

Proposal Number: 2018-OA-022

Rule 26-656 - New

Description of Change: Increased AFCI requirements in dwelling units

Proposed by: Electro Federation Canada

Background:

OESC2015 Rule 26-724(f) and (g) is re-numbered as 26-656 in CE Code 2018. The industry has issued the proposal for changes, see the attachment.



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Tuesday, January-16-18

Electrical Safety Authority
155 Matheson Blvd West
Mississauga, Ontario, L5R 3L5

Attention:
Ted Olechna, Director Codes and Standards Support
Tatjana Dinic, Code Engineer

Subject: 2018 Code Proposal

Request: Amend Rule 26-656 as shown:

26-656 Arc fault protection of branch circuits for dwelling units (see Appendix B)
Arc-fault protection of branch circuits for dwelling units shall meet the following requirements:

- 1) Except as permitted by Item 2), each branch circuit supplying 125 V receptacles rated 20 A or less shall be protected by a combination-type arc-fault circuit interrupter. ~~except for branch circuits supplying~~
 - a) ~~receptacles installed in accordance with~~
 - ~~i) Rule 26-720 f) provided no other receptacles are connected to these circuits; or~~
 - ~~ii) Rules 26-720 d), 26-724 d) i), iii), iv), and v); and~~
 - b) ~~a single receptacle for a sump pump where~~
 - ~~i) the receptacle is labelled in a conspicuous, legible, and permanent manner identifying it as a sump pump receptacle; and~~
 - ~~ii) the branch circuit does not supply any other receptacles.~~
- 2) ~~Notwithstanding Subrule 1), t~~ Ihe entire branch circuit need not be provided with arc-fault protection where

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Rationale:

During the development of the Arc-Fault Circuit Interrupter (AFCI) requirements for the 2015 CE code, Dr. Joel Moody of the Ontario’s Electrical Safety Authority analyzed the Ontario Office of the Fire Marshall’s (OFM) data for losses from fires where the fuel of the ignition source was reported as electricity for single residential dwellings from 2000 to 2011. The OFM data indicated 11 different ignition sources within the electrical system that caused the fires. The data also suggests that the risk of fire by six of the ignition sources listed may have been reduced or eliminated by employing AFCI protection.



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Table 1

Source: Office of the Fire Marshal Ontario 2000-2011 data

Ignition Source		Number	Percent
Circuit Wiring - Aluminum (including conductors)	✓	123	2.6%
Circuit Wiring - Copper (including conductors)	✓	1375	29.3%
Cord, Cable for Appliance, Electrical Articles	✓	704	15.0%
Distribution Equipment (includes panel boards, fuses, circuits)		573	12.2%
Extension Cord, Temporary Wiring	✓	541	11.5%
Meter		75	1.6%
Other Electrical Distribution Item		416	8.9%
Service/Utility Lines (includes power/hydro transmission lines)		252	5.4%
Terminations - Aluminum (includes receptacles, switches, lights)	✓	96	2.0%
Terminations - Copper (includes receptacles, switches, lights)	✓	520	11.1%
Transformer		21	0.4%
Total		4696	100%

As shown in the table 2, unlike the National Electrical Code (NEC) in the US that slowly increased AFCI requirements with each edition, the Canadian Electrical Code has not kept pace since the 2002 requirements.

Table 2

YEAR	NEC AFCI Requirements	CE Code AFCI Requirements
1999	Bedroom Receptacles	
2002	All Branch circuits in bedrooms including lighting and smoke alarms	Branch circuits that supply receptacles installed in sleeping facilities
2008	Branch circuits for family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sun rooms, recreation rooms, closets, hallways, or similar rooms or areas	
2011	Extension, modifications of branch circuits, or replacement of receptacles	
2014	All Branch circuits	
2015		Branch circuit supplying 125 V receptacles rated 20 A or less (except kitchen counters and refrigerators, bathrooms, and sump pumps)
2018		Smoke alarms permitted



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The safety benefits of branch circuit ACFI protection are clear as demonstrated by the data provided in Table 1, in the reduction of residential fires where electrical distribution equipment is the source of ignition. The exemptions in the current rule represent a compromise that was reached at the Part I Subcommittee during the 2015 CE Code cycle, to gradually expand the ACFI protection coverage in Canadian homes (see Table 2) - there was no technical rationale for these exemptions.

Therefore, moving forward with the 2018 edition of the OESC the safety arguments and the benefits of expanding the ACFI protection remain. The next step to increase electrical safety ought to be taken by removing the exemptions that have been provided in the 2015 CE Code. If this proposal is accepted it will further place the OESC in step with the NEC in the speed with which the requirements for the adoption of ACFI protection have been undertaken, and will closer harmonize the requirements of the North American installation Standards.

We look forward to a positive response.

Yours truly

Antonio Rocha
Siemens Canada, Chair, Distribution Equipment Section

Behalf of, Distribution Equipment Product Section Members
ABB
Eaton
Schneider Electric Canada
Siemens Canada Ltd.

CC
Eshan Behboudi, Eaton, Vice Chair, Distribution Equipment Product Section
Keith Rodel, Hubbell Canada, Chair, EEMAC Policy Advisory Committee
Carol McGlogan, CEO, Electro-Federation Canada
Rob McIntyre, Electro-Federation Canada



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Appendix

Appendix A

The following chart demonstrates the cost assessment for the typical house or condo unit. While most contractors receive lower pricing, this cost assessment represents the retail cost and can be verified through the Home Depot.

Cost	AFCI Requirements
\$360	Dual Function (DF) AFCI - \$95 https://www.homedepot.ca/en/home/search.html?q=dual%20function%20circuit%20breaker#!q=dual%20function%20circuit%20breaker <ul style="list-style-type: none">• 2 x DF in the kitchen- \$190• 1 x DF in the bathroom - \$95• 1 x Arc fault for the fridge - \$75 https://www.homedepot.ca/en/home/search.html?q=arc-fault#!q=arc-fault
Subtract Exceptions	
- \$100	<ul style="list-style-type: none">• 4 Breakers at \$10 each• 3 GFCI receptacles at \$20 each
Total Cost: \$260	

Appendix B

The follow chart demonstrates the cost assessment for the typical house or condo unit when contractors make large volume purchases.

Large Volume Cost	AFCI Requirements
\$187.20	<ul style="list-style-type: none">• Dual Function (DF) AFCI• 2 x DF in the kitchen• 1 x DF in the bathroom• 1 x Arc fault for the fridge
Subtract Exceptions	
-\$52	<ul style="list-style-type: none">• 4 Breakers• 3 GFCI receptacles
Contractor Total: \$135.20	