Mike Holt Enterprises, Inc. Overview of the 2020 NEC Changes

(Two-Day Program, 16 Hours, Live Seminar)

Course Description

The goal of this class is to identify those significant changes and provide explanation and analysis to help the student understand the rules, their impact, and their practical application. This class brings you an accurate, in-depth coverage of the most important 2020NEC Code changes and how they may affect current and future projects. This dynamic presentation translates the very technical language of the NEC into everyday electrician's language to ensure a safe Code-compliant system that is designed, installed, and inspected to meet the hundreds of significant changes contained in the 2020 NEC.

Day 1
8:00-10:00 am

The Numbers

Public Inputs - 3,730
Public Comments to Public Inputs - 1,930
First Revisions - 1,400
Second Revisions - 634
Correlating Revisions - 73

New Articles

- Article 242 Overvoltage Protection (280 and 285)
  Article 311 Medium Voltage Conductors and Cables
- Article 337 Type P Cable (Drilling Rig Cable)
- Article 800 General Requirements for Communications

Purpose of the National Electrical Code, 90.1

- Protection Against Fires
- Protection Against Electric Shock or Electrocution

Chapter 1 General

Article 100 Definitions

- **Definitions, 100.** The 2020 revision cycle globally addressed definitions throughout the Code. Many definitions in ".2 sections" of an Article were relocated to Article 100.
- **Definitions, 100.** Article 100 now contains three parts.
  - Part I, General
  - Part II, Over 1,000V
  - Part III, Hazardous (Classified) Locations

Article 110—Requirements for Electrical Installations

- **Installation and Use, 110.3(B).** Revision makes it clear that equipment that is listed, labeled, or both be installed in accordance with the instructions included in the listing or labeling.
- **Conductor Material , 110.5.** Informational Note text regarding copper-clad aluminum conductors moved into the rule.
- **Terminal Connection Torque, 110.14(D).** Revision requires the use of an approved means to torque terminations and three Informational Notes added.
- **Identification of Disconnect Means, 110.22.** The disconnecting means now requires the identification of the source that supplies the circuit disconnecting means.

10:00-12:00 pm

Chapter 2 – Wiring and Protection

Article 210—Branch Circuits

- **GFCI Protection, 210.8.** Revisions are many and include clarifications, expansions to existing rules, and a few new items.
- **Dwelling Units, 210.8(A).** Requirements were expanded for GFCI protection of receptacles rated 125V through 250V.
- **Indoor Damp and Wet Locations, 210.8(A)(11).** Receptacles in an indoor damp or wet location now must have GFCI protection.
- **Other Than Dwelling Units, 210.8(B).** All 125V through 250V receptacles supplied by single-phase branch circuits rated 50A or less or three-phase branch circuits rated 100A or less with a voltage of 150V or less to ground must now have GFCI protection.
- **Indoor Damp and Wet Locations, 210.8(B)(6).** Receptacles in an indoor damp or wet location now must have GFCI protection.
- **Specific Appliances, 210.8(D).** The requirement for outlets that supply dwelling unit dishwashers to have GFCI protection was moved to 422.5(A)(7) in Article 422-Appliances, and 210.8(D) was repurposed to cover “Specific Appliances.”
- **Equipment Requiring Servicing, 210.8(E).** GFCI protection is now required for all receptacles required by 210.63 for a/c and service equipment.
- **Outdoor Outlets, 210.8(F).** GFCI protection is now required for outlets supplying equipment such as HVAC units at dwelling units including hard-wired equipment.
- **Arc-Fault Circuit-Interrupters, 210.12.** The AFCI protection requirements for branch circuits have been expanded to include guest rooms and guest suites.
- **Equipment Requiring Servicing , 210.63.** The receptacle requirements of 210.64 for servicing of equipment have been combined into 210.63.
- **Meeting Rooms, 210.65.** This rule was relocated from 210.71 and clarified to indicate the number and location of the required receptacle outlets.

12:00-1:00 pm - LUNCH

1:00-3:00 pm

Chapter 2 – Wiring and Protection continued…

Article 230—Services

- **Service Equipment Barriers, 230.62(C).** Text related to the service equipment barriers from 408.3(A)(2) was relocated to a new subsection (C) and revised.
- **Surge Protection, 230.67.** New section requiring installation of a surge-protective device (SPD) for all dwelling unit services.
- **Number of Service Disconnects, 230.71.** A service is required to have only one disconnecting means; except as permitted in 230.71(B).
- **Connections on the Supply Side of Service, 230.82.** Emergency dwelling unit disconnect required by 230.85 and meter-mounted transfer switches are now permitted on the supply side of the service disconnect.

Article 240—Overcurrent Protection

- **Location in Circuit, Feeder Taps, 240.21(B).** The change here is intended clarify that you can originate a tap on the breaker termination point or at any point on the load side of the feeder overcurrent device.

Article 242—Overvoltage Protection

- **Overvoltage Protection, Article 242.** Former Article 280 – Surge Arresters Over 1,000V and Article 285 – Surge Protective Devices (SPD's), have been combined and relocated into this new Article.

3:00-5:00 pm

Chapter 3—Wiring Methods and Materials

Article 300—General Requirements for Wiring Methods and Materials

- **Conductors, 300.3.** Language added to ensure that when connections, taps, or extensions are made from paralleled conductors, all conductors from each phase and or neutral are included in the connection.
- **Protection Against Physical Damage, 300.4(G).** Subsection reorganized into a list format (1) through (4) covering the use of listed metal fittings with smoothly rounded edges, insulated fittings, and threaded hubs.
- **Raceways Exposed to Different Temperatures, 300.7.** The rule in the subsection (A), was revised to require the use of an "identified" sealant that's safe for the conductors and the raceway itself, and to correlate with the language in 225.27.

Article 310—Conductors for General Wiring

- **Single-Phase Dwelling Services and Feeders, 310.12.** The dwelling service feeder conductor sizing table from Annex D now resides in this new section.
- **Ampacities of Insulated Conductors, Table 310.16.** Ampacity Table 310.15(B)(16) was relocated to this section.

Article 312—Cabinets

- **Overcurrent Device Enclosures, 312.8.** Subsection (B) now permits both power monitoring and energy management equipment to be installed in a cabinet containing overcurrent protection devices or cutout box containing switches.
- **Outlet Box Requirements, 314.27.** The rule in (C) for ceiling outlet boxes in dwelling units, was revised to require a box rated for fan support in some cases.

Day 2

8:00-10:00 am

Chapter 4 – Equipment for General Use

Article 404 – Switches

- **Switches Controlling Lighting Loads, 404.2(C).** The wording in this rule was changed from "or rooms suitable for human habitation or occupancy" to "habitable rooms and occupiable spaces" to clarify that both dwelling and non-dwelling occupancies require a neutral conductor at the light switch location.

Article 406 – Receptacles

- **Receptacles Under Sinks, 406.5(G)(2).** New item (2) "Under Sinks" prohibits receptacles installed in a face-up position under a sink.
- **Receptacles in Damp or Wet Locations, 406.9.** The prohibited locations for receptacles for in bathrooms has been expanded and a new exception was added to permit the installation of receptacles in small bathrooms.
- **Tamper-Resistant Receptacles, 406.12.** Four of the existing list items, (1), (2), (4), and (7) in this section, were modified and an eighth list item was added.

Article 408 Switchboards and Panelboards

- **Panelboard Orientation, 408.43.** This new section prohibits a panelboard from being installed in a face-up orientation.

Article 422 – Appliances

- **GFCI Protection, 422.5.** There were editorial revisions to the text of subsection (A) and the list items were expanded to include sump pumps and dishwashers.
- **Flexible Cords, 422.16.** The general requirements for flexible cords were split into two list items without any technical changes.
- **Built-in Dishwashers and Trash Compactors, 422.16(B)(2).** Because the dishwasher receptacle must be in a space adjacent to the dishwasher, this rule now requires protection for the flexible cord when it passes through an opening.
- **Permanently Connected Appliance Disconnect, 422.31.** Subsections revised so that the rules are consistent with, "capable of being locked in the open position" per 110.25.

10:00-12:00 pm

Chapter 4 – Equipment for General Use Continued…

Article 440 – Air-conditioning and Refrigeration Equipment

- **Grounding and Bonding, 440.9.** Requirements for metallic raceways that use "compression type" fittings were edited for clarity.

Article 450 – Transformers

- **Disconnecting Means, 450.14.** When the disconnecting method for a transformer is located remotely, the disconnect must be lockable in the "open" position consistent with 110.25.

Chapter 5 – Special Occupancies

Article 517—Health Care Facilities

- **EGC for Receptacles and Fixed Equipment, 517.13.** The title of the section was revised specifying its reference to the equipment grounding conductor.
- **Metal Face Plate, 517.13(B)(1)(4).** This new list item specifies that a metal face plate secured to a metal yoke or strap of a receptacle or to a metal outlet box using metal screws is connected to an EGC.

12:00-1:00 pm - Lunch

1:00 – 3:00 pm

Chapter 6 – Special Equipment

Article 625—Electric Vehicle Power Transfer System

- **Scope, 625.1.** Both the title and scope of this article were changed to include systems which permit bidirectional current flow of electricity.
- **Definitions, 625.2.** New definitions for electrical vehicle power export equipment (EVPE) and clarification that some electric vehicles can supply electrical loads external to the vehicle.
- **Rating, 625.42.** This rule addresses the EVSE (electric vehicle supply equipment) supply circuit rating with adjustable input settings.

Article 680—Swimming Pools, Spas, Hot Tubs, Fountains, and Similar Installations

- **Definitions, 680.2.** Several new definitions were added or relocated in this section and an informational note pertaining to corrosive environments was added.
- **Corrosive Environment, 680.2.** This rule was relocated here from 680.14(A) and a new Informational Note provides additional information about the corrosion hazard.
- **Fountain, 680.2.** The term fountain was expanded to include "splash pads."
- **Immersion Pool, 680.2.** This new definition was added to clarify that an immersion pool is used for ceremonial or ritual immersion of users and is designed and intended to have its contents drained or discharged.
- **Splash Pad, 680.2.** The term "splash pad" was added to the definitions and indicates it is a type of fountain making all the requirements for fountains apply to splash pads.

- **Approval of Equipment, 680.3.** This rule was relocated here from 680.4 and requires that electrical equipment and products covered in Article 680 be installed in compliance with this article.
- **Inspections After Installation, 680.4.** This new section allows the authority having jurisdiction to require periodic inspection and testing of the pool system.
- **Ground-Fault Circuit Interrupters, 680.5.** This new rule makes it clear that the GFCI requirements in Article 680 are in addition to those found in section 210.8.
- **Bonding and Equipment Grounding Terminals, 680.7.** The terms grounding and bonding were reversed in the title and within the section text to reflect that most of these terminals are really bonding terminals and not grounding terminals.
- **Wiring Methods in Corrosive Environment, 680.14.** The rule now requires wiring methods used in a corrosive environment be listed and identified for such use such as…
- **Motors for Permanently Installed Pools, 680.21.** 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.
- **Lighting, Receptacles, and Equipment, 680.22.** Clarifications were made throughout this section and new subsections were added with requirements for receptacles located in pool equipment rooms and electrical equipment which is not associated with the pool.
- **Pool Equipment Room, 680.22(A)(5).** This new rule requires a GFCI protected 15A or 20A, 125V receptacle on a general-purpose branch circuit in the pool equipment room for the use of service personnel.
- **Other Equipment, 680.22(E).** The new rule requires that “other equipment," be located at least 5’ horizontally from the inside wall of a pool unless separated from the pool by a permanent barrier.

3:00-5:00 pm

Chapter 6 – Special Equipment Continued…

- **Equipotential Bonding, 680.26.** Revisions to this rule were made to the perimeter bonding requirements and the rules for metal fittings were clarified.
- **Perimeter Surfaces, Copper Ring, 680.26(B)(2)(b).** This revised rule permits a copper ring to be used where the steel reinforcing cannot be used for the required bonding. It also now permits exothermic welding as an option to listed splicing devices where connections need to be made.
- **Perimeter Surfaces, Copper Grid, 680.26(B)(2)(c).** This new rule permits a copper grid to be used where the steel reinforcing cannot be used for the required bonding and permits exothermic welding as an option to listed splicing devices.
- **Permanent Spas, Hot Tubs, Immersion Pools, Part IV.** “Immersion Pools” was added to the “Part IV” title to reflect that their requirements are here.
- **Fountains and Splash Pads, General 680.50.** Fountains in general must comply with Parts I and V of this article. Fountains that have water common with a pool and the newly added “splash pads” must also comply with the requirements of Part II including the bonding requirements.

- **Grounding and Bonding, 680.54.** The title and sections for the bonding and grounding of "Fountains," have been combined, expanded, clarified, and relocated to better include bonding as well as grounding.
- **GFCI Protection Nonsubmersible Pumps, 680.59.** Submersible fountain pumps required GFCI protected by the requirements of 680.51(A). New rule requires GFCI protection for nonsubmersible pump motors rated 250V or less and 60A or less.

Chapter 8 – Communications Systems

Article 800—General Requirements for Communications Systems. The general requirements contained in Chapter 8 were relocated to a new Article 800.

Article 805—General Requirements for Communications Circuits. The previous Article 800 rules were relocated to a new Article 805.

Course Objectives/Goals:

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Method of Course Presentation

This program is presented in a live classroom and is accompanied by books for each student and PowerPoint slides with hundreds of illustrations and graphics.

Course Instructors:

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