National Electric Code (NEC) Update

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Codes in Context

Industry Safety Codes and Standards
- NFPA – NEC & NFPA 70E
- IEEE NESC
- GO-95…GO128…GO165
- OSHA 1910.268/269
- Internal M&Ps
  - GRs and UL Listings
- Joint Use Agreements (JUA)
- UL
- GRs/SRs
- ATIS
- etc......
Purposes and Scope

Inside and On Buildings ➔ NEC

**Purpose** = The practical safeguarding of persons and property from hazards arising from the use of electricity
- NFPA = Fire Protection

**Scope** – covers installation of electrical and communications (electrical and fiber optic) conductors, equipment and raceways, for
- Public & private premises (homes, residences, buildings, similar properties) ... inside
- Focus is on load side of the demarcation point
- Out of Scope (Exemption) = Exclusive control of Utility (Communications, Power....)

Not a Design Manual

OSP ➔ NESC

**Purpose** = The practical safeguarding of persons, utility facilities, and affected property during the installation, operation, and maintenance of electric supply and communication facilities.
- IEEE = Electrical Safety of Public and Workers

**Scope** - covers supply and communication facilities and associated work practices employed by a electric supply, communications, or railway in the exercise of its functions as a utility.
- Facilities = lines, equipment, and specified infrastructure (e.g., poles, distribution plant sub-stations, vaults...)
- The NESC covers similar systems under the exclusive control of the utility and being worked by qualified persons, such as those associated with an industrial complex or utility interactive system.

Not a Design Guide or Instruction Manual
NEC Adoption as of 1/1/2021

2020 NEC® - 9
2017 NEC® - 27
2014 NEC® - 8
2008 NEC® - 2
County/Municipality NEC® regulation only - 4
NEC (NFPA 70) Representation

Correlating Committee (CC) and 3 NEC Technical Committees (CMPs)

- **CMP 1** – Purpose and Scope (Arts. 90, 100 and 110)
- **CMP 5** – Grounding (Arts. 200, 250, 280 and 285)
- **CMP 16** – Communications Systems (Arts. 770, 800-through-840)
- **NEC CC** - Oversight responsibility for the entire Code-making process, i.e., ensuring due process and correlating the technical committee (CMP) actions

[Monitor and track other CMPs and Articles as needed – e.g., CMP13 (Article 480 - battery systems), CMP3 (Article 725 - Class 2/3 circuits, Chapter 9 tables), CMP4......]
NEC Schedule with Pandemic Modifications

- Code Making Panels (CMPs) First Draft Meetings - Virtual
  - More frequent and extensive Task Group Meetings used
- Formal Ballots from CMP Meetings – Feb-March 2021
- Virtual CC Meeting April 2021
- Public Comment Closing Date: August 19, 2021
- Second Draft Meetings - October-November 2021
  - Face-to-Face Meeting Vs Virtual = uncertain at this time
- Second Draft Report Posting Date: March 21, 2022
- Targeted publishing date remains August 2022 for the 2023 NEC
Highlights from First Draft Meetings - 1

**CMP1 and CMP16 (January 2021)**

**Independence of Chapter 8, Communications Systems** has been retained – Proposals to remove the independence in 90.3 were rejected because of our presentations to CMP1 and to the reorganization of Chapter 8 to address any perceived clarity and use-ability concerns

- Article 800 with general requirements applicable to Articles 805, 820, 830 and 840
- New Article 805 created for specific requirements for communications circuits
- Chapter 8 reorganized to simplify, eliminate redundancies

**Utility Exemption in 90.2B4** has been retained – Proposals to remove were rejected

- Exclusion from coverage of communications equipment under the exclusive control of communications utilities remains intact

**Consolidation within Article 800** and clarification of relationships with articles in Chap. 7 validated

- Common definitions, OSP cabling, installation and Listing added to Article 800
Highlights from First Draft Meetings - 2

CMP16 and CMP3 (January 2021)

- **Harmonization between NEC and NESC** has been maintained for the service drop cables and outside (OSP) plant equipment that provide communications services to customer premises.

- **New definitions** for *communications circuit* and *communication utility* along with new/revised Sections 800.3, 800.48, 800.47 taken together clarify when an installation belongs in Chapter 8 and when it belongs in Chapter 7.

- **New Article 726 – Class 4 (CL4) Power Systems** was accepted for First Draft to cover the installation of wiring and equipment of Fault Managed Power (FMP) system.

- Nominal Voltage - competing definitions all contain “…The operating voltage of the cell or battery may vary above or below this value” which covers communications industry needs.

- **Energy Storage Systems** - Batteries – Updates to Art. 480 deals with stationary standby batteries used to support dc loads and UPS systems serving communications equipment and services.
Highlights from First Draft Meetings - 3

Grounding Highlights - CMP5/CMP16 (Dec 2020 - Jan 2021)

• Intersystem Bonding Terminations (IBT) 250.94 rules modified slightly for clarity
• Copper-Clad Steel Grounding Conductors - Chapter 8 in 800.100A2 and 810.21A has permitted uses under “other corrosion-resistant conductive material” language for communications applications
  – Article 250 does not currently permit these conductors for grounding of ac power circuits (as yet)
• Use of Water Piping as Grounding Means for communications applications relegated to least preferred in list for communications purposes.
Highlights from First Draft Meetings - 4

General Observations (Jan 2021)

- **Editorial** - There were extensive editorial, grammatical, format and style changes made to the NEC to meet the new “NEC Style Manual”. If all these changes pass ballot and Public comment periods, Code users will see many word, format and sentence structure changes that do not change the technical intent of the rules.
  - “where” vs “if”…. “in accordance with” instead of “per”

- **Cybersecurity** – Concerns on cybersecurity were acknowledged but the NEC was not considered the appropriate vehicle to address security issues.
Ongoing Interactions
State Adoptions------AHJ discussions
Local Variations in Regulations........Harmonization with NESC/Other Codes

March 2021
First Draft Ballots

Oct-Nov 2021
Public Comment
Review Meetings

2021 - 2022
NEC 2023 settled

Design – Engineering Operational M&Ps
Product Listings
Industry Standards -- Functional Performance Specifications
GRs, ATIS,..
RELATED INDUSTRY EFFORTS

NFPA 70E
Standard for Electrical Safety in the Workplace
2018

NFPA 780
Standard for the Installation of Lightning Protection Systems
2020

NFPA 855
Standard for the Installation of Stationary Energy Storage Systems
2020

NFPA 1
Fire Code
2021
RELATED INDUSTRY EFFORTS - EXAMPLES

- GR-1089 – EMC ………………GR-63/GR-3108/GR-3171/GR-3178 – Inside Equipment
- UL Listing of Telecommunications Equipment and Devices
- GR-513 – Powering
- 0600013 - Electromagnetic Compatibility (EMC) and Electrical Protection
- 0600315 - Voltage Levels for DC-Powered Equipment Used in the Telecom Environment
- 0600318 - Electrical Protection Applied to Telecom Network Plant at Customer Entrances
- 0600337 - Maximum Voltage, Current, and Power Levels Used in Communications Circuits
- 0600338 - Electrical Coordination of Primary and Secondary Surge Protection