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TO: House Regulatory Reform Committee

FM: Lee Schwartz, Executive Vice President for Government Relations
Home Builders Association of Michigan

RE: Arc-Fault Circuit Interrupters and the Michigan Residential Code.

I'm writing to explain why the Home Builders Association of Michigan opposes the effort to overturn the reasoned decisions of both the Michigan Residential Code Review Committee and the Director of the Department of Licensing and Regulatory Reform to remove the requirement for arc-fault circuit interrupters from the 2015 Michigan Residential Code (the Code).

AFCIs were first required on all branch circuits serving bedrooms in the 2003 Michigan Residential Code. Since then **both** the Granholm and Snyder Administrations have rejected attempts to expand the mandated use of AFCIs in new homes as unnecessary and unsupported.

The Regulatory Impact Statement for the 2015 Michigan Residential Code states: "*The (2003) Michigan Residential Code requirement for arc-fault circuit interrupters (AFCIs) on all branch circuits serving bedroom outlets was justified solely on the basis of its inclusion in the NEC and the IRC. **No Michigan-specific fire data was ever provided for this code requirement. There has been a persistent and ongoing failure to provide an accurate fire analysis or cost benefit analysis to support requiring these devices in bedrooms of new homes.***"

Four separate Michigan-specific studies were conducted over a cumulative twelve-year period (2002-2013) using National Fire Incident Reporting system data. These studies, which used only structural fires involving electrical branch circuits or outlet receptacle fires in one- and two-family homes, the type of fires AFCIs are said to prevent, found:

- In the 12 years covered by the studies only one civilian death occurred in a fire caused by electrical arcing. This tragic death took place in Iron Mountain in 2013 where a 66-year-old man died from smoke inhalation. The house involved in the fire was built in the 1940s and it is not known if there were working smoke alarms in the house. (A 2008 National Fire Protection Association study found: "*The chances of surviving a reported home fire when working smoke alarms are present are 99.45%*")
- Michigan has over three and a half million one- and two-family dwellings. The average number of arcing fires in those homes over that 12 year period was 24.8 per year which equals 0.00071% of all homes.
- There were only two civilian injuries during that twelve-year period, an average of 0.16 injuries per year.
- The average annual total damage from this type of fire in both property and contents adjusted to 2013 dollars was \$828,726.20.

The National Fire Protection Association has produced its own analysis of electrical fires from 2007 through 2011. This analysis suffers from several major flaws.

- Rather than analyzing only fires involving electrical branch circuits or outlet receptacles, their analysis begins with an enumeration of all fires “*in which the factor contributing to ignition was some type of electrical failure or malfunction.*”
- Their analysis also includes fires caused by “*electrical failures in all other types of equipment as well as unclassified wiring, cords, lighting and other electrical distribution or lighting.*”

Most tellingly, their analysis does not limit itself to one- and two-family homes built under the requirements of the Michigan Residential Code. Instead, to try to support their case, they have broadened their parameters to include “*incident types 110-129 excluding 113-118,*” many of which would not be regulated under the Michigan Residential Code.

- Incident type 112 is **a fire in structure other than a building**. This includes fires on or in piers, quays, or pilings; tunnels or underground connecting structures; bridges, trestles or overhead elevated structures; transformers, power or utility vaults or equipment; fences.
- Incident type 121 is **a fire in mobile home used as a fixed residence**. This includes mobile homes when not in transit and used as a structure for residential purposes and manufactured homes built on a permanent chassis.
- Incident 122 is **a fire in a motor home, camper or recreational vehicle when used as a structure**. This includes motor homes when not in transit and used as a structure for residential purposes.
- Incident 123 is **a fire in a portable building when used at a fixed location**. This includes portable buildings used for commerce, industry or education and trailers used for commercial purposes.
- Incident type 120 is **a fire in any other mobile property used as a fixed structure**.

Their analysis also made:

- “*Adjustments*” based on population to compensate for the fact some fire departments did not report a high number of fires.
- “*Adjustments*” to compensate for the fact some fire departments did not report any fires in some or all years.”
- “*Adjustments*” to compensate for fires in “*which the factor contributing to ignition was unknown.*”
- “*Adjustments*” to compensate for fires “*in which the heat source was unknown.*”
- “*Adjustments*” to compensate for fires “*in which the factor contributing to the ignition was coded as none.*”

Their analysis not does specify what factors were used to make these “*adjustments*.” Their analysis does not explain how the factors used to make these “*adjustments*” were calculated. Even students in elementary schools are required to show their work.

This is not the first time proponents of mandatory AFCIs have provided erroneous data on residential fires in Michigan as rationalization for forcing these devices on the public. During the 2009 residential code promulgation process they inaccurately claimed: “*Per the National Fire Incident Reporting System (NFIRS), for calendar year 2009, Michigan has had 1,239 fires due to electrical arcing. This has resulted in 20 civilian deaths and 20 fire fighter injuries with total property and content loss of \$122,274,894.*”

In 2009 there were only 23 fires due to electrical arcing in one- and two-family homes. There were no civilian deaths. The total property and content damage from these fires totaled \$937,644.

Proponents of mandatory AFCIs seem to have a curious propensity for continuously “fuzzing the numbers” by citing national statistics which include all electrical fires, not just structural fires involving electrical branch circuits or outlet receptacle fires in one- and two-family homes.

While there may be one national model residential code, governmental units enforcing a residential code adopt thousands of amendments to fit the code to their needs including the use of significantly older codes. Many do not adopt a residential code at all. This patchwork of requirements allowing homes to be built to different standards make a comparison of fire data gathered outside Michigan irrelevant to our decisions in this state.

Perhaps the biggest deficiency surrounding fire data gathered through the National Fire Incident Reporting System is that it does not contain any information of the age of the home.

Volume 10, Issue 7 of the U.S. Fire Administration’s Topical Fire Report Series reported “*A strong relationship between housing age and the rate of electrical fires has been observed, with housing over 40 years old having the strongest association with electrical distribution fires. As of 2007, the median age of one- and two-family housing was over 35 years. With half of this housing stock older than 35 years, electrical issues become an increasing large player in residential fires.*”

According to a 1990 Consumer Product Safety Commission Epidemiological study, “*Residential Electrical Distribution System Fires,*” 85% of all such fires involved housing over 20 years old.

A study by Harvard University’s Center for Risk Analysis entitled “Residential Building Codes, Affordability, and Health Protection: A Risk-Tradeoff Approach” found “*The mortality risk from house fires is clearly higher in older homes.*” Another study in North Carolina reported on in the *New England Journal of Medicine* found the fatality rate per fire to be 100% greater in homes 20 years or older than in newer homes.

Seventy-one per cent of Michigan’s housing units were built before 1990. Fully 13.5 percent of Michigan’s housing stock was built before 1939. The median age of Michigan’s housing is 36 years. Only 15.3% percent of Michigan’s housing has been built since 2000. Without knowing the approximate age of the home a fire occurred in, it is almost impossible to make a cogent determination on the need for commanding the inclusion of AFCIs in new home construction.

The NFPA analysis charges the National Association of Home Builders with focusing “*only on fires in which branch circuit wiring and outlet receptacles were the equipment involved in ignition. ... (excluding) unclassified wiring, lighting, other electrical distribution or lighting equipment ... electrical failures, arcing in appliances or other items plugged into the outlet*” and with “*making no adjustments for fires with unknown data.*” Our studies analyze the effect of a specific code change and include only the fires that were relevant for that purpose, not piers, campers, tunnels, utility vaults or portable buildings.

Among the many deficiencies in the “*Fact Sheet*” prepared by AFCI proponents it that it contains the erroneous statement: “*The Home Builders Association of Michigan (HBAM) thinks AFCIs are too costly to add to new homes.*” **The Home Builders Association of Michigan is opposed to the imposition of compulsory AFCI requirements because they are unnecessary and no accurate Michigan-specific data has ever been provided to substantiate a need** (see the Regulatory Impact Statement above). The cost of complying with a superfluous mandate is important but secondary to that consideration.

While questions regarding construction code requirements intended to increase the safety of homes cannot and should not be decided solely on the issue of cost, it is reasonable to ask if there is a demonstrated Michigan-specific need for the requirement or if an acceptable level of safety can be achieved through other, less expensive means. The cost of an incremental increase in the margin of safety can be quite high.

The Michigan Residential Code is intended to be a minimum code with affordability as one of its key purposes. State law prohibits the code from containing "*unnecessary construction regulations that tend to increase construction costs.*"

One million, one hundred seventy-nine thousand Michigan families cannot afford to buy a home costing more than \$100,000. Another eight hundred and twenty thousand cannot afford a home priced above \$175,000.

Attached you will find a breakdown by SMSA of the number of Michigan families who are priced out of a home by every \$1,000 increase in cost.

The total annual cost to home buyers if the proposed ACFI requirement found in these rules had been in effect ranged between \$9 million to \$16.5 million, depending on the number of homes built and size of the home.

Mandating costly incremental increases in safety will only protect those who can afford them and will often decrease safety for those who cannot. Families who cannot qualify to purchase homes due to the increased costs of mandatory code requirements such as AFCIs will have to live in housing that is less safe because that housing was built to less stringent code requirements.

These older homes, such as the one involved in the terrible Iron Mountain fatality in 2013, can have building materials, space heaters, faulty wiring, or other characteristics that might lead to a greater risk of a fire starting along with structural inadequacy, or lesser ease of exit which increase the chances of dying in that fire.

Even as homes built to today's Michigan Residential Code get older, they will continue to provide protection for families through their improved fire separation, fire blocking and draft stopping, emergency escape and rescue openings, electrical circuit breakers, capacity and outlet spacing, reduced need for space heating and enhanced means of egress.

Proponents of AFCIs often use the argument "*They'd only spend the money on a granite countertop anyway,*" to justify including questionable requirements in the code. They often state the cost of these devices would only run \$300. Based on actual estimates obtained for the inclusion of AFCIs we believe this severely understates the potential cost of this requirement.

Taking away a homebuyer's choice in how to spend their money means they lose the ability to use that money in other ways they have decided would better increase the quality of life for themselves and their families.

Dollars involuntarily spent on unjustified requirements won't be available for improved medical care, better insurance, a safer and more fuel-efficient car, education expenses, retirement accounts, charitable giving, physical fitness activities or even upgrades such as a higher efficiency furnace in the home.

On behalf of the Home Builders Association of Michigan, I want to thank you for your careful consideration of the information presented in this memo. If you have any questions about this issue, or if the Association can be of help to you in any other way, please do not hesitate to contact me. My direct line is 517-646-2565. My cell number is 517-582-4000. My email is lee@hbaofmichigan.com.