



National Electrical Code NEC (NFPA 70)

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National Electrical Code (NEC)



- Adopted in all 50 states, NFPA 70, the **National Electrical Code (NEC)** is the benchmark for safe electrical design, installation, and inspection to protect people and property from electrical hazards.
- The **National Electrical Code (NEC)** is enforced by **local and state authorities** responsible for electrical safety regulations. These authorities include building inspectors, fire marshals, and electrical inspectors. They ensure that electrical installations comply with the NEC standards to prevent hazards and protect public safety.
- The **National Electrical Code (NEC)** is updated on a **three-year cycle**. The **National Fire Protection Association (NFPA)**, which publishes the NEC, reviews and revises it periodically to address emerging technologies, safety concerns, and industry advancements. The latest NEC is the **2026 edition** that includes reorg for medium voltages and **major changes for communications**.
- Currently the 2026 NEC is open for revision comments (Public Inputs) – **Deadline April 9th 2026**

What is Driving These Changes in the Codes?

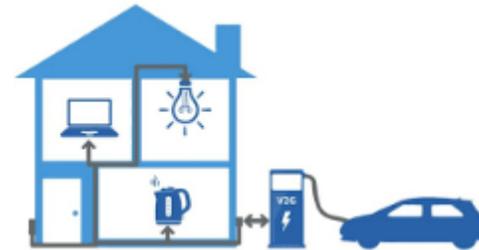
Power Sources are evolving quickly.

Traditional Power Generation Facilities are being augmented by more “alternative” sources, many not owned by the utility, and many more bi-directional sources/loads.

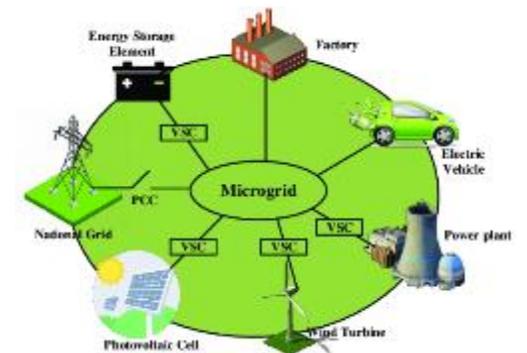


Floating Photovoltaics

EV Vehicle to Grid



Microgrids



What are NFPA/NEC objectives?

Desire to remain relevant with quickly evolving electrical industry

Respond to needs of the inspection community

Improve usability by eliminating redundancy

Place content where it makes sense in a logical/parallel structure

Improve Limited Energy Content in 2026

Improve Medium Voltage Content in 2023/2026

Eliminate “Special Equipment” – *Equipment is Equipment*

Leverage the past to make the future even better

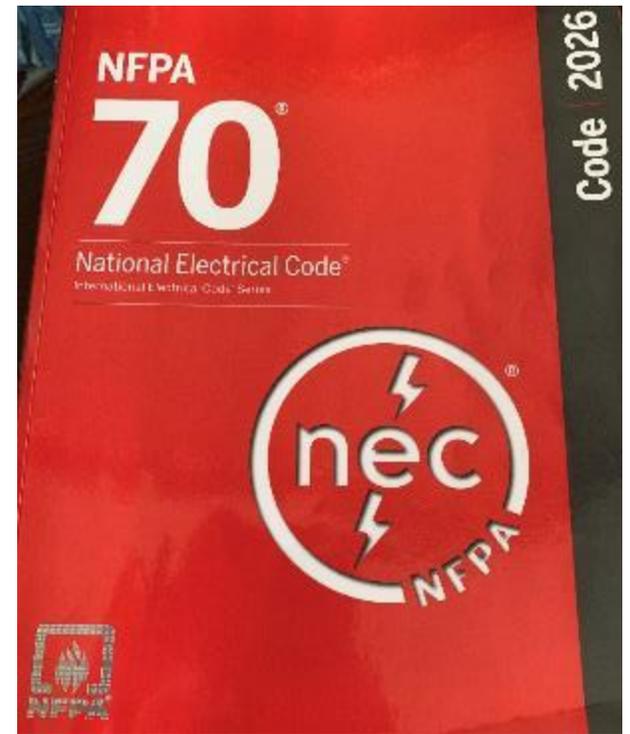
For communications arena – catch up the NEC content and structure with the rapidly evolving communications networks and technologies

Look to the future = Modernize the code



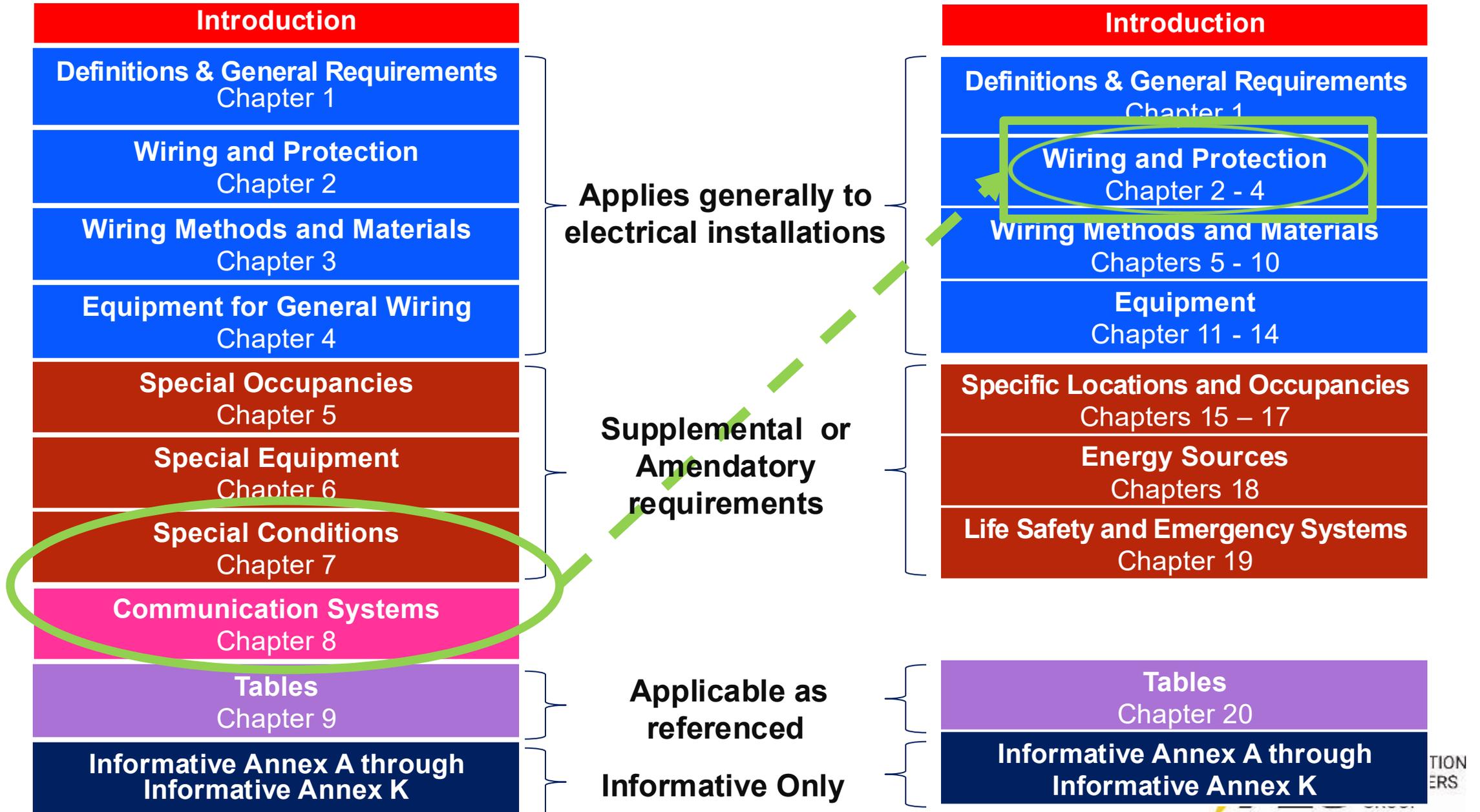
National Electrical Code (NEC)

- **2026 code completed and published**
- **CC's long-term reorganization plan incorporated as Informational Annex L in 2026 code** (open for comment)
- **90.2 and 90.3** - preliminary changes to facilitate the implementation of the future (2029) proposed structure.
- **2026 NEC** – Has small article and chapter changes compared to the major reorganization to complete the NEC long-term vision for 2029 code.

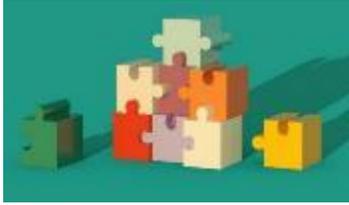


90.3 (2023 NEC)

Proposed 90.3 (2029 NEC)



2023



9 Chapters with common features and special articles

2026



2026 – re-arranged medium voltage and communications articles

2029



30 chapters in reorg code

2026 Status – The NEC code train is at the station ready to follow the rail to 30 chapters



Users need to take this opportunity through Public Inputs (PIs) to guide the progress and align the code with the best communications industry practices

Limited Energy Definitions

Limited-Energy System -- *The equipment and cables of an end-to-end system that are either power-restricted, or capable of limiting or shutting down the power source to prevent deviations above normal operating limits to mitigate hazards related to electric shock and fire.*

Cable, Limited-Energy (Limited-Energy Cable) -- *A factory assembly of one or more conductors or optical fibers used for any of the following:*

- (1) *Class 2 circuits*
- (2) *Class 3 circuits*
- (3) *Class 4 circuits*
- (4) *Optical fiber systems*
- (5) *Communications circuits*
- (6) *Community antenna television circuits (CATV)*
- (7) *Network-powered broadband low-power communications circuits*
- (8) *Premises communications circuits*
- (9) *Power-limited fire alarm circuits*

Importance of Article 100

Definitions - 1

Communications Service Provider. An organization, business, or individual that offers communications service to others. (CMP-16)

Communications System. The communications equipment, communication circuits, and manual and machine operations necessary for the transmission, movement, and reception of information (e.g., voice, audio, data). (CMP-16)

Communications Utility. An organization designated or recognized by an entity such as a public service commission or public utility commission, or recognized as such under federal, state, or local law. (CMP-16)

Class 1 Circuit. The portion of the wiring system between the load side of the Class 1 power source and the connected equipment. (CMP-3)

Class 2 Circuit. The portion of the wiring system between the load side of a Class 2 power source and the connected equipment. (CMP-3)

Informational Note: The design of a Class 2 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock due to its power limitations.

Class 3 Circuit. The portion of the wiring system between the load side of a Class 3 power source and the connected equipment. (CMP-3)

Informational Note: The design of a Class 3 circuit considers safety from a fire initiation standpoint. Since higher levels of voltage and current than a Class 2 circuit are permitted, additional safeguards are specified to provide acceptable protection from electric shock.

Class 4 Circuit. The portion of the wiring system between the load side of a Class 4 transmitter and the Class 4 receiver or Class 4 utilization equipment, as appropriate. (CMP-3)

Informational Note No. 1: A Class 4 circuit is also commonly referred to as a fault-managed power circuit.

Informational Note No. 2: Due to the active monitoring and control of the voltage and current provided, a Class 4 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock.

Importance of Article 100

Definitions - 2

N Communications, Data. (Data Communications) The transfer and reception of information in the form of a digital bitstream or a digitized analog signal transmitted over a point-to-point or point-to-multipoint arrangement. (CMP-16)

Communications Circuit. A metallic, fiber, or wireless circuit that provides voice/data (and associated power) for communications-related services between communications equipment. (CMP-16)

Informational Note: Because communications can be carried over conductors with power, meeting both this definition and the definition for another circuit defined by this code is possible. For example, a power line communications device can be used on a branch circuit. The addition of data to an existing circuit type defined by this code does not by itself change the requirements for the existing circuit type in this code.

Δ Communications Circuit, Premises. (Premises Communications Circuit) The circuit that extends voice, audio, video, data, interactive services, telegraph (except radio), and outside wiring for fire alarm and burglar alarm from the service provider's network terminal to the customer's communications equipment. (CMP-16)

Communications Equipment. The electronic equipment that performs the telecommunications operations for the transmission of audio, video, and data, and includes power equipment (e.g., dc converters, inverters, and batteries), technical support equipment (e.g., computers), and conductors dedicated solely to the operation of the equipment. (CMP-16)

Informational Note: As the telecommunications network transitions to a more data-centric network, computers, routers, servers, and their powering equipment, are becoming essential to the transmission of audio, video, and data and are finding increasing application in communications equipment installations.



New Limited Energy Articles

- New category of “Limited Energy” circuits and systems was defined to include
 - Class 2, 3 and 4 systems - Includes new FMPS (Class 4) powering systems
 - All the communications circuits that were located in Chapter 8
 - Traditional twisted pair, CATV, antenna systems, premises power and network powered broadband systems
 - Four articles/sections were left orphaned in Chapter 8 – current proposal is to bring them in as new article to other LE articles
- The over-riding direction and intent was to move requirements into a more logical arrangement BUT NOT TO MAKE TECHNICAL CHANGES.



Limited Energy (LE) Articles

720	General Requirements for Limited-Energy System Wiring Methods and Materials
Part I.	General
Part II.	Installation
721	Power Sources for Limited-Energy Systems
722	Limited-Energy Cables for Power-Limited Circuits, Fault-Managed-Power Circuits, Optical Fiber Circuits, and Communications Circuits
Part I.	General
Part II.	Marking Requirements
Part III.	Limited-Energy Cables and Wiring Methods
Part IV.	Communication Cables and Wiring Methods
Part V.	Class 2 or Class 3 Cables and Wiring Methods
Part VI.	Class 4 Cables and Wiring Methods
Part VII.	Optical Fiber Cables and Wiring Methods
Part VIII.	Power-Limited Fire Alarm (PLFA) Cables and Wiring Methods
Part IX.	Circuit Integrity Cables (Type CI), Fire-Resistive Cable Systems, and Electrical Circuit Protective Systems
723	Raceways, Cable Routing Assemblies, and Cable Trays for Limited-Energy Systems

Part I.	General
Part II.	Application and Installation of Raceways for Limited-Energy Systems
Part III.	Application and Installation of Cable Routing Assemblies for Limited-Energy Systems
Part IV.	Cable Trays for Limited-Energy Systems
724	Class 1 Power-Limited Circuits and Class 1 Power-Limited Remote-Control and Signaling Circuits
725	Class 2 and Class 3 Power-Limited Circuits
Part I.	General
Part II.	Installation Requirements
Part I.	Class 4 Fault-Managed Power Systems
Part I.	General
Part II.	Class 4 Circuits
742	Oversvoltage Protection of Limited-Energy Systems
Part I.	General
Part II.	Primary and Secondary Protection
750	Grounding and Bonding of Limited-Energy Systems
Part I.	General
Part II.	Conductors and Equipment Outside and Entering Buildings
Part III.	Grounding and Bonding Methods
Part IV.	Primary and Secondary Protection

Orphan
Articles
from
Chapter 8

Chapter 8 Communications Systems — Outside and Entering Buildings

800 General Requirements for Communications Systems Outside and Entering Buildings

Part I. General

Part II. Wires and Cables Outside and Entering Buildings

810 Antenna Systems

Part I. General

Part II. Receiving Equipment — Antenna Systems

Part III. Amateur and Citizen Band Transmitting and Receiving Stations — Antenna Systems

Part IV. Interior Installation — Transmitting Stations

820 Community Antenna Television and Radio Distribution Systems

Part I. General

Part II. Protection

Part III. Grounding Methods

830 Network-Powered Broadband Communications Systems

Part I. General

Part II. Cables Outside and Entering Buildings

Part III. Installation Methods Within Buildings

Chapter 9 Tables

1 Percent of Cross Section of Conduit and Tubing for Conductors and Cables

2 Radius of Conduit and Tubing Bends

4 Dimensions and Percent Area of Conduit and Tubing (Areas of Conduit or Tubing for the Combinations of Wires Permitted in Table 1, Chapter 9)

5 Dimensions of Insulated Conductors and Fixture Wires

5A Compact Copper and Aluminum Building Wire Nominal Dimensions** and Areas

8 Conductor Properties

9 Alternating-Current (ac) Resistance and Reactance for 600-Volt Cables, 3-Phase, 60 Hz, 75°C (167°F) — Three Single Conductors in Conduit

10 Conductor Stranding

11(A) Class 2 and Class 3 ac Power Source Limitations

12(A) PLFA ac Power Source Limitations

13 Equipment Suitable for Hazardous (Classified) Locations



**From
Informative Annex L
2026 edition –**

***Proposed Organization
of the 2029 NEC***

	2023	2026	2029
Chapter 4 Wiring and Protection for Limited Energy Systems			
General Requirements for Limited-Energy System Wiring Methods and Materials	300	720	400
Limited-Energy Cables	722	722	405
Raceways, Cable Routing Assemblies, and Cable Trays of Limited-Energy Systems	800, 805, 810, 820, 830, 840	723	406
Class 2 and Class 3 Limited-Energy Systems	725	725	410
Class 4 Fault-Managed Power Systems	726	726	411
Communication Systems — Outside Entering Buildings	800, 805, 810, 820, 830, 840	800, 810, 820, 830	430
Part I — Communication Systems			
Part II — Antenna Systems			
Part III — CATV			
Part IV — Networked-Powered Broadband Communication Systems			
Part V — Premises-Powered Broadband Communication Systems			
Power Sources of Limited-Energy Systems	725, 726, 820, 830, 840	721	440
Overvoltage Protection of Limited-Energy Systems		742	442
Grounding and Bonding of Limited-Energy Systems	805, 810, 820, 830, 840	750	450

Positives in 2026 NEC



- The creation of these “**Limited Energy**” articles should eliminate perceived confusion about the appropriate treatment in the NEC for data cables, machine-to-machine communications circuits, broadband systems and the other types of communication cables that are used in various applications.
- The affirmation and inclusion of Class 4 – **Fault Managed Power Systems** – used for providing power to communications facilities into the NEC.
 - Revisions were initially made in the 2023 edition were confirmed in 2026 edition and of the NESC (National Electrical Safety Code) that covers the safe use of Fault-Managed Power Systems in the outside plant facilities of communications. Further guidance on use of these FMPS systems has also found in ATIS, UL and the Construction Blue Book (SR-1421).
- 2026 - Improved clarity in grounding and bonding guidance in Section 800.48 on the appropriate interface between outside plant cables and the inside cables of the premises cables → should be incorporated into LE articles for 2029

Open Issues for 2026 NEC



- Fate of orphaned Chapter 8 articles uncertain
 - 800, 805, 810, 820 & 830 → current proposal is to bring into new LE article
- Reorganization process and path forward - 720-through-750 → Chapter 4 in 2029
- Concerns -
 - Are all necessary exemptions added to the limited energy (LE) articles given the loss of independence of Chapter 8? – seems so but needs due diligence
 - Despite due care and attention, omissions may have slipped through
 - Needs further real world user review and practical feedback



Candidate Sections in 2026 edition for more review

- Listing & Marking guidance – 722.2 and 722.100, 722.131,
- Cable substitution Tables – 722.122, 722.132,
- Installation – 720.22, 722.15, 722.120, 722.131 and Article 723 – for most current guidance about what cables with limited energy circuits when installed can be mixed together or need to be separated in ducts, cable trays, and routing assemblies.
- FMPS Class 4 guidance – 721.50, 722.150, and Article 726
- Raceways, Cable trays, and Listed Cable Routing Assemblies – 722.130 & 723
- Class 2 and 3 specific rules – Article 725
- Protection requirements for communications circuits – Article 742
- Section 800.48 along with 750.48 and 250.94 to better understand the grounding and bonding requirements where network outside plant cables meet premises wiring.



Recommendations for Communications Users

Need to be practical, look to future likely actions, and keep their options open

- 1) Users should **not** revise their training manuals to reference the new 2026 code. The interim article and rule numbers are expected to change again in the next cycle.
- 2) If users build their installations to **meet the 2023 edition**, then they should also meet the intent of the 2026 and 2029 code editions.
- 3) Selected sections in the 2026 edition would benefit by user review and included in any training materials because (1) of the improvements in clarity from revisions and (2) for finding mistakes or code inconsistencies in new LE articles compared to 2023 communications articles.

Immediate Next Steps for 70 (NEC)

- 2026 - Prepare Public Inputs for next code cycle (2029)
 - Deadline 9th April 2026
 - First revision meetings – 3rd Quarter 2026
- Correlating Committee Task Groups
 - Active now

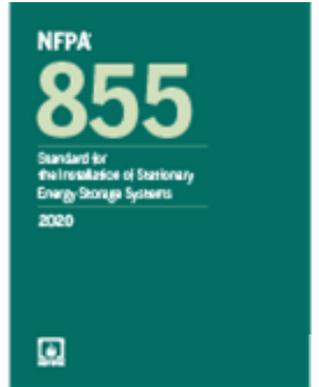


More than NEC – NFPA Standards and Related Codes –

as ATIS reps we are directly involved with, review as part of Correlating Committee, or monitor activity of the following

- NFPA 1, Fire Code -- International Fire Code (IFC)
- NFPA 58 - Liquefied Petroleum Gas (LP-Gas) Code
- NFPA 70, National Electrical Code (NEC) Handbook (2026)
- NFPA 70B, Electrical Equipment Maintenance (2026)
- NFPA 70E, Electrical Safety in the Workplace (2024)
- NFPA 72, National Fire Alarm and Signaling Code (2025)
- NFPA 73, Electrical Inspections for Existing Dwellings (2026)
- NFPA 75, Fire Protection of Information Technology Equipment (2024)
- NFPA 76, Fire Protection of Telecommunications Facilities (2024)
- NFPA 79, Electrical Standard for Industrial Machinery (2024)
- NFPA 110, Emergency and Standby Power Systems (2025)
- NFPA 111, Stored Electrical Energy Emergency and Standby Power Systems (2025)
- NFPA 790, Competency of Third-Party Field Evaluation Bodies (2024)
- NFPA 791, Recommended Practice & Procedures for Unlabeled Electrical Equipment Evaluation (2024)
- NFPA 800, Battery Safety Code (PS) – Provisional Standard
- NFPA 855, Installation of Stationary Energy Storage Systems (2026)

NFPA 855 – Standard for the Installation of Stationary Energy Storage Systems (ESS)



Why and How? --

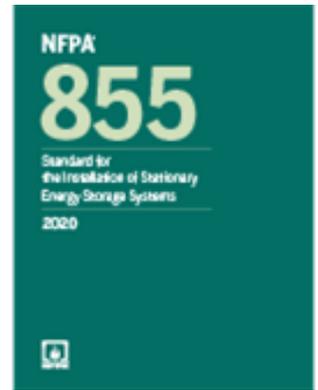
855 was developed owing to the fire and explosion risk of commercial and grid connected ESS that use flammable battery chemistries.

In first two editions, progress was made to recognize limited exclusions for stationary standby and UPS applications using the traditional safe lead-acid and nickel-cadmium batteries systems.

855 is part of NFPA 1, Fire Code and ICC, International Fire Code (IFC).

New 855 replaces the older and simpler guidance on safe battery usage that was in place for decades, and sufficient before, lithium-ion proliferation in large ESSs.

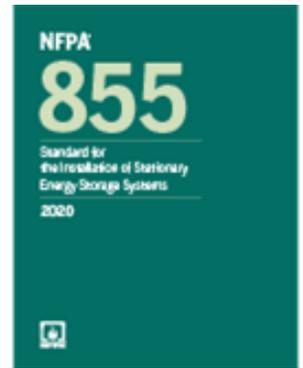
2026 Edition of 855 – includes Broadened Exemptions for Lead Acid and Telecom Applications



Utility Based Exemptions

- Section 4.7.5.3 – NEC Compliance and Disconnect Placard
- Section 6.1 – Commissioning Plan
- Section 8.1 – Decommissioning Plan
- Section 7.1 – Maintenance per Manufacturer Documentation Chemistry Based Exemptions
- Section 4.10 – Emergency Power for Critical Safety Systems
- Section 9.3 – Listing to UL 9540
- Section 9.2.1.1 – Large-scale Fire Testing
- Section 9.3.2.3– Hazard Mitigation Analysis
- Section 9.3.3 – Need for an Energy Management System
- Section 9.5.1 – Size and Separation Rules
- Section 9.7.1 – Fire Detection at Small Remote Sites
- Section 9.7.2 – Automatic Fire Suppression
- Section 9.7.3 – Water Supply
- Section 9.7.5 – 2-Hour Fire Rated Partition Lowered to 1-Hour
- Section 9.7.6.7 – Explosion Control & Prevention.

Recommendations & Plans for Next 855 Code Cycle



1) Recommendations – Advocate for more exemptions based on safety history of telecom utilities:

- Consider a higher threshold for lead-acid to fall under the standard:
- Current threshold is 70 kWh based on 50 gallons of electrolyte
- Consider a higher limit for VRLA which have only about 1/3 of the electrolyte and are less of a hazard.

2) EPA standards differentiate between emergency and standby from “for profit” use. Maybe this concept can be evolved into more practical treatment in NFPA 855 and other NFPA standards.



NFPA 800 – Battery Safety Code

NFPA 800 Battery Safety Code is a Provisional Standard with an objective of becoming New NFPA Standard

- Richard Kluge and Ernie Gallo are on the Technical Committee members representing ATIS.
- Standard is to address known hazards associated with batteries.
- Emphasis on considering the full life cycle components –
 - Manufacture – Storage – Shipping – Use – Recycling.
- Most of urgent content is related to lithium, but as with NFPA 855, lead-acid and all other chemistries are expected to tend to pulled in.



NFPA 800 Content

Chapter 1, Administration (Contains the scope among other things.)

Chapter 3, Definitions

Chapter 4, General Requirements

Chapter 5, Manufacturing; Assembly; and Laboratory Research; Development and Testing

Chapter 6, Storage of Batteries and Battery Products

Chapter 7, Transportation and Shipping of Batteries

Chapter 8, Battery Powered Equipment (BPE) Infrastructure, Installation and Operational Safety

Chapter 9, Battery Recycling, Disposal and Decommissioning



NFPA 800 Concerns

- Large focus on battery manufacturing, storage, and charging and use of powered devices such as E-bikes, scooters, cars, robots.
- Scope and Chapter 8 are biggest concerns.
- Each chapter has a separately developed scope.
- Lead-acid could become over-regulated.
- Needs to mesh with NFPA 855 for stationary ESS.
- Will be rushed into publication as a provisional standard this year. Will then enter a normal 3-year development cycle.

The background of the slide is a dense, overlapping collage of small, rectangular sticky notes in various colors including red, blue, green, yellow, pink, and light blue. Each sticky note features a large, black question mark in the center. The notes are scattered across the entire frame, creating a textured and busy visual effect.

Thank You & Questions