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National Electrical Code® Correlating Committee White Paper

Keeping the NEC® Relevant - Is Now the Time to Modernize?

The National Electrical Code® (NEC®) is the foundation of the electrical installation regulatory infrastructure for the United States, Mexico, and numerous other jurisdictions around the world. Growing demand for safe, reliable, resilient, and efficient use of electrical power to support society and the economy is aligning with technological advancement of power generation sources, electrical distribution, and new electrical power loads. It is critical the NEC be revised and implemented by the electrical community every three years to support the accelerating pace of change and technological advancement.

The structure of the NEC plays a critical role for personnel in learning, understanding, applying, and enforcing the requirements established within this regulatory code. While the current structure, first introduced in 1937, has provided tremendous success and stability and continues to be used by engineers, contractors, electricians and training programs, the ability to efficiently learn and quickly apply and inspect advancing technologies and uniquely configured electrical systems is a challenge for all electrical professionals. The existing NEC structure needs modernization to continue to support the advancing electrical infrastructure configurations and technological advancements. Therefore, it is imperative that the electrical industry actively pursue a revised NEC organizational structure to support ease of learning, understanding, and applying the NEC safety provisions in a rapidly advancing new energy landscape.

Industry Trends

Historically, the NEC was written based on a serving utility providing electricity to a premises with conductors, overcurrent devices, and loads. While this theme has held true for a majority of the NEC's lifespan, technology changes over the past two decades have challenged this theme. New and evolving technologies along with novel concepts have been "force fit" into the existing structure due to the structural constraints that impact overall usability. Many other industry trends are also challenging the existing structural model:

- Communication systems in Chapter 8 are no longer installed or maintained by communication utilities.
- Electrical Systems over 1000V AC / 1500V DC (Medium Voltage) has expanded well beyond utility ownership.
- Limited energy systems in Chapter 7 and 8 are commonplace (no longer "special") and are morphing into systems that mimic Chapter 3 wiring methods.
- Distributed Energy Resource technologies are challenging the status of single-direction power flow and connection to a premises or to the utility.



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- DC circuits and advanced electrical storage technologies are increasing in use.
- Energy monitoring, control and automation are accelerating energy resilience, such as microgrids, energy efficiency, and alternate power sources.
- Enforcement of the NEC is conducted by many disciplines that can include electrical inspectors, consulting engineers, building officials and fire officials.

These trends and others require that we look to challenge the status quo and look to a more robust layout that will enhance the stability and usability for the next several decades and beyond. The modernization effort already underway is evidenced by substantive changes in the following areas:

Medium Voltage

The application of the NEC to support the safe installation of systems operating above 1000V AC/1500V DC is critical as these systems are becoming more common under the regulatory enforcement jurisdiction of the NEC. Organizational revisions are the first step to not only clarify but set the foundation to expand and enhance the installation requirements for these systems. Expanding and focusing expertise to support further development of medium-voltage systems in the NEC is important to the relevance of the NEC.

Limited Energy

The installation of communications systems is no longer limited to traditional telephone and cable utilities. Telecom utilities have been replaced with the term service provider and the installing contractor can be anyone. What was once separate and distinct data systems in Chapter 7 and communication systems in Chapter 8 are being morphed into one overall electrical system complete with communication, signaling, and power, all wrapped into one cable. NEC users can be confused when trying to determine the applicability of requirements. It is important that NEC users be able to easily understand and apply the provisions for limited energy circuits.

The usability of the NEC will be enhanced by moving limited energy and communication code requirements in order to recognize these systems as general installations instead of unique or special systems.

Multidirectional Power Flow

The industry is shifting from a single primary source, where the system characteristics such as the available fault current are well understood, to systems with variable and parallel sources. This arrangement results in multidirectional power flow in the electrical system to supply the connected loads. The structure of the NEC needs to support the installation and protection of these systems.



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Digital Delivery of Content

How individuals get their information is changing. As print materials evolve to a more electronic medium, arrangement of NEC content is critical to support usability in both print and digital formats. Rapid technology changes and complex terminology will demand a higher level of usability from NEC users.

Future Vision

In March of 2022, the NEC Correlating Committee formed a “Structure” Task Group to review the current NEC structure to see if changes are warranted. While initial discussions were favorable that changes are necessary, the Correlating Committee is soliciting feedback from stakeholders to make sure that a common vision is shared in order to provide the best possible document as we move toward the future. The scope of this activity is focused on structure and organization of the NEC to provide the necessary framework for Technical Committees to make technical changes. As such any change will only involve structure and not affect technical content.

Path Forward

Modernizing the NEC to enhance usability will assist the user when applying the requirements and the technical committees in developing those same requirements. A significant structural revision requires a commitment from the organizations represented on all of the technical committees. Organizations may need to review their representation for the appropriate expertise when structural change also results in a shift in the responsibility of a technical committee.

The Correlating Committee will need to continue to review technical committee scopes and monitor for conflicting language and any correlation issues. A significant opportunity to enhance the relevance of the NEC exists through the revitalization of the NEC structure to support the future electrical infrastructure.

The changing landscape of how electrical power is generated, delivered, used, and controlled is exciting and challenging for all involved. This includes those responsible for codes and standard development. The NEC has served the electrical industry well for over a century and has evolved with the industry that uses it.

Ensuring the NEC is reflective of the industry that uses it daily should be of interest to all who use the document. To that point we would like your feedback on the draft modernization outline. Please provide your feedback to the NEC staff liaison, Jeff Sargent @ jsargent@nfpa.org.

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Scope Consideration: **Limited Energy Circuits or Systems:** Data, communication, antenna, class 2, class 3 or class 4 circuits or systems for, but not limited to, lighting systems, remote control, signaling, control, alarm, and audio signal, including associated components as covered by this code.

The circuitry and equipment for indoor lighting and outdoor lighting systems that are supplied by the secondary circuit of an isolating power supply operating at 30 volts or less as covered by Article 411.

DRAFT