnecting Means, Sources" to "Disconnecting Means, Source." In the parent text, the term "ungrounded conductors" was replaced with "conductors that are not solidly grounded."

705.25 Wiring Methods

This new section specifies the permitted wiring methods for interconnected electric power production sources.

705.28 Circuit Sizing and Current

The information in this new section was previously found in 705.60 and 705.95. The rules were relocated to apply throughout Article 705.

705.30 Overcurrent Protection

This section was revised to incorporate requirements that were in 705.65.

705.32 Ground Fault Protection

This now applies to GFPE devices installed in accordance with only 230.95.

705.40 Loss of Primary Source

The rules from 705.42 were combined with this section, so a single rule applies to the loss of the primary supply regardless of its type.

705.45 Unbalanced Interconnections

This rule was relocated from 705.100 and is specific to single-phase and three-phase installations.

Parts II and III

Parts II and III were deleted as part of the restructuring of Article 705.

705.50 System Operation

This section was clarified by replacing the phrase “operate as a separate microgrid system” with “as an isolated microgrid operating in island mode.”

705.60 Primary Power Source Connection

New language was added to clarify that the power source conductors connected to a microgrid are considered power source output conductors.

705.70 Microgrid Interconnect Devices (MID)

This was relocated from 705.170, and a list item was revised.

706.1 Scope

The scope was expanded to include temporary as well as permanent energy storage systems, and the size of the system to which the article applies was clarified.

706.2 Definitions

Definitions in this section were relocated, and a new one was added.

706.3 Qualified Personnel

References to other articles were deleted, and new language requiring an ESS to be installed and maintained by qualified persons was added.

706.4 System Requirements

This section was changed from "System Classification" to "System Requirements" and was expanded to specify marking requirements.

706.5 Listing

The title was changed from "Equipment" to "Listing" to better reflect the requirements in this section.

706.7 Maintenance

The requirements for disconnects that were in this section were moved to 706.15. This rule now specifies the maintenance requirements for energy storage systems.

706.9 Maximum Voltage

This new section addresses the maximum voltage of an energy storage system.

Part II: Disconnecting Means

The name of this part was changed.

706.16 Connection to Energy Sources

The rules in this section were relocated from 706.8 and clarified.

Part III: Installation Requirements

Part III was renamed to better group the installation requirements of this article.

706.21 Directory (Identification of Power Sources)

The directory and identification of power sources labeling and marking requirements for energy storage and stand-alone systems were relocated, retitled, and modified.

Part IV: Circuit Requirements

This part was renamed, and related sections were relocated.

706.30 Circuit Sizing and Current

Rules in this section were revised to clarify what the nameplate-rated circuit current is and that the inverter utilization output current is the continuous alternating-current output current rating.

706.31 Overcurrent Protection

A new exception was added to this section covering 100 percent rated overcurrent devices, and the requirements for overcurrent protection of ESS circuit conductors were revised.

710.15 General

The permitted capacity of premises wiring systems supplied by stand-alone or isolated microgrid power sources was clarified, and a new subsection (D) was added.

712.2 Definitions

Parent text was added to specify that these definitions apply only within this article, and the word "Functionally" was added to the definition of "Grounded."

712.10 Directory

A source directory and a building directory listing the location and/or source of all power sources and disconnecting means are now both required.

712.25 Identification of Circuit Conductors

Phase conductors 6 AWG or smaller can no longer be identified by marking tape, tagging, or other approved means.

712.34 DC Source Disconnecting Means

This rule was revised to reference 110.25.

712.65 Available DC Fault Current

The term "short-circuit current" was replaced with "fault current," and "maximum available short-circuit current" was replaced with "available fault current."

710.1 Scope

The scope was revised to clarify that this article covers electric power production systems that operate in island mode and installations not connected to an electric power production and distribution network.

710.6 Equipment Approval

The field labeling requirement was clarified to include both evaluation and labeling.

710.10 Identification of Power Sources

This new section requires a permanent plaque or directory to be installed at a building supplied by a stand-alone system.

710.12 Stand-Alone Inverter Input Circuit Current

This rule specifies maximum current and was relocated from 690.8(A)(4).

725.2 Definitions

New parent text specifies that the definitions in this article apply only within the article, and some were moved to Article 100.

725.3 Other Articles

This section was revised to clarify that all the rules in Article 725 apply and can be modified only by Article 300 if referenced in Article 725 as applied to Class 1, 2, and 3 circuits.

725.24 Mechanical Execution of Work, Informational Note

A new Informational Note was added explaining the effects of foreign substances on cable assembly insulation.

725.48 Conductors of Different Circuits in the Same Cable, Cable Tray, Enclosure, or Raceway

Class 1 circuits can now be installed with other circuits in a common enclosure (even if not functionally associated) if a barrier is installed to provide separation.

725.121 Power Sources for Class 2 and Class 3 Circuits

List item 5 was revised to specify a listed battery source or a battery source system identified as Class 2. Subsection (C) was expanded and clarified.

725.135 Installation of Class 2 Cables

Subsection (B) was revised to permit only cables (and not wires) to be installed in ducts specifically fabricated for environmental air. Subsection (E) was expanded to specifically permit the installation of innerduct within a metal raceway.

725.139 Conductors of Different Circuits in Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly

This section was clarified to state that conductors of Class 2 or 3 circuits can be installed in the same cable with communications circuits if the cable is a listed communications cable.

725.144 Transmission of Power and Data

Editorial changes and three new Informational Notes help clarify these installations. The title of Table 724.144 was revised, and a new exception was added.

760.3 Other Articles

Two new subsections were added.

760.24 Mechanical Execution of Work

This section was expanded to require compliance with all of 300.4.

760.121 Power Sources for Power-Limited Fire Alarm Circuits

The fire alarm branch-circuit disconnecting means is now specifically permitted to be secured in the “on” position.

Article 770 Informational Note

The Informational Note that followed the title of the article was deleted.

770.24 Mechanical Execution of Work

This section was expanded to require compliance with all of 300.4.

Chapter 8

COMMUNICATIONS SYSTEMS

There was a major restructuring of Chapter 8 during the 2020 revision cycle. Article 800 is now titled “General Requirements for Communications Circuits.” As the new title implies, it contains the general requirements for the other Chapter 8 articles, with the exception of Article 810, which stands on its own unless it specifically references rules in other articles.

The rules for “Communications Circuits” were relocated to the new Article 805. The general requirements that were in Articles 805, 820, 830, and 840 were moved to Article 800 to make the NEC easier to use. Since the requirements were nearly identical in the four articles, the Code-Making Panel believed it would be more user-friendly to have them in a single “general requirements” article.

You will now need to consult two different articles for a Chapter 8 installation: Article 800 for the general rules and one of the other four for the more specific ones. The rules in this chapter remain separate from the rest of the NEC, unless there is a specific reference to a Chapter 1 through 7 rule in a Chapter 8 article.

800.1 Scope

This article covers the general requirements for Chapter 8 installations.

800.2 Definitions

Definitions in Part I of Article 100 apply throughout Chapter 8, and those found in 800.2 apply only within Chapter 8.

800.3 Other Articles

Common information from the "xxx.3" sections of the other Chapter 8 articles, except Article 810, is now located here.

800.49 Metal Entrance Conduit Grounding

This rule was previously in Articles 800, 820, and 840. It was clarified and relocated here.

800.53 Separation from Lighting Conductors

The language was revised to clarify that communications cables and CATV cables must be separated from lightning conductors, not from each other. Two new Informational Notes were added.

800.100 Cable and Primary Protector Bonding and Grounding

Minor editorial changes were made, and this rule now applies to the bonding and grounding of all Chapter 8 installations, except those covered by Article 810.

800.110 Raceways, Cable Routing Assemblies, and Cable Trays

This section now applies throughout Chapter 8 and does not need to be repeated in each of its articles.

800.113 Installation of Wires, Cables, Cable Routing Assemblies, and Communications Raceways

These provisions were relocated from the communications circuits article with only editorial revisions and no technical changes.

800.154 Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies

This section combines and relocates the permitted cable types for Articles 805, 820, 830, and 840 into a single section without technical change.

800.179 Plenum, Riser, General-Purpose, and Limited Use Cables

The redundant requirements from Articles 805.179, 820.179, and 830.179 were moved here as general requirements.

805.93 Grounding, Bonding, or Interruption of Non-Current-Carrying Metallic Sheath Members of Communications Cables

The section title and language were revised to add the words “bonding” or “bonded.”

805.133 Installation of Communications Wires, Cables, and Equipment

This revision clarifies that where Class 2 and 3 circuits are in a communications cable, they remain classified as Class 2 or 3 circuits.

805.154 Substitutions of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies

This section now contains only the permitted substitutions of communications cables.

820.3 Other Articles

General references made to other articles are now found in 800.3 as part of Chapter 8’s reorganization.

820.44 Overhead (Aerial) Coaxial Cables

Apart from subsections 820.44(A) and (B), the requirements for overhead cables were relocated to 800.44.

820.100 Cable Bonding and Grounding

Most of the cable bonding and grounding requirements are now found in 800.100.

820.154 Substitutions of Listed CATV Cables

The application rules were relocated to 800.154, leaving just the cable substitution rules in this section.

810.21 Bonding Conductors and Grounding Electrode Conductors—Receiving Stations

Copper-clad aluminum was added to the list of permitted conductor types for bonding and grounding applications.

820.3 Other Articles

General references made to other articles are now found in 800.3 as part of Chapter 8's reorganization.

820.44 Overhead (Aerial) Coaxial Cables

Apart from subsections 820.44(A) and (B), the requirements for overhead cables were relocated to 800.44.

820.100 Cable Bonding and Grounding

Most of the cable bonding and grounding requirements are now found in 800.100.

820.154 Substitutions of Listed CATV Cables

The application rules were relocated to 800.154, leaving only the cable substitution rules in this section.