

TOP SEVEN 2017 NEC CHANGES YOU NEED TO KNOW

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The 2017 edition of the National Electrical Code (NEC) includes many changes covering traditional and alternative sources of electrical power.



NFPA 70: National Electrical Code (NEC)

is the benchmark for safe electrical design, installation, and inspection to protect people and

property from electrical hazards in residential, commercial, industrial, and other markets. Below are the top things you need to know:

1. INCREASED SHOCK PROTECTION

The 2017 NEC expands requirements for protection from shock hazards through application of panelboard barriers, tamper-resistant receptacles, and ground-fault circuit-interrupters (GFCIs). Updates include:

- **210.8(B)** – GFCI protection of single-phase receptacles rated 150 volts (V) to ground or less expanded to include all 50 amperes (A) or less, instead of 20 A or less. Also, 3-phase receptacles 150 V to ground or less and 100 A or

less.

- **210.8(B)(9) & (10)** – GFCI protection of receptacles expanded from dwelling unit crawl spaces and unfinished basements to now include those same locations in non-dwelling units.
- **210.8(E)** – GFCI is now required for lighting outlets in crawl spaces.
- **406.12** – Tamper-resistant receptacles have been expanded to 250 V non-locking-type receptacles to a list of new areas that include mobile homes, preschools and elementary education facilities, and other areas where children are likely to be present.
- **408.3(A)(2)** – Barrier requirements are expanded to all service panelboards. No uninsulated, ungrounded service busbars or service terminals can be exposed to inadvertent contact by persons or maintenance equipment.
- **422.5** – The five appliances that are/have been required to have GFCI protection are now all grouped in this section with a total of five methods permitted to achieve this requirement.
- **555.3** – Overcurrent protective devices that supply marinas, boatyards, and commercial and non-commercial docking facilities that have ground fault protection not exceeding 30 mA.
- **682.15** – All outdoor receptacles, in or on floating buildings or structures within the electrical datum plane area, must now have GFCI protection.
- **690.12** – This section was modified to emphasize rapid shutdown requirements for reducing the shock hazard to emergency responders. Clarity was added to this section by dividing it into four separate subsections as well as other functionality details.

2. PRODUCT LISTING AND SUITABILITY

Products are tested to standards compatible with the NEC, raising awareness on the importance of UL and similar agency standards. (Installs are not treated as separate structures, and solutions like electric vehicle chargers and

marina pedestals are considered equipment and not structures.) Updates include:

- **100 – Structure** – The words, "other than equipment," were added to the definition of a structure to help recognize that such products as electric vehicle chargers and marina pedestals are not structures and should be treated as equipment.
- **110.3** – New language provides clarity that products are to be listed to standards recognized as achieving equivalent and effective safety for equipment installed to comply with the NEC.

3. ARC FLASH AWARENESS

To continue raising awareness of incident energy hazards, service entrance equipment rated 1200 A or more must now be clearly labeled for fuse and circuit breaker selections. Reduction requirements continue to reduce incident energy at service entrance panels. Updates include:

- **110.16(B)** – Service entrance equipment rated 1200 A and higher must now include a label that shows the nominal system voltage, available short-circuit current, clearing time of the service overcurrent protective device based on that available short-circuit current, and the date the label was applied. The exception permits a 70E-type label to take the place of this information.
- **240.67** – For fuses rated 1200 A and above, this new requirement which doesn't go into effect until January 1, 2020, and mirrors the requirements of 240.67 mandating arc energy reduction methods to be employed when the arcing current clearing time is greater than 0.07 seconds.
- **240.87** – Use of a device's instantaneous trip unit was added as one of the methods to reduce arc energy when the arcing current is in the instantaneous region of the circuit breaker by design. This does not mean we can field modify the settings of the breaker to meet this language.

4. SHORT CIRCUIT CURRENT RATINGS (SCCR)

The NEC 2017 edition increases awareness of the proper application of electrical distribution equipment with regard to SCCR and expands the types of equipment that require SCCR marking.

Mandatory equipment SCCR marking:

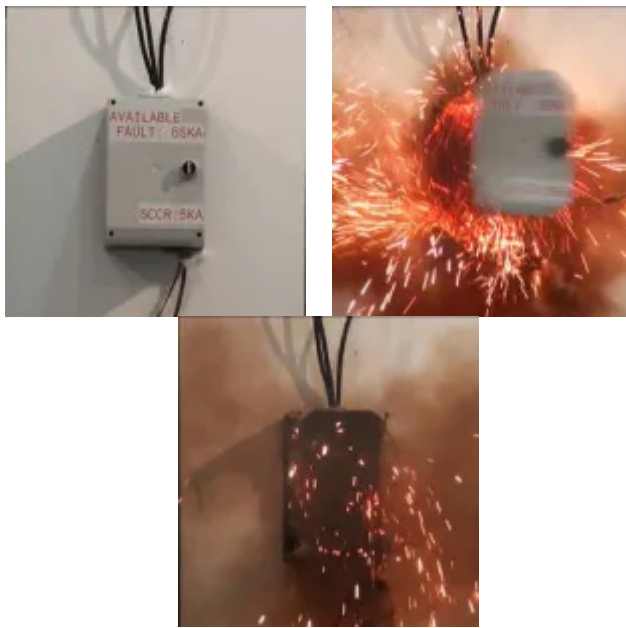
- 409.110(4) Industrial Control Panels
- 430.8 Motor Controllers
- 430.98 Motor Control Centers
- 440.4(B) Air Conditioning & Refrigeration Equipment
- 620.16(A) Elevator Control Panel
- 670.3(A)(4) Industrial Machinery
- 700.5(E) Transfer Equipment for Emergency Systems
- 701.5(D) Transfer Equipment for Legally Required and Standby Systems
- 702.5 Transfer Equipment for Optional Standby Systems
- 708.24(E) Transfer Equipment for Critical Operations Power Systems.

Requirements for equipment SCCR to be greater than the available short circuit current:

- 110.10 Circuit Impedance, Short-Circuit Current Rating, and other Characteristics
- 409.22(A) Industrial Control Panels
- 440.10(A) Air Conditioning & Refrigeration Equipment
- 620.16(B) Elevator Control Panels
- 670.5(1) Industrial Machinery.

5. AVAILABLE SHORT-CIRCUIT CURRENT

The proper application of electrical equipment includes rating the equipment to handle available short-circuit current levels and marking that level on the equipment after installation.



Requirements for either marking available short-circuit current or documenting that value at equipment:

- 110.24 Service Entrance Equipment
- 409.22(B) Industrial Control Panels
- 440.10(B) Air Conditioning & Refrigeration Equipment
- 620.51(D)(2) Elevator Control Panels
- 670.5(2) Industrial Machinery.

6. SURGE PROTECTION

For increased protection and reliability, the NEC 2017 expands requirements for safety-related circuits. Surge protection is required for fire pump controllers, critical operations data systems, industrial control panels, including machinery with safety interlock circuits, and disconnects that supply emergency system loads. Updates include:

- 620.51(E) – Surge protection is now required where any of the disconnecting means for elevators, dumbwaiters, escalators, moving walks, lifts and chairlifts have been designated as supplying an emergency system load.
- 645.18 – New requirement for surge protection in critical operations data systems.
- 670.6 – Surge protection is now required for industrial machinery with safety interlock circuits.
- 695.15 – A listed surge protective device must now be

installed in or on fire pump controllers.

7. MAINTENANCE

Maintenance requirements are expanding for emergency systems to ensure the entire system is maintained in accordance with manufacturer's instructions and industry standards. Provisions ensure backup power is available during maintenance or repairs when the emergency system relies on a single alternate power source. Updates include:

- **700.3(C)** – New requirement that emergency system equipment must be maintained in accordance with manufacturer's instructions and industry standards.
- **700.3(F)** – These new provisions provide us with performance-based requirements to ensure backup power is available when maintenance or repairs are being made to those installations where the emergency system relies on a single alternate source of power.