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TOP 20 2023 NEC CHANGES THAT IMPACT ELECTRICAL CONTRACTORS

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CONVENTION EDUCATION

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Scope

This presentation covers a number of changes in the 2023 National Electrical Code® in twenty categories.



Code-Wide Revisions

Reconditioned Equipment

- There are now several reconditioned equipment requirements in the NEC.
- The second section of some articles (XXX.2) is now reserved for any requirements that either permit or prohibit reconditioning of equipment that is covered by the article.



Code-Wide Revisions

Definitions

- **Article 100 now contains all definitions. It no longer has parts.**
- **Definitions are assigned to code-making panels based on the articles assigned to the panel and how closely the panel aligns with the definition. The responsible panel is indicated in each definition.**
- **Some definitions only apply to a single article. Where that is the case, the article number appears toward the end of the definition.**



210.19-Codewide Revisions

Conductors – Minimum Ampacity and Size

- **New branch circuit voltage limits have been added for ac and dc circuits.**
- **Section 210.19 now applies to branch circuits not exceeding 1,000 volts ac and 1,500 volts dc.**
- **The requirements for branch circuits exceeding 1,000 volts ac and 1,500 volts dc have been relocated to new Article 235.**



210.19-Codewide Revisions



Courtesy of Bill McGovern, City of Plano, TX

Articles

New, Deleted, and Relocated Articles and Revised Article Titles for the 2023 NEC

- **Nine articles are new**
- **Three articles were deleted**
- **Seven articles had title revisions**
- **Four articles were relocated.**



Articles

Medium- and High-Voltage Requirements

- **New medium- and high-voltage moved to an article ending in 5.**
- 235 Branch Circuits, Feeders, and Services Over 1000 Vac, 1500 Vdc, Nominal
- 245 Overcurrent and Overvoltage Protection for Systems Rated Over 1000 Volts ac, 1500 Volts dc, Nominal
- 305 General Requirements for Wiring Methods and Materials for Systems Rated Over 1000 Volts ac, 1500 Volts dc, Nominal



Articles

Medium- and High-Voltage Requirements (continued)

- 315 Medium Voltage Conductors, Cable, Cable Joints, and Cable Terminations
 - 395 Outdoor Overhead Conductors over 1000 Volts
 - 495 Equipment Over 1000 Volts ac, 1500 Volts dc, Nominal
- **Articles 395 and 495 were relocated from 399 and 490, respectively, for consistency with the numbering scheme.**



Article 235-Articles

Branch Circuits, Feeders, and Services Over 1000 Vac...

- A new Article 235 has been created on branch circuits, feeders, and services over 1,000 volts ac or over 1,500 volts dc.
- This change is intended to improve usability and clarity.
- Corresponding requirements have been deleted from Articles 210, 215, and 230.



Article 235-Articles



Article 245-Articles

Overcurrent Prot. Sys. Rated Over 1000 Vac, 1500 Vdc

- A new Article 245 has been created on overcurrent protection for systems rated over 1,000 volts ac and 1,500 volts dc.
- This new article will replace previous requirements for systems over 1,000 volts, which were located in Articles 240 and 490.
- This is one of several new articles that are intended to enhance the *NEC's* coverage of medium- and high-voltage applications.



Article 245-Articles



Courtesy of Michael J. Johnston

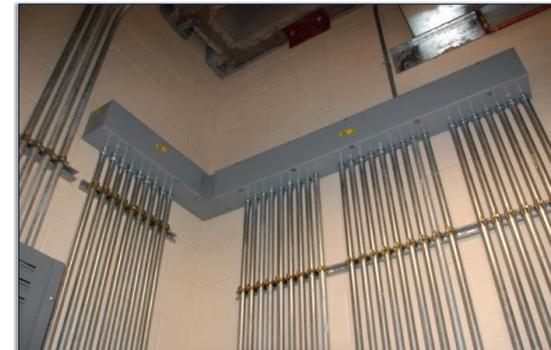
Articles 300 and 305-Articles

Limitations

- Article 300 was reorganized to limit it to systems rated 1,000 volts ac, nominal, or less and 1,500 volts dc, nominal, or less.
- Medium- and high-voltage requirements have been moved to the new Article 305.
- The bulk of Article 305 came from Part II of Article 300.



Article 300-Articles



Courtesy of Bill McGovern, City of Plano, TX

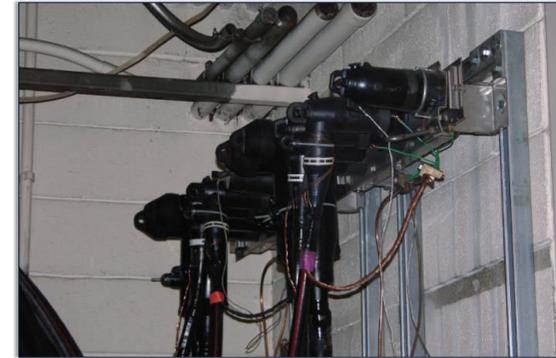
Article 315-Articles

Medium Voltage Conductors and Cables

- Article 311 has been relocated to become Article 315, consistent with the numbering scheme for medium-voltage articles.
- The title and scope of Article 315 have been expanded to include cable joints and cable terminations.
- The scope of this article for dc cables is limited to cables rated 2,001 through 2,500 volts.



Article 315-Articles



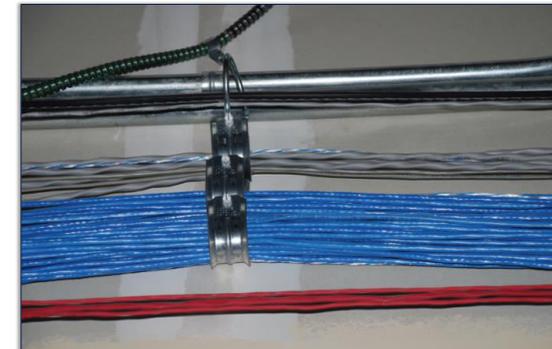
Article 722-Articles

Cables for Power-Limited Circuits

- A new Article 722 covers cable requirements for Class 2 and 3 power-limited circuits, power-limited fire alarm circuits, and Class 4 fault-managed power systems.
- Part I provides general requirements for power-limited circuit conductors and cables.
- Part II covers listing requirements for conductors and cables.



Article 722-Articles



Courtesy of Michael J. Johnston

Article 724-Articles

Class 1 Power-Limited Circuits

- Class 1 circuit requirements have been moved from Article 725 to the new Article 724.
- Class 1 circuits are now limited to not more than 30 volts and 1,000 volt-amperes.
- The remote control and signaling circuits that are not power-limited are no longer considered to be Class 1 circuits.



Article 724-Articles



Article 725-Articles

Class 2 and 3 Power-Limited Circuits

- Article 725, which now only applies to Class 2 and 3 power-limited remote control and signaling circuits.
- General requirements for wiring of Class 2 and 3 circuits have been relocated to new Article 722, Cables for Power-Limited Circuits.
- The relocated material includes substitution tables, abandoned cables, mechanical execution of work.



Article 725-Articles



Article 726-Articles

Class 4 Power Systems

- A new Article 726, Class 4 Power-Limited Circuits, has been created to provide requirements for fault-managed power systems.
- Fault-managed power systems monitor the circuit for faults and control power delivery to ensure that fault energy is limited.
- Class 4 circuits can have a peak output voltage of 450 volts dc line-to-line or 225 volts line-to-ground.



Article 726-Articles



Courtesy of Michael J. Johnston

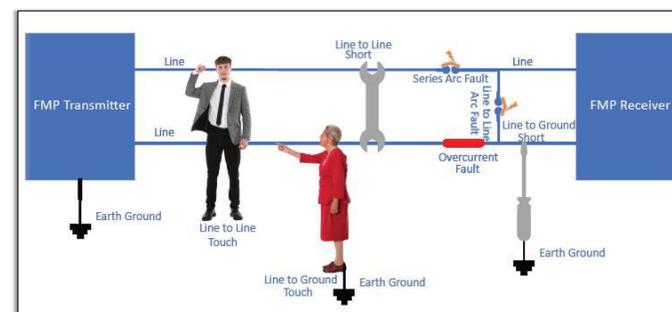
Article 100-Articles

Definition of Class 4 Definitions

- Class 4 power systems will be used with equipment used in 5G Internet communications systems.
- A Class 4 Power System is a fault-managed system that relies on a continuous electronic handshake to ensure proper operation.
- Class 4 power systems can supply up to 450 volts dc line-to-line or 225 volts dc to ground to provide power and control of equipment.



Article 100-Articles



Courtesy of Cisco

Article 810-Articles

Antenna Systems

- The title of Article 810 has been changed from “Radio and Television Equipment” to “Antenna Systems.”
- This article covers all radio receiving equipment.
- The only radio transmitting equipment covered by Article 810 is transmitters used for amateur radio and citizens band radio.



Article 810-Articles



Courtesy of David Nelson, WV1H

Article 100-Commissioning

Definition of Commissioning

- Revised definition to provide consistency in a commissioning process.
- Commissioning was previously covered only in Article 708, Critical Operations Power Systems.
- New commissioning requirements are found in 700.3, 701.3, and 706.7.



Article 100-Commissioning



Courtesy of PDE Total Energy Solutions

706.7-Commissioning

Commissioning and Maintenance

- Section 706.7 has been expanded to require that energy storage systems be commissioned before being placed into service.
- This does not apply to ESS installations in one- and two-family dwellings.
- An informational note was added to point to *NFPA 855* for information on commissioning of energy storage systems.



706.7-Commisioning



Courtesy of Michael J. Johnston

110.16(B)-Personnel Safety

Service Equipment and Feeder Equipment

- Section 110.16(B) now includes feeder and service equipment.
- The requirement now requires an arc flash warning label.
- The threshold for a required label has been lowered from 1,200 amperes to 1,000 amperes.
- The requirements for the content of the label have been deleted because they are included in 110.21(B).



110.16(B)-Personnel Safety

⚠ WARNING	
Arc Flash & Shock Hazard Appropriate PPE Required	
Date Label was Applied	_____
Nominal System Voltage	_____
Available Fault Current	_____
Service Overcurrent Device Clearing Time	_____
Arc Flash Boundary _____	
At least one of the following: _____ or	
(1) Incident Energy _____ at working distance of _____	or
Arc Flash PPE Category _____	
(2) Minimum arc rating of clothing _____	_____
(3) Specific level of PPE _____	_____

Yellow Highlights indicate arc-flash warning label requirements in the NEC



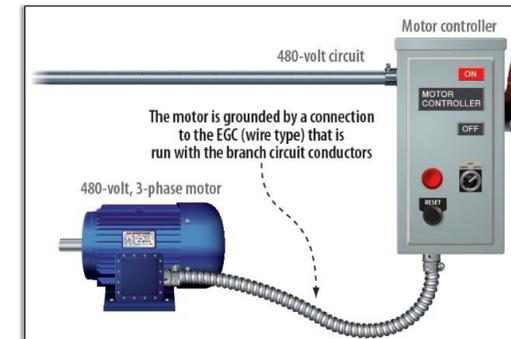
110.22(A)-Personnel Safety

Identification of Disconnecting Means, General

- Disconnecting means are required to be legibly marked to indicate their purpose, unless located and arranged to make the purpose evident.
- The marking must include the identification and location of the circuit source that supplies the disconnecting means, unless located and arranged to make the identification of the circuit source evident.



110.22(A)-Personnel Safety



110.26 -Personnel Safety

Width of Working Space

- The requirement that open equipment doors must not impede entry or egress to the working space was relocated to the main rule in 110.26.
- Relocation of the open equipment door requirement to 110.26 means that it now applies to all equipment, not just large equipment.
- Access or egress is impeded if simultaneously-opened equipment doors restrict access to less than 24 inches wide or 6 ½ feet high.



110.26-Personnel Safety



215.15-Personnel Safety

Barriers

- *NFPA 70E* establishes the need for an electrically-safe work condition.
- In the 2020 *Code*, the requirements for barriers in panelboards, switchboards, and switchgear were relocated to 230.62(C).
- This section was added to apply panelboards, switchboards, switchgear, and motor control centers supplied by feeders or transformer secondaries.



215.15-Personnel Safety



225.41-Personnel Safety

Emergency Disconnects

- One- and two-family dwelling units that are supplied by a feeder now require an emergency disconnect that is installed in an outdoor, readily accessible location.
- If more than one disconnect is required, they must be grouped.
- The disconnecting means must be marked "EMERGENCY DISCONNECT" on the outside front of the enclosure. The label must be red with white lettering.



225.41-Personnel Safety



408.4-Personnel Safety

Descriptions Required

- The title of 408.4 has been changed to “Descriptions Required.”
- Every circuit and circuit modification is required to be legibly and permanently described with its clear, evident, and specific purpose.
- All switchboards, switchgear, and panelboards supplied by a feeder in other than one- and two-family dwellings must be marked to indicate the location of the power source.



408.4-Personnel Safety



110.3(A)-Cyber Threats

Examination

- Cyber attacks are an increasing threat.
- Section 110.3(A)(8) now requires the evaluation of cyber security for network-connected life-safety equipment.
- An informational note was added that references standards for including the IEC 62443 series of standards and UL standards on cyber security, including UL 2900 and UL 5500.



110.3(A)-Cyber Threats



240.6(D)-Cyber Threats

Remotely Adjustable Trip Circuit Breakers

- Remotely adjustable circuit breakers are permitted to have an ampere rating that is equal to the adjusted current setting.
- Access through a local nonnetworked interface or through a networked interface where the circuit breaker and software are identified as evaluated for cybersecurity or the network has a documented cybersecurity assessment.
- Two informational notes reference cybersecurity standards and recognized methods of commissioning to identify cyber threats.



240.6(D)-Cyber Threats



Article 100-Outlets, Receptacles

Definition of Attachment Fitting, Weight Supporting

- This definition was revised to better describe the function of WSAF.
- The WSAF is a recognized component of a listed luminaire or fan.
- The combination of the WSAF and WSCR facilitate the modular replacement of luminaires and paddle fans.
- NEMA WD6 recognizes WSAF configurations.



Article 100-Outlets, Receptacles



Courtesy of SKYX Platforms

Article 100-Outlets, Receptacles

Definition of Receptacle, Weight-Supporting Ceiling

- Weight-supporting ceiling receptacles are contact devices that mate with a weight-supporting attachment fitting to make an electrical connection and to support the weight of luminaires or paddle fans.
- A WSCR that is listed for fan support can also support luminaires without fans, while a WSCR that is listed for luminaire support will reject a paddle fan.



Article 100-Outlets, Receptacles



Courtesy of SKYX Platforms

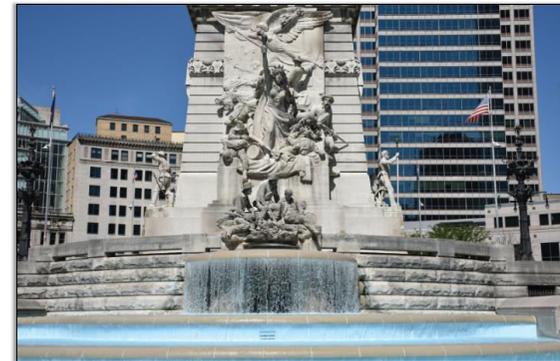
Article 100-Outlets, Receptacles

Definition of GFCI, Special Purpose

- A new definition was added for Special Purpose Ground-Fault Circuit-Interrupter.
- SPGFCIs are used on circuits with voltage greater than 150 volts to ground.
- Traditional GFCIs are also known as Class A GFCIs. Special purpose GFCIs are either Class C, D, or E GFCIs.



Article 100-Outlets, Receptacles



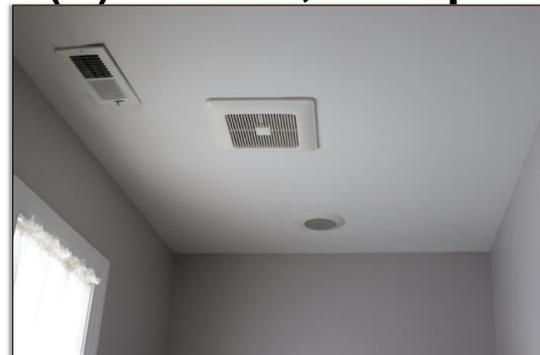
210.8(A)-Outlets, Receptacles

Dwelling Units

- GFCI requirements for kitchens now apply to all kitchen receptacles.
- GFCI requirements apply to any area of a dwelling unit with permanent provisions for food preparation, drink preparation, or cooking.
- Receptacles in bathroom exhaust fan assemblies that are not readily accessible do not require GFCI protection.



210.8(A)-Outlets, Receptacles



210.8(B)-Outlets, Receptacles

Other Than Dwelling Units

- GFCI protection is required for kitchens, food and beverage preparation and food serving areas, and any other preparation or food/beverage serving area where there is also cooking.
- A new requirement for GFCI protection of cord-and plug-connected fixed or stationary appliances has been added.
- A new GFCI requirement was added for receptacles within 6 feet of aquariums, bait wells, and similar open aquatic vessels or containers.



210.8(B)-Outlets, Receptacles



210.8(F)-Outlets, Receptacles

GFCI Protection for Personnel-Outdoor Outlets

- Section 210.8(F) applies to all outdoor outlets other than those covered by 210.8(A), Exception No. 1, rated 150 volts or less to ground, and 50 amperes or less.
- If equipment supplied by one of the specified outlets is replaced, the outlet will now be required to be GFCI protected.
- Exception No. 2 on HVAC equipment is effective on Sept. 1, 2026.



210.8(F)-Outlets, Receptacles



210.52(C)-Outlets, Receptacles

Countertops and Work Surfaces

- A new exception was added to 210.52(C)(1) for countertops with wall space where a receptacle cannot be installed in the required wall space to permit installation as near as practicable.
- Receptacles are no longer required for island and peninsular counter tops. If not installed, provision is required for a future installation.
- Receptacles are permitted to be in or on but not below countertops.



210.52(C)-Outlets, Receptacles



Courtesy of ABB Inc.

220.110-Outlets, Receptacles

Receptacle Loads – Health Care Facilities

- Demand factors for receptacle loads in health care facilities have been added in 220.110, which is located in the new Part VI, Health Care Facilities.
- These new requirements are based on receptacle load data from health care facilities.
- These demand factors are referenced in 517.22.



220.110-Outlets, Receptacles



406.12-Outlets, Receptacles

Tamper-Resistant Receptacles

- Tamper-resistant receptacles are now required in all dwelling units, boathouses, mobile homes, and manufactured homes, including their attached and detached garages.
- Requirements for tamper-resistant receptacles in medical facilities and other types of residential facilities have been revised and clarified.
- Tamper-resistant receptacles are not required for single or duplex receptacles in the space designated for a specific appliance.



406.12-Outlets, Receptacles



Courtesy of Eaton Corporation

680.5-Outlets, Receptacles

GFCI and SPGFCI Protection

- The first sentence of 680.5 was deleted because it described the types of devices used for GFCI protection, which was not needed.
- Some GFCI requirements in Article 680 were consolidated into 680.5.
- A new 680.5(C) has been added to address ground-fault protection of receptacles and outlets on single- and 3-phase circuits exceeding 150 volts to ground.



680.10-Outlets, Receptacles



110.17-Reconditioning

Servicing and Maintenance of Equipment

- Servicing must be performed by a *qualified person* trained in servicing and maintenance of equipment.
- Servicing and maintenance must be performed in accordance with the manufacturer's instructions and applicable industry standards or as approved by the AHJ.
- Replacement parts must be verified to applicable product standards.



110.17-Reconditioning



Courtesy of Burlington Electrical Testing

110.20-Reconditioning

Reconditioned Equipment

- Equipment is generally permitted to be reconditioned, unless prohibited elsewhere in the *Code*.
- Requirements are provided for parts and sources of information.
- If listing is required, the equipment must be listed or field-labeled as reconditioned. If listing is not required, it must be listed or field-labeled as reconditioned in accordance with the manufacturer's instructions.



110.20-Reconditioning



517.6-Reconditioning

Patient Care-Related Electrical Equipment

- A new requirement indicates that patient care-related equipment is not subject to the reconditioning requirements in the *Code*.
- Patient care-related equipment is subject to a recertification process after it is reconditioned.
- Patient care-related equipment is also subject to recommissioning or recertification when it is relocated.



517.6-Reconditioning



Courtesy of Michael J. Johnston

215.18-Surge Protection

Surge Protection

- During the 2020 *Code* cycle, a new surge protection requirement was added for dwelling unit services in 230.67 (expanded for 2023).
- Surge protection is now required for feeders that supply dwelling units, dormitory units, guest rooms and guest suites of hotels and motels, and patient sleeping rooms of nursing homes and limited care facilities.



215.18-Surge Protection



225.42-Surge Protection

Surge Protection

- During the 2020 cycle, a new surge protection requirement was added for dwelling unit services in 230.67 (expanded for 2023).
- Surge protection is now required for outside feeders that supply dwelling units, dormitory units, guest rooms and guest suites of hotels and motels, and sleeping rooms of nursing homes and limited care facilities.
- Still required if SPD protection is upstream at the feeder or service.



225.42-Surge Protection



230.67-Surge Protection

Surge Protection

- Surge protection will now be required to be provided in service equipment for dormitories, guest rooms and guest suites of hotels and motels, and sleeping areas of nursing homes and limited care facilities.
- Surge protective devices must have a nominal discharge current rating of not less than 10 kA.



230.67-Surge Protection



242.9-Surge Protection

Indicating

- Surge protective devices are required to provide an indication that they are operating properly.
- A surge protective device can be damaged by a high-level surge, even if it has protected the equipment.
- Previously, the occupant may not have known that the SPD operation may have damaged it, precluding future protection.



242.9-Surge Protection



220.53-Electric Vehicles

Appliance Load – Dwelling Units

- Section 220.53 permits a demand factor of 75% to the nameplate rating of four or more appliances fastened in place rated at least ¼ horsepower or 500 watts.
- EVSE is not permitted to have a reduced demand factor.
- The EVSE branch circuit to be sized for continuous duty loads.



220.53-Electric Vehicles



220.57-Electric Vehicles

Electric Vehicle Supply Equipment (EVSE) Load

- A new requirement has been added for sizing the load for electric vehicle supply equipment.
- The load must be sized at 7,200 volt-amperes or the nameplate rating of the equipment, whichever is larger.
- An informational note was added to reference 625.42, which provides the requirement for sizing an EVSE circuit.



220.57-Electric Vehicles



220.70-Electric Vehicles

Energy Management Systems (EMSs)

- Listed energy management systems are permitted to limit the load on feeders or services. Upon malfunction, the load must be disconnected.
- Access to the settings must be restricted to authorized personnel.)(3).
- Marking requirements include the maximum current setting, the date of the calculation and setting, and identification of current-limited loads and sources.



220.70-Electric Vehicles



625.49-Electric Vehicles

Island Mode

- EVPE and EVSE with a power export function is now permitted to be part of an interconnected power system that operates in island mode.
- Some electric vehicle installations can function as optional standby power systems.
- The rest of the connected system must be capable of operating in island mode.



625.49-Electric Vehicles



240.4(B)-OCPDs

Overcurrent Devices Rated 800 Amperes or Less

- Conductors must be protected in accordance with their ampacity. Where the ampacity does not equal a standard OCPD rating, the next standard size (not to exceed 800 amperes) is permitted.
- An adjustable trip OCPD is permitted to be used as long as the setting does not exceed the next standard rating size above the ampacity.
- The means to adjust the setting of the adjustable trip mechanism must have restricted access in accordance with 240.6(C).



240.4(B)-OCPDs



Courtesy of Michael J. Johnston

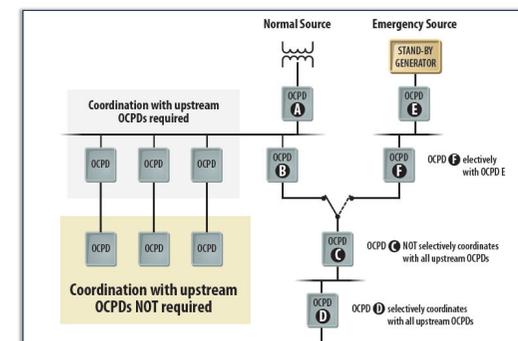
240.11-OCPDs

Selective Coordination

- If there are feeders connected to the service that have loads that are not required to be coordinated, the uncoordinated loads could be capable of opening the service OCPD.
- If feeders are connected to a service that have loads that are required to be selectively coordinated, those feeders are also required to be selectively coordinated.



240.11-OCPDs



250.20-Grounding

Alternating-Current Systems to Be Grounded

- Alternating current systems are now required to be grounded in accordance with 250.20, unless prohibited elsewhere in the Code.
- A new informational note has been added to point to specific examples of applications where grounding is prohibited.
- 250.20(D) was revised to recognize that impedance grounded systems do not have a neutral conductor.



250.24-Grounding

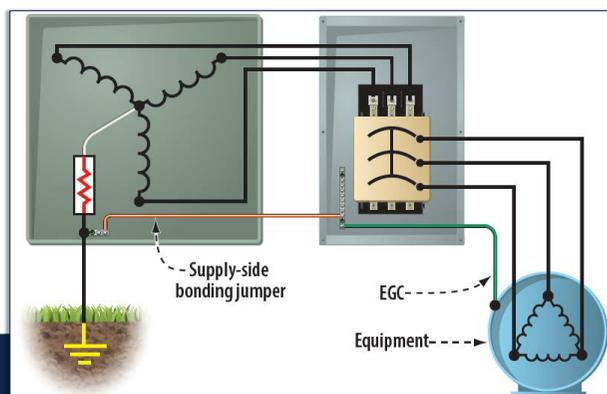
Grounding of Service-Supplied AC Systems

- The term *high impedance grounded system* is now changed to *impedance grounded system*.
- The conductor that connects to the neutral point through an impedance is an impedance grounded conductor.
- Parallel grounded service conductors in two or more parallel raceways are required to be connected in parallel.



250.24-Grounding

REVISION



314.27(C) & (E)-Wiring Methods

Outlet Boxes, Ceiling-Suspended (Paddle Fans)

- Outlet boxes used as the sole support of ceiling-suspended (paddle) fans are now required to be marked on the inside of the box..
- 314.27(C)(2) was simplified to recognize boxes that provide direct access through the box to structural framing capable of supporting a paddle fan, without the need to remove the box.



314.27(C) & (E)-Wiring Methods



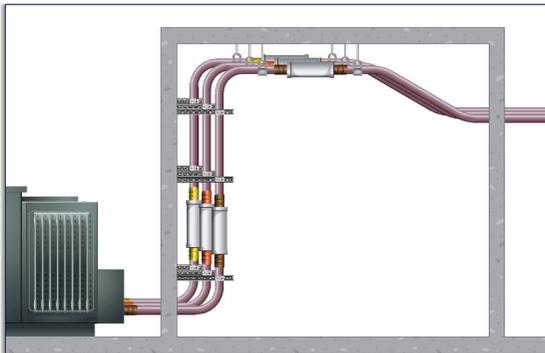
Article 369-Wiring Methods

Insulated Bus Pipe (IBP)/Tubular Covered Conductors

- The new Article 369 covers Insulated Bus Pipe (Type IBP).
- IBP is a cylindrical solid or hollow conductor with a solid insulation system having conductive grading layers and a grounding layer embedded in the insulation that is provided with an overall insulation or metal material. IBP is required to be listed.
- IBP is permitted to be used in wet or damp locations if listed for wet or damp locations. It must not be accessible to unqualified persons.



Article 369-Wiring Methods



Article 371-Wiring Methods

Flexible Bus Systems

- A new Article 371 on Flexible bus systems, which are assemblies of flexible bus with associated fittings to secure, support, and terminate.
- Flexible bus is permitted for services, feeders, and branch circuits. It is permitted indoors, or outdoors if identified for outdoor use.
- Flexible bus is permitted to be used exposed or behind access panels that are not used for air handling..



Article 371-Wiring Methods



Courtesy of Ward Judson, nVent

430.6-Motors and Generators

Conductor Ampacity and Motor Rating Determination

- The values used for determining the ampacity of conductors, the ampere rating of switches, and the ampere rating of branch-circuit short-circuit and ground-fault protection of motors are based on table values from Article 430, Part IV.
- New 430.6(A)(2)(3) was added to permit the use of nameplate current ratings for motors that exceed the motor sizes in Part XIV.



430.6-Motors and Generators



Courtesy of Michael J. Johnston

430.52(C)-Motors and Generators

Rating or Setting

- 430.52(C)(3) now recognizes the higher available inrush current for Design B premium efficiency motors protected by an instantaneous-trip circuit breaker.
- 430.52(C)(6) now recognizes the higher inrush current for Design B premium efficiency motors supplied by a self-protected combination motor controller.
- Design B premium efficiency motors are mandated in federal energy efficiency regulations.



430.52(C)-Motors and Generators



Courtesy of Michael J. Johnston

445.6-Motors and Generators

Listing

- Previously, stationary generators rated 600 volts or less were required to be listed.
- This section now requires all generators to be listed. One-of-a-kind custom manufactured generators are permitted to be field labeled.
- UL 2200, Stationary Generator Assemblies, now also covers medium-voltage generators.



445.6-Motors and Generators



500.4-Hazardous Locations

Documentation

- The documentation required by 500.4 now includes areas that have been determined to be unclassified.
- The documentation of the hazardous location must also be available to the authority having jurisdiction.
- The edition dates have been deleted for many of the referenced standards.



500.4-Hazardous Locations



500.5(D)-Hazardous Locations

Class III Locations

- Class III, Division 1 location-combustible fibers/flyings can be present in the air under normal conditions in quantities to produce explosive or ignitable mixtures.
- Class III, Division 2 location-nonmetal combustible fibers/flyings can be released through the abnormal operation of equipment, but will not interfere with equipment operation.



500.5(D)-Hazardous Locations



500.7-Hazardous Locations

Protection Techniques

- A reference to Chapter 9, Table 13 on protection techniques added.
- Section 500.7(E) was revised to delete references to entire articles.
- New protection techniques were added to this section, including electrical resistance trace heating, impedance heating, enclosed break, non-sparking, sealed, and other techniques that are identified for use in hazardous (classified) locations.



500.7-Hazardous Locations



Chapter 9, Table 13- Hazardous Locations

Equipment Suitable for Hazardous Locations

- Tables 505.9(C)(2)(4) and 506.9(C)(2)(3) were deleted.
- These tables were used for equipment selection where the zone classification systems are used.
- Chapter 9, Table 13 can be used for both the traditional class/division classification system and the zone classification system.



Chapter 9, Table 13- Hazardous Locations



511.2-Hazardous Locations

Other Articles

- A new Section 511.2 was created with a table that points to requirements in Articles 500, 501, and 505.
- The table is intended to simplify the use of either the traditional class/division classification system or the zone classification system.
- Similar tables have been added to 512.2, 513.2, 514.2, 515.2, and 516.2.



511.2-Hazardous Locations



Article 512-Hazardous Locations

Cannabis Oil Equipment and Cannabis Oil Systems

- A new Article 512 has been created on cannabis oil equipment and cannabis oil systems using flammable materials.
- Flammable materials are used to extract cannabis oil, including butane, ethanol, hexane, pentane, propane, and LPG.
- Article 512 provides detailed classification diagrams to help to evaluate hazardous areas.



Article 512-Hazardous Locations



518.2(A)-Occupancies

Examples

- Casinos and gaming facilities have been added to the list of examples of assembly occupancies that are covered by Article 518.
- Casinos can have transient crowds of people hovering over machines and table games.
- Many casinos also have entertainment to retain customers at the machines.



518.2(A)-Occupancies



410.190 through 197-Lighting and Signs

Provisions for Germicidal Irradiation Luminaires

- A new Part XVII on germicidal radiation luminaires has been added..
- Luminaires intended to emit germicidal radiation are required to be listed and must be installed in accordance with the manufacturer's instructions.
- Germicidal luminaires are not permitted in dwellings, unless listed and identified for dwellings.



410.190 through 197-Lighting and Signs



600.5-Lighting and Signs

Branch Circuits

- The last sentence of 600.5(A) was converted into an exception that exempts some entrances, corridors, and hallways.
- A second exception was added that permits the branch circuit to supply other loads that are directly related to the control of the sign.
- Section 600.5(D)(2) now permits enclosures integral to the sign that are listed and labeled as electrical enclosures to be used as pull or junction boxes for up to 600 volts.



600.5-Lighting and Signs



690.12, Exception-PV Systems

Rapid Shutdown of PV Systems on Buildings

- Section 690.12 establishes requirements for rapid shutdown of PV systems on buildings.
- A new exception exempts non-enclosed detached structures, such as those that provide parking shade, carports, and solar trellises.
- The exception aligns with requirements for firefighter rooftop access in the building and fire codes.



690.12, Exception-PV Systems



700.3-Power Supplies

Tests and Maintenance

- The permanent connection point for the temporary generator must be located outdoors.
- The switching means, including the interlocks, are required to be listed to prevent inadvertent interconnection of power sources.
- A permanent label must be field-applied at the permanent connection point that indicating the system voltage, maximum load, and short-circuit current rating of the load-side equipment.



700.3-Power Supplies



700.11-Power Supplies

Wiring, Class-2-Powered Emergency Lighting Systems

- Section 700.11 permits Class 2 emergency lighting systems that could use power over ethernet technology or low-power LED luminaires.
- These are directly-controlled luminaires and must comply with 700.24.
- In addition to other separation requirements, Class 2 emergency circuits must be separated from nonemergency Class 2 circuit conductors. If bundled, they must be bundled separately.



700.11-Power Supplies



700.32-Power Supplies

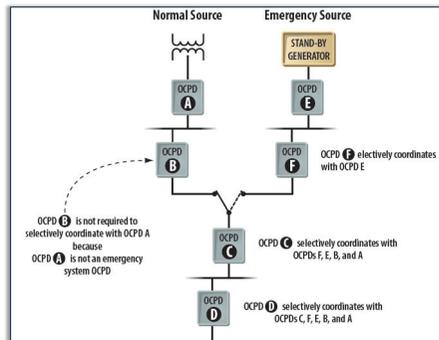
Selective Coordination

- Selective coordination of emergency systems is required to ensure overcurrent protective device operation does not affect other loads.
- The text has been revised by adding “load-side” to ensure that coordination applies upstream and downstream.
- New text states that if OCPDs are replaced, modified, deleted, or added, coordination must be reevaluated.



Courtesy of Electronic Theatre Controls Incorporated

700.32-Power Supplies



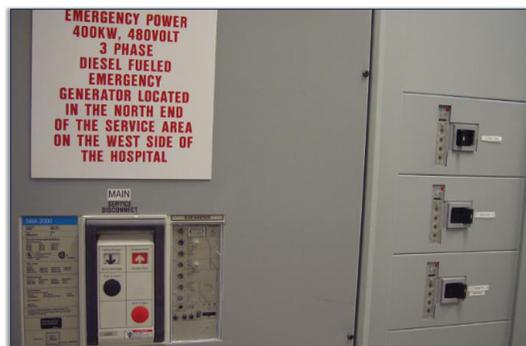
705.10-Power Supplies

Identification of Power Sources

- The identification requirements have been reorganized into list format.
- The plaques, labels, or directories are now required to indicate the emergency telephone numbers of off-site entities that service the installation.
- A reference was added to *NFPA 1: Fire Prevention Code*, which provides installer information.



705.10-Power Supplies



705.80 through 705.82- Power Supplies

Interconnected Systems Operating in Island Mode

- A new Part III has been added to provide requirements for operating an interconnected electric power production source in island mode.
- The three categories of operation are automatic load management, manual load management, and no-load management.
- Operation in island mode requires voltage and frequency to be controlled within limits.



705.80 through 705.82- Power Supplies



300.26-Limited Energy

Remote-Control and Signaling Circuits Classification

- Class 2 and 3 power-limited remote-control and signaling circuits remain in Article 725.
- Class 1 power-limited remote-control and signaling circuits were relocated to the new Article 724.
- Non-power-limited remote-control and signaling circuits are governed by the requirements of Chapters 1 through 4 of the Code.



300.26-Limited Energy



725.31-Limited Energy

Safety-Control Equipment

- If damage to Class 2 and 3 power-limited safety-control equipment can result in a direct fire or life safety hazard, the power-limited circuit must be installed in accordance with 724.31.
- Such circuits are no longer permitted to be reclassified as Class 1, but are required to be installed using Class 1 wiring methods.
- Reclassifying the wiring as Class 1 would require recertification of the source and load equipment as Class 1 equipment.



725.31-Limited Energy



Courtesy of Michael J. Johnston

Style Manual

NEC Style Manual Changes

- A new version of the style manual was issued in 2020.
- Text was simplified to avoid long paragraphs and long sentences by placing complex requirements into a list format.
- Many of the changes improved readability, but did not change the meaning of the code



90.1-Style Manual

Scope

- Article 90 now has a scope that provides the scope of Article 90, rather than the scope of the Code.
- The material previously found in 90.1 has been combined with 90.2, which is now titled "Use and Application."
- This change provides consistency and clarity but does not make any technical change to the Code.



90.1-Style Manual

Article 90 Introduction

90.1 Scope

This article covers use and application, arrangement, and enforcement of this Code. It also covers the expression of mandatory, permissive, and nonmandatory text, provides guidance on the examination of equipment and on wiring, planning, and specifies the use and expression of measurements.

90.1 Purpose.

(A) Practical Safeguarding-

The purpose of this Code is the practical safeguarding of persons and property from hazards arising from the user of electricity. This Code is not intended as a design specification or an instruction manual for untrained persons.

(B) Adequacy.

...



90.2-Style Manual

Use and Application

- Section 90.2 has a new title: Use and Application.
- All previous text in Section 90.1 has been blended into a reorganized 90.2
- The titles of 90.2(C) and (D) have been changed to accommodate the reorganization.



90.2-Style Manual

90.2 Scope Use and Application

- (A) Practical Safeguarding (Formerly 90.1(A))
- (B) Adequacy (Formerly 90.1(B))
- (C) Installations Covered (Formerly 90.2(A))
- (D) Installations Not Covered (Formerly 90.2(B))
- (E) Relation to Other International Standards (Formerly 90.1(C))
- (F) Special Permission (Formerly 90.1(D))



Article 100-Style Manual

Article 100 Reorganization

- Article 100 has been consolidated into an article that is not divided into parts.
- All of the definitions from other articles have been relocated into Article 100.
- The XXX.2 sections of various articles no longer contain definitions.
- If a term had multiple uses, it has been modified to facilitate each use..



Article 100-Style Manual

Article 100 Definitions

Part I- General
Part II- Over 1000 Volts, Nominal
Part III- Hazardous (Classified) Locations

This definition is extracted from the definitions chapter of *NFPA 99* (3.3.30). In most other NFPA documents, definitions are numbered.

Equipment Branch.

A system of feeders and branch circuits arranged for delayed, automatic, or manual connection to the alternate power source and that serves primarily 3-phase power equipment. (99:3.3.30) (517) (CMP-15)

This definition only applies within Article 517.

Assigned Code-Making Panel

The format of many defined terms were edited to comply with the new *NEC Style Manual*. To assist in electronic searching, some defined terms appear in parentheses as it would be found in the document.

Overcurrent Protective Device, Branch-Circuit, (Branch-Circuit Overcurrent Protective Device)
A device capable of providing protection for service, feeder, and branch circuits and equipment over the full range of overcurrents between its rated current and its interrupting rating. (CMP-10)



110.12-Style Manual

Mechanical Execution of Work

- The terms *neat* and *workmanlike* were replaced with *professional* and *skillful*.
- This editorial change uses more descriptive and gender-neutral terms.
- The informational note change is simply editorial.



110.12-Style Manual



110.14(A)-Style Manual

Terminals

- The requirement that terminal connections be “thoroughly good” has been replaced with the term *mechanically secure*.
- The text was revised to clarify that terminal connections must provide a good electrical connection.
- Requirements for connection methods for certain equipment, are the responsibility of the panel that covers that equipment.



110.14(A)-Style Manual



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