



## DEPARTMENT OF ADMINISTRATIVE SERVICES

### PROPOSED CHANGE OF THE CONNECTICUT STATE BUILDING CODE AND FIRE SAFETY CODE

DATE SUBMITTED: \_\_\_\_\_

#### CODE INFORMATION

Proposed change to:  Building Code  Fire Safety Code

Code section(s):  
\_\_\_\_\_  
\_\_\_\_\_

#### PROPOSER INFORMATION

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#### PROPOSAL INFORMATION

Description of change and reason for change (attach additional information as needed):  
\_\_\_\_\_

Proposed text change, addition or deletion (attach additional information as needed):  
\_\_\_\_\_

Supporting data and documents (attach additional information as needed):  
\_\_\_\_\_

- This Proposal is original material.** (Note: Original material is considered to be the submitter's own idea based on or as a result of his/her own experience, thought or research and, to the best of his/her knowledge, is not copied from another source.)
- This Comment is not original material, its source (if known) is as follows:** (such as material / code development proposal from a prior development cycle or proposal submitted to model code committee etc.)  
\_\_\_\_\_
- I would like to make an in-person presentation of my proposal.**  
\_\_\_\_\_

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Proponent's Signature

\_\_\_\_\_  
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12/29/16

## **PROPOSAL INFORMATION**

### **Description of change and reason for change (attached additional information as needed):**

This proposal adds an equivalent and practical alternative method of providing AFCI protection that is intended to reduce the number of trips up-and-down stairs to the electrical panel for the testing, operation, and troubleshooting of AFCIs, and in the process reduce death and injury exposure to Connecticut families, especially the 65-and-over adults.

AFCIs and GFCIs, as part of recommended routine safety checks and maintenance, must be tested monthly, which requires going back-and-forth between the electrical panel and the areas being protected in order to verify the electronics and switching contacts are functioning properly to turn off power when called upon. Additional trips are expected due to nuisance trips with loads such as treadmills, game consoles, kitchen appliances, mostly plug-in loads on receptacle branch circuits, as the industry continues to receive reports of nuisance trips.

Nationally, from 2017 to 2021, there was an over 25% increase in death and injuries from falls in homes, with stairs being the most dangerous location and responsible for 23% of the fatalities, according to the National Safety Council. For 2021 alone, there were 29,100 death and 3 million injuries treated in hospital emergency facilities that were attributed to falls in the homes.

Locally, as reported by Connecticut Department of Public Health, the CDC estimated that “injury-related medical, work loss, and quality of life costs in Connecticut exceeded one trillion dollars in 2020; \$2 billion from deaths, \$374 billion from hospital admissions, and \$648 billion from emergency department treatment and release.” In addition, it was noted that “In 2021, approximately 85% of fall-related deaths and 70% of fall-related hospital admissions occurred among Connecticut residents 65 years of age and older.” Connecticut’s 65-and-older population accounts for 18.3% of the overall population.

The Electrical Safety Foundation International (ESFI) recently published a survey[3] of 100 Massachusetts electrical contractors that showed over 38,000 calls associated with AFCI and GFCI breakers in 2021. According to the 2023 follow-up to the 2020 survey of contractors that responded to the East Carolina University survey, electrical contractors are still dealing with at least one nuisance tripping issue in 33% of the jobs involving AFCIs, with 18% being two or more issues requiring two or more call backs. Considering the fact that the majority of dwelling units are 2 levels or more, with the electrical panel typically installed in the basement or garage, it is not hard to conclude that more trips between the electrical panel and the areas being protected means increased likelihood of trips and falls on the stairs, often times fatal events for the senior population. In fact, of the 29,100 deaths, noted earlier, due to falls in the homes that occurred in 2021 nationally, over 25,000 were adults aged 65 and older. Overall, falls among adults aged 65 and older cost over \$50 billion annually. For Connecticut in 2020, the figures were “over 400 older adults in Connecticut died from a fall and over 37,000 were sent to the hospital for care”.

For new constructions in Connecticut, there had been and will continue to be one realistic option out of the six permitted by the current Article 210.12(A) which is 210.12(A) (1), that forces consumers to traverse stairs to their electrical panel when dealing with AFCIs. The remaining, so called, “options” are either not commercially available (such as (2), (3) and (4)) or not practical (such as (5) and (6)).

With most nuisance trips occurring with plug-in loads on receptacle branch circuit, this proposal will provide homeowners relief by first giving homeowners the flexibility to choose between multiple offerings of Outlet Branch-Circuit (OBC) AFCIs, providing local test/reset, rather than stuck with limited offering from the same electrical panel manufacturer, and second, reduce the number of times they must traverse the stairs to operate the AFCIs , and in the process decreasing the likelihood of injury and fatality from AFCI involved activities in the homes. After all, human-life saving devices shall never be the cause of human deaths and injuries.

**Proposed text change, addition or deletion (attach additional information as needed):**

## **210.12**

### **(A) Means of Protection.**

AFCI protection shall be provided by any of the following means:

- (1) A listed combination-type AFCI installed to provide protection of the entire branch circuit.
- (2) A listed branch/feeder-type AFCI installed at the origin of the branch circuit in combination with a listed outlet branch-circuit-type AFCI installed on the branch circuit at the first outlet box, which shall be marked to indicate that it is the first outlet of the branch circuit.
- (3) A listed supplemental arc protection circuit breaker installed at the origin of the branch circuit in combination with a listed outlet branch-circuit-type AFCI installed on the branch circuit at the first outlet box if all of the following conditions are met:
  - a. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit AFCI.
  - b. The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft) for a 14 AWG conductor or 21.3 m (70 ft) for a 12 AWG conductor.
  - c. The first outlet box shall be marked to indicate that it is the first outlet of the branch circuit.
- (4) A listed outlet branch-circuit-type AFCI installed on the branch circuit at the first outlet in combination with a listed branch-circuit overcurrent protective device if all of the following conditions are met:
  - a. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit AFCI.
  - b. The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft) for a 14 AWG conductor or 21.3 m (70 ft) for a 12 AWG conductor.
  - c. The first outlet box shall be marked to indicate that it is the first outlet of the branch circuit.
  - d. The combination of the branch-circuit overcurrent device and outlet branch-circuit AFCI shall be identified as meeting the requirements for a system combination-type AFCI and listed as such.
- (5) If metal raceway, metal wireways, metal auxiliary gutters, or Type MC or Type AC cable meeting the applicable requirements of 250.118, with metal boxes, metal conduit bodies, and metal enclosures are installed for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a listed outlet branch-circuit-type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.
- (6) Where a listed metal or nonmetallic conduit or tubing or Type MC cable is encased in not less than 50 mm (2 in.) of concrete for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, it shall be permitted to install a listed outlet branch-circuit-type AFCI at the first outlet to provide protection for the remaining portion of the branch circuit.

(7) A listed outlet branch-circuit-type AFCI installed on the branch circuit at the first outlet in combination with a listed branch-circuit overcurrent protective device if all of the following conditions are met:

- a. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit AFCI.
- b. The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 15.2 m (50 ft) for a 14 AWG conductor or 21.3 m (70 ft) for a 12 AWG conductor.
- c. The first outlet box shall be marked to indicate that it is the first outlet of the branch circuit.
- d. The service equipment or enclosure housing the branch circuit overcurrent protective device is located on a different floor or level from the room being protected that reaching the branch circuit overcurrent protective device from the room being protected requires traversing stairs, steps, or ramps.
- d. The outlet branch-circuit-type AFCI is installed on the same floor or level as the room being protected.

Informational Note: See UL 1699-2011, *Standard for Arc-Fault Circuit-Interrupters*, for information on combination-type and branch/feeder-type AFCI devices. See UL Subject 1699A, *Outline of Investigation for Outlet Branch Circuit Arc-Fault Circuit-Interrupters*, for information on outlet branch-circuit type AFCI devices. See UL Subject 1699C, *Outline of Investigation for System Combination Arc-Fault Circuit Interrupters*, for information on system combination AFCIs.

**Supporting data and documents (attach additional information as needed):** Please see attached documents referenced above.

[https://portal.ct.gov/-/media/dph/injury-and-violence-prevention/injuryfactsheets/2021-falls-factsheet-final\\_110122.pdf](https://portal.ct.gov/-/media/dph/injury-and-violence-prevention/injuryfactsheets/2021-falls-factsheet-final_110122.pdf)

<https://portal.ct.gov/DPH/Health-Education-Management--Surveillance/The-Office-of-Injury-Prevention/Falls-Prevention-Program>

<https://www.esfi.org/esfi-afci-and-gfci-performance-survey/>