

Proposed Meeting Agenda- REVISED
SOUTH DAKOTA ELECTRICAL COMMISSION
via [Microsoft Teams](#)

Meeting ID: 227 498 631 631 | Passcode: ymLoVY
or Call +1 605-679-7263 ID 458 803 286
Tuesday, August 27, 2024, at 9:00 a.m. CDT

- A. Call to Order
- B. Approval of Agenda
- C. Approval of July 29 Minutes
- D. Public Comment
- E. Rules Hearing
 - a. Public Comment
 - b. Written Comment
 - c. Board Discussion
- F. Proposed Fee Increases**
- G. Adjournment

Meeting Minutes
SOUTH DAKOTA ELECTRICAL COMMISSION
Microsoft Teams Meeting
July 29, 2024, 10:30 a.m. CDT

Doug made a motion to appoint Tor Sorlien as acting president for the meeting. Dave Eide seconded the motion. **MOTION PASSED.**

Tor Sorlien called the meeting to order at 10:34 a.m. A quorum was present.

Members Present: Dave Eide, Doug Fuerst, Tor Sorlien, Bob Jarding

Members Absent: Rick Cronin, Sean Lyons, Stephen Burgess

Others Present: Pamela Overweg - program director, Jerry McCabe - DLR division director, Brent Schoulte - lead inspector, Jodi Aumer - director of professional licensing, Larry Kippes – chief electrical inspector for the City of Sioux Falls

Bob Jarding made a motion to approve the agenda. Dave Eide seconded the motion. **MOTION PASSED.**

Doug Fuerst made a motion to approve the April 26 meeting minutes. Bob Jarding seconded the motion. **MOTION PASSED.**

Doug Fuerst nominated Tor Sorlien as the new board president. Bob seconded the motion. **MOTION PASSED.**

Doug Fuerst nominated Bob Jarding as board secretary. Dave Eide seconded the motion. **MOTION PASSED.**

Director Overweg informed the commission there was an upcoming IAEI Western Section meeting in Arkansas and multiple inspectors expressed interest in attending. Dave Eide made a motion to send the lead inspector plus two more inspectors. Bob Jarding seconded the motion. **MOTION PASSED.**

Director Overweg informed the commission that fee increases are being considered for the upcoming legislative session across all boards and commissions. A new possible sliding scale fee schedule was introduced and discussed. Director Overweg will bring back more information regarding the current schedule and the proposed schedule to the commission at the August meeting.

President Sorlien opened the floor for public comment. Larry Kippes thanked the board for their work and spoke in favor of the commission continuing to send inspectors to the IAEI meetings to keep them educated.

Director Overweg advised the commission on the change in her title from executive director to program director to keep in line with BHR designations. Director Overweg updated the commission on the progress of the new database. Licensing did go live in May, but the commission is in renegotiations regarding the remainder of the database.

Brent Schoulte updated the commission on the number of active permits and the positive comments regarding the newest inspectors that have been hired. The electrical commission is currently fully staffed for inspectors.

The next commission meeting is scheduled for Aug. 27, 2024, with plans to hold a public hearing on the proposed rule changes. The next quarterly board meeting is tentatively scheduled for Oct. 8.

Doug Fuerst made a motion to adjourn the commission meeting. Bob Jarding seconded the motion. **MOTION PASSED.** The meeting adjourned at 11:29 a.m.

DRAFT

20:44:14:01. General definitions. Terms defined in SDCL 36-16-2 have the same meaning as in this article. As Terms used in this article mean:

(1) "Commission," means the State Electrical Commission;

~~(2) "Inspector's report procedure" means a procedure that requires the installer to notify the inspector regarding the status of the corrections required, as listed on an inspector's report by the day specified;~~

~~(3)(2) "Correction order," means a notice written by an inspector to the person responsible for the electrical installation, listing the violations of this article and stating the time allowed for correction;~~

~~(4)(3) "Electrical lineman," means a person with a minimum of four years of experience with electrical power distribution systems;~~

~~(5)(4) "Electrical school," as referred to in SDCL 36-16-2(4), means a four-year educational institution which that grants an a Bachelor of Science degree in electrical engineering degree (BSEE) and which is accredited by a nationally recognized accreditation agency;~~

~~(6)(5) "Electrical wiring apprenticeship program," means—a classroom program supplemented by a minimum of 144 one hundred forty-four hours per year of electrical wiring instruction in conjunction with the normal 2,000 two thousand hours per year of actual electrical wiring on-the-job work experience of an apprentice electrician;~~

~~(7)(6) "Final subject," means the act of closing out a non-compliant residential installation after all inspections have been performed and the residence owner of the installation acknowledges acceptance of the report of non-compliance;~~

~~(8)(7)~~ "Final void," ~~means~~ the act of closing out a non-compliant installation prior to the full inspection being completed;

(8) "Inspector's report procedure," a procedure that requires the installer to notify the inspector regarding the status of the corrections required, as listed on an inspector's report, by the day specified;

(9) "License," ~~means~~ a ~~license~~ credential issued to a person who qualifies under one of the classes defined in SDCL 36-16-2 or is granted reciprocity from another state;

(10) "Local inspection system," ~~means~~ a municipal government or power supplier that has complied with commission requirements, and which provides local electrical inspections under the rules and direction of the commission and SDCL chapter 36-16;

(11) "Modular home" or "modular structure," ~~means~~ a home or other structure ~~built~~ that:

(a) Is built on a factory assembly line or other construction site to International Building Code, 2021 Edition, specifications and ;

(b) Is transported to its destination in sections or as a complete assembly, ~~which has~~ ;

(c) Has no permanent steel chassis attached; and ~~is~~

(d) Is not a manufactured home, as defined in SDCL 32-7A-1, or a recreational vehicle;

(12) "National Electrical Code," ~~means~~ the code published by the National Fire Protection Association (2020-2023 edition, including tentative interim amendments 23-1 through 23-15) with the following exceptions:

(a) ~~Sections~~ Section 210.8(F) ~~and 230.67;~~

- (b) Article 100 – definitions - remove the ~~new word term~~ "machinery" from the definition of "equipment";
- (c) ~~The words "through 250-volt" are changed to ", single-phase, 15- and 20-ampere" in section 210.8(A);~~ Properly labeled recreational vehicle (RV) receptacles other than 125-volt, single-phase, fifteen- and twenty- ampere receptacles are exempt from ground-fault circuit interrupter (GFCI) requirements in section 210.8(A);
- (d) Eliminate the GFCI and AFCI arc-fault circuit interrupter (AFCI) requirement for life support equipment and like or similar equipment as determined by ~~Authority Having Jurisdiction~~ the authority having jurisdiction; and
- (e) Clarify section 334.10. Uses permitted. Type NM, Type NMC, and Type NMS cables may be used in the following structures:
 - (i) One- and two-family dwellings and accessory structures;
 - (ii) Multifamily dwellings, farmsteads, and accessory structures of Types III, IV, and V construction, except as prohibited in section 334.12; and
 - (iii) Other structures permitted to be of Types III, IV, and V construction, ~~except as prohibited in section~~ section 334.12. Cables ~~shall~~ must be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a ~~15~~ fifteen-minute thermal finish rating as identified in listing of fire-rated assemblies;~~and~~

~~(f) The words "a zone measured 900 mm (3 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and shall include the space" are changed to "or" and the words "the tub" are changed to "a bathtub" in section 406.9(c);~~

(13) "Owner's exemption," means an exemption from licensure requirements in SDCL 36-16-13 for an individual owner who is personally wiring an electrical installation on a residence or farmstead as described in SDCL 36-16-15;

~~(14) "Point of service attachment," as referred to in SDCL 36-16-16(1), means that point where the power supplier's conductors connect to the consumer's conductors;~~

~~(15)~~(14) "Wiring permit," means a form notifying the commission that a described electrical installation will be made in accordance with the requirements of this article at a described location;

~~(16) "Wiring permit Form B" means a wiring permit to be used in an area where the commission has approved local inspection systems; and~~

~~(17)~~(15) "Wiring school," means a postsecondary school that teaches one or more courses in electrical wiring which covers covering the topics listed in § 20:44:16:12 and includes at least ~~576~~ five hundred seventy-six hours of instruction on those topics.

Source: SL 1975, ch 16, § 1; 4 SDR 37, effective January 1, 1978; 5 SDR 1, effective July 20, 1978; 7 SDR 60, effective January 1, 1981; 10 SDR 62, effective January 1, 1984; 10 SDR 131, effective June 3, 1984; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 13 SDR 75, 13 SDR 95, effective January 1, 1987; 16 SDR 153, effective March 29, 1990; 19 SDR 155, effective April 14, 1993; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:01:01, August 12, 1994; 23 SDR 2, effective July 16, 1996; 25 SDR 157,

effective July 1, 1999; 28 SDR 83, effective December 19, 2001; 28 SDR 178, effective July 1, 2002; 32 SDR 37, effective September 1, 2005; 34 SDR 322, effective July 1, 2008; 35 SDR 305, effective July 1, 2009; 37 SDR 236, effective June 29, 2011; 40 SDR 198, effective May 28, 2014; 43 SDR 181, effective July 10, 2017; 46 SDR 128, effective May 26, 2020; 46 SDR 146, effective June 30, 2020.

General Authority: SDCL 36-16-12.

Law Implemented: SDCL ~~36-16-12~~ 36-16-1.

References:

The **National Electrical Code**, ~~2020~~ 2023 Edition. National Fire Protection Association, Inc., ~~One~~ 1 Batterymarch Park, Quincy, MA 02169-7471. Cost: ~~\$108~~ \$145.50. (Price subject to change). Available for no cost at <https://www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards/Free-access>.

International Building Code, ~~2018~~ 2021 Edition, pages numbered numerically, International Code Council. Copies may be obtained from the International Code Council, Inc., 4051 West Flossmoor Road, Country Club Hills, IL 60478-5771. Cost: ~~\$136~~ \$192. Available for no cost at <https://codes.iccsafe.org/content/IBC2018P4>
<https://codes.iccsafe.org/content/IBC2021P2>.

20:44:16:24. Renewal of license. A maintenance electrician license holder must renew the license biennially prior to the license expiration date and must request inspection or waiver of inspection of electrical work prior to renewal. The application for renewal of a maintenance electrician's license must contain a statement that the ~~applicant~~ holder assumes all risk, liability, and responsibility for electrical work done by ~~its~~ the holder's employees and must be accompanied by a renewal fee of ~~\$80~~ eighty dollars. All electrical violations found by an inspection must be corrected before the commission renews the ~~entity's~~ holder's maintenance electrician license.

The commission may waive inspection if the commission receives written confirmation that no maintenance work has occurred in the preceding two years or receives an inspection report of maintenance electrical work from a qualified third party that has inspection authority over the maintenance ~~licensee~~ license holder that is recognized by the commission, as defined in §20:44:23:05.

~~A qualified third party is not a state or local electrical inspector but must have similar qualifications and must conduct electrical inspections following the National Electrical Code as defined in subdivision 20:44:14:01(12). Persons applying to the commission for approval as qualified third parties must submit applications listing their qualifications on forms provided by the commission.~~

Source: 23 SDR 236, effective July 16, 1997; 43 SDR 181, effective July 10, 2017; 48 SDR 23, effective September 15, 2021.

General Authority: SDCL 36-16-12, ~~36-16-13.2~~, 36-16-17.

Law Implemented: SDCL 36-16-13.2, 36-16-17.

Cross-References:

Electrical experience for advancement, § 20:44:16:08.

Local inspection systems, ~~en~~ chapter 20:44:21.

20:44:18:01. Wiring permit required. The following ~~electrical installations and electrical service entrances~~ require a wiring permit:

(1) ~~All~~ Any electrical service ~~entrances~~ entrance. A single wiring permit may be used for a temporary electrical service and a new service on a single project when both are installed by the same contractor, which must be stated on the wiring permit at the start of the project. Separate wiring permits are required if more than one contractor is involved; ~~and~~

(2) ~~Electrical wiring being performed under an owner's exemption; and~~

~~All~~ Any other electrical ~~installations~~ installation with a calculated inspection fee of ~~\$10~~ ten dollars or greater ~~require~~ requires a wiring permit and minimum electrical inspection fee, ~~as required by § 20:44:20:02.01 of~~ of no less than one hundred dollars or a specific fee as provided by chapter 20:44:20, or exclusions not requiring unless a wiring permit is not required and noted under the provisions of article 20:44 and SDCL chapter 36-16.

Source: SL 1975, ch 16, § 1; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 13 SDR 75, 13 SDR 95, effective January 1, 1987; 20 SDR 92, January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:04:01, August 12, 1994; 32 SDR 37, effective September 1, 2005; 37 SDR 236, effective June 29, 2011.

General Authority: SDCL 36-16-12.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:02. Inspection fees and rough-in inspections for service connections on other electrical installations. Inspection fees for electrical service connections ~~on~~ and associated rough-in inspections are as follows:

~~_____~~ (1) On new installations, including new service installations on commercial installations and new service installations not covered in this chapter, ~~are and~~ based on service equipment ampere capacity ~~as follows~~:

~~(1)~~(a) 0 through 200 amperes: ~~\$60~~ sixty dollars plus circuits, and includes one rough-in inspection;

~~(2)~~(b) 201 through 400 amperes: ~~\$75~~ seventy-five dollars plus circuits, and includes one rough-in inspection;

~~(3)~~(c) 401 through 800 amperes: ~~\$100~~ one hundred dollars plus circuits, and includes one rough-in inspection;

~~(4)~~(d) 801 through 1600 amperes: ~~\$150~~ one hundred fifty dollars plus circuits, and includes one rough-in inspection; ~~and~~

~~(5)~~(e) 1601 amperes and over: ~~\$275~~ two hundred seventy-five dollars plus circuits, and includes two rough-in inspections; ~~and~~

~~Inspection fees for electrical service connections on~~ (2) On existing installations, including replacement service installations for existing homes, commercial installations, and installations not covered in this chapter, ~~are and~~ based on service equipment ampere capacity ~~as follows~~:

~~(1)~~(a) 0 through 200 amperes: ~~\$100~~ one hundred dollars plus new circuits;

~~(2)~~(b) 201 through 400 amperes: ~~\$125~~ one hundred twenty-five dollars plus new circuits;

~~(3)~~(c) 401 through 800 amperes: ~~\$150~~ one hundred fifty dollars plus new circuits;

(4)(d) 801 through 1600 amperes: ~~\$175~~ one hundred seventy-five dollars plus new circuits;
and

(5)(e) 1601 amperes and over: ~~\$200~~ two hundred dollars plus new circuits.

Fees for remodeling single family residences may not exceed the flat rate fee for comparable new single family residential electrical services in § 20:44:20:01. A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

____ In addition to the rough-in inspections set forth in this section, each installation under this section includes one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:02, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:03. Inspection fee for circuit installations or alterations. The inspection fee for circuit installations or alterations, including commercial installations, new installations in existing homes, and other installations not covered by this chapter, is ~~\$50~~ fifty dollars per circuit.

Any fee calculated in this section may not exceed the calculated fee for a new installation of the same type in §§ 20:44:20:01 and 20:44:20:02. A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars. A one- or two-circuit installation or alteration includes one inspection. An installation or alteration of three or more circuits includes two inspections. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:03, August 12, 1994; 32 SDR 37, effective September 1, 2005; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:04. Inspection fees for electrical installations associated with remodeling projects.

When neither the service nor the branch circuits are altered, inspection fees associated with a remodeling project, ~~including remodeling work in existing homes,~~ are as follows:

- (1) First ~~40~~ forty openings or connections: ~~\$2~~ two dollars each;
- (2) Each additional opening or connection: ~~\$0.50~~ fifty cents;
- (3) First ~~40~~ forty lighting fixtures: ~~\$2~~ two dollars each;
- (4) Each additional lighting fixture: ~~\$0.50~~ fifty cents; and
- (5) Each motor or other special equipment: ~~\$6~~ six dollars.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars. Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:04, August 12, 1994; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:05. Inspection fees for electrical installations in apartment buildings. ~~Inspection fees for apartment buildings are \$50-~~The inspection fee for an apartment building is fifty dollars per unit.

If each apartment is served individually, the service is included in the flat rate fee. All other service entrances are subject to § 20:44:20:02 and all other circuits and feeders are subject to § 20:44:20:02.01. A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit for an apartment building includes one rough-in inspection per ~~4~~ four units and one final inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:05, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:06. Inspection fees for electrical installations serving outdoor signs and area lighting. The inspection fee for outdoor sign feeders or branch circuits and for area lighting is calculated as follows:

(1) For each outdoor sign ~~feeders~~ feeder or branch ~~circuits~~ circuit, the greater of (a) or (b), as follows:

(a) ~~\$50 fifty dollars for each outdoor sign feeder or branch circuit~~; or

(b) The fee calculated in accordance with §§ 20:44:20:02 and 20:44:20:02.01, with a maximum of ~~\$60 sixty dollars~~; and

(2) For area lighting used to illuminate large outdoor spaces, the fee calculated in ~~accordance~~ accordance with §§ 20:44:20:02 and 20:44:20:02.01, with a maximum of ~~\$60 sixty dollars for each light fixture~~.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 16 SDR 153, effective March 29, 1990; 18 SDR 83, effective November 10, 1991; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:06, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:07. Inspection fees for electrical installations serving field irrigation systems.

Inspection fees for electrical installations serving field irrigation systems are as follows:

(1) The inspection fee for an irrigation system, which includes one irrigation machine, either pipe or pivot, that is supplied by one main or booster pump and one electrical service, is ~~\$75~~ seventy-five dollars plus \$2 two dollars for each motor, except for the motor driving the pivot;

(2) The inspection fee for a pumping station is computed in accordance with §§ 20:44:20:02 and 20:44:20:02.01;

(3) The inspection fee for a diesel-driven water pump, at which the diesel also drives an electric generator for power and controls, is computed in accordance with § 20:44:20:10;

(4) The inspection fee for an addition to or replacement of an electrically driven pivot on an existing system is computed in accordance with § 20:44:20:10; and

(5) The inspection fee for a range well must be charged as a requested inspection according to § 20:44:20:10 and billed for each inspection hour or fraction of an hour.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit under this section includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a rough-in or final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:07, August 12, 1994; 32 SDR 37,

effective September 1, 2005; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:08. Inspection fees for mobile home services and feeders. The inspection fee for services to each mobile home service or feeder, whether on or off a mobile home court, is as follows:

- (1) First unit: ~~\$75~~ seventy-five dollars;
- (2) Each additional unit: ~~\$35~~ thirty-five dollars.

One wiring permit may apply to an entire mobile home court if the number of lots included is specified on the wiring permit before it is sent to the commission office.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Each permit under this section ~~will receive~~ includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for a final inspection may be assessed fees under § 20:44:20:10.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 10 SDR 131, effective June 3, 1984; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:08, August 12, 1994; 32 SDR 37, effective September 1, 2005; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:09. Inspection fees for electrical installations at recreational vehicle parks. The inspection fee is ~~\$20~~ twenty dollars for each recreational vehicle park unit pedestal. A minimum fee of one hundred dollars is imposed if the total fee calculated under this section is less than one hundred dollars. Each permit under this section ~~shall receive~~ includes one inspection. Additional requested inspections or reinspections to address corrections detailed in a report for an inspection may be assessed fees under § 20:44:20:10.

The service to the recreational vehicle park itself is computed under § 20:44:20:02.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 7 SDR 90, effective April 1, 1981; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 16 SDR 153, effective March 29, 1990; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:09, August 12, 1994; 37 SDR 236, effective June 29, 2011; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

20:44:20:10. Minimum fee for requested electrical inspections or for reinspections. A minimum inspection fee of ~~\$75 for residential and \$100 for commercial~~ one hundred dollars for each inspection man-hour or fraction of a man-hour is charged for any requested electrical inspections or any reinspections to address corrections detailed in a report for a rough-in or final inspection. After the first hour, the fee for each additional fifteen minutes is twenty-five dollars. Inspector time is rounded to the nearest fifteen-minute increment.

Source: SL 1975, ch 16, § 1; 2 SDR 89, effective July 2, 1976; 7 SDR 90, effective April 1, 1981; 12 SDR 92, effective January 1, 1986; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 92, effective January 1, 1994; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:06:10, August 12, 1994; 32 SDR 37, effective September 1, 2005; 43 SDR 181, effective July 10, 2017; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL ~~36-16-12~~, 36-16-27, 36-16-29, 36-16-30.

20:44:22:07. Residential heating plant disconnect. Heating plant installations that include auxiliary motor-operated equipment rated ~~25~~ twenty-five amps or less require a ~~disconnect on the unit~~ separate disconnecting means from the branch-circuit overcurrent protective device. The disconnect must be located at the unit and readily accessible from the service compartment.

Source: SL 1975, ch 16, § 1; 12 SDR 151, 12 SDR 155, effective July 1, 1986; transferred from § 20:44:05:07, August 12, 1994; 29 SDR 87, effective December 24, 2002; 43 SDR 181, effective July 10, 2017; 48 SDR 23, effective September 15, 2021.

General Authority: SDCL 36-16-12, 36-16-27.

Law Implemented: SDCL 36-16-27.

Note: Also see Article 424 of the **National Electrical Code**.

CHAPTER 20:44:23

MODULAR HOMES AND STRUCTURES

Section

20:44:23:01 Modular homes and modular structures -- Compliance with requirements.

20:44:23:02 Wiring permit required for modular homes and modular structures.

20:44:23:03 Inspection of modular homes and modular structures.

20:44:23:04 Inspection fees for modular homes and modular structures.

20:44:23:05 Third-party inspection.

20:44:23:05. Third-party inspection. The commission office may approve an individual or multiple individuals at a business entity as a third-party inspector to conduct inspections of modular homes and modular structures under subdivision 20:44:23:03(4). A third-party inspector shall have similar qualifications to a state-licensed electrical inspector and shall conduct electrical inspections in accordance with SDCL chapter 36-15 and this article.

An individual or multiple individuals at a business entity seeking approval by the commission to conduct third-party inspections must submit an application in the format designated by the commission office. An initial or renewal application must include:

- (1) A list of modular home and modular structure manufacturers in South Dakota with which the third party has contracted;
- (2) A list of jurisdictions in which the third party presently performs any inspections, including any supporting documentation;
- (3) A list of all individuals who will be conducting the inspections and their qualifications;
- (4) Certificate of liability insurance of at least one million dollars;

(5) Copy of accreditation with a nationally recognized testing laboratory as defined by 29 C.F.R. § 1910.7 (January 1, 2024); and

(6) Surety bond of one hundred thousand dollars.

An approval for a third party to conduct inspections is valid for two years and only for the individuals identified in the most recent application. A renewal application shall be submitted every biennium on the form designated by the commission office.

Source:

General Authority: SDCL 36-16-12.

Law Implemented: SDCL 36-16-27, 36-16-29

20:44:24:05. Minimum inspection fee. Inspection fees for carnivals or celebrations are charged to the owners and concessionaires in accordance with the following schedule:

(1) ~~—\$10~~ ten dollars for each ride or concession, or for a single concession generator or transformer;

(2) ~~—\$10~~ five dollars for reinspection of each unit, if required; and

(3) ~~—\$10~~ thirty dollars for inspection of transformers or generators.

A minimum fee of one hundred dollars must be imposed if the total fee calculated under this section is less than one hundred dollars.

Source: SL 1975, ch 16, § 1; 5 SDR 1, effective July 20, 1978; 12 SDR 151, 12 SDR 155, effective July 1, 1986; 20 SDR 222, effective July 6, 1994; transferred from § 20:44:09:05, August 12, 1994; 43 SDR 181, effective July 10, 2017; 46 SDR 128, effective May 26, 2020.

General Authority: SDCL 36-16-12, 36-16-30.

Law Implemented: SDCL 36-16-27, 36-16-29, 36-16-30.

Proponent Testimony



July 15, 2024

RE: South Dakota Adoption of the 2023 NEC

Dear Commissioners

The National Electrical Manufacturers Association (NEMA) provides this letter as testimony in support of the adoption of the 2023 Edition of NFPA 70, National Electrical Code without amendments to electrical safety.

The 2023 Edition of the NEC increased the electrical fire protection requirements for one- and family dwelling units and increased the electrical safety requirements for the inhabitants of those dwelling units through the expansion of arc-fault circuit interruption (AFCI), ground-fault circuit interruption (GFCI), and surge protective devices (SPDs). The 2023 Edition of the NEC also provides additional emergency safety shutdown requirements for residential power sources so fire fighters can safely remove all available sources of power from a dwelling unit.

The 2023 Edition of the NEC also included energy efficiency benefits for Electrical Vehicle (EV) charging equipment, Energy Storage Systems (ESS), PV Systems, and Microgrids using Energy Management System and Power Control System technologies.

Respectfully Submitted,
Brian Baughman
NEMA Midwest Technical Field Representative



NEMA VSP P2-2019

***Impact of Surges on Equipment:
Susceptibility of Electronics to Surge Damage***

Published by

National Electrical Manufacturers Association

1300 North 17th Street, Suite 900

Rosslyn, Virginia 22209

www.nema.org

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Foreword

This is a NEMA white paper based upon member supported testing. To ensure that a meaningful publication was being developed, draft copies were sent to a number of groups within NEMA having an interest in this topic. Their resulting comments and suggestions provided vital input prior to final NEMA approval and resulted in a number of substantive changes in this publication. This publication will be periodically reviewed by the Low Voltage Surge Protective Devices Group of the part of the NEMA Building Infrastructure Division for any revisions necessary to keep it up to date with advancing technology. Proposed or recommended revisions should be submitted to:

Technical Director, Operations
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
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This white paper was developed by the Low Voltage Surge Protective Devices Group of the part of the NEMA Building Infrastructure Division. Approval of this white paper does not necessarily imply that all members of the Product Group voted for its approval or participated in its development.

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The National Electrical Manufacturers Association (NEMA) provides information to assist with answering various questions related to the application and use of Surge Protective Devices (SPD).

Executive Summary:

The NEMA Low Voltage Surge Protective Devices, 5VS group, has been asked to provide an overview of electrical and electronic equipment surge susceptibility. Surges can damage, degrade, or destroy sensitive electronic equipment in offices or businesses. This results in equipment damage, equipment downtime, lost revenues, as well as productivity losses due to downtime. Robust circuit-protection technologies are essential to protect new capital assets in today's increasingly digitized world. Surge protection is a cost-effective solution to prevent downtime, improve systems and data reliability, and eliminate equipment damage due to surges for both power and signal lines.

The intent is not to evaluate the safety and/or product performance of companies installed electrical systems, but to create awareness and offer guidance based on real-world testing of protection that will help prevent problems with products.

Lightning is viewed as the most influential cause of a power surge, and rightly so. Insured losses on residential properties exceed \$1 billion dollars annually and \$4 billion dollars overall. But it is a common misconception that lightning is the only cause of surges. Although lightning is easily identified as a surge generator, there are other causes. These include utility grid switching, operator errors, as well as crossed and downed power lines. Manufacturers estimate that externally generated surges account for only about 20% of the surge/transient activity within a facility.

There are many internal causes of surges as well. Internal surges can be caused by the operation of contactors, relays, or breakers. The switching of capacitor banks, discharge of inductive devices, starting and stopping of any electric loads are also causes. Anytime the flow of electricity is altered or interrupted, surges will occur.

Quantitative data on the size or number of surges required to significantly reduce the life of, or cause failure of an electrical or electronic device is almost nonexistent. Reasons for this lack of information are the variable conditions to which an electrical device is subjected. Locations may have more or less consistent supply voltage, but how many times does it fluctuate? When it does change, for how long was the condition unstable? How large was the surge or the influence of another device or system? These questions are difficult to predict and analyze. However, 98% of engineers and contractors surveyed have encouraged the use of surge protection.

Another missing piece of information is data on the cumulative effect of surges. The average person usually believes that surge damage is a one-time event. When lightning strikes and a piece of equipment is damaged, that damage may be attributed to a surge. But when a piece of equipment fails due to the accumulation of numerous smaller magnitude surges, the failure is often attributed to the age of equipment, poor quality of the equipment, or other unexplained conditions.

Scope:

The purpose of this paper is to provide evidence showing all electrical products, sensors, and systems containing electronic components are at risk of suffering damage from electrical surges. This white paper is not meant to be an exhaustive study, nor a complete test spectrum. It is a way to provide useful information to the electrical community. Both for those who design electronic and electrical equipment and for those who install and use electronic and electrical equipment.

An increasing number of consumer products, machinery and systems feature sensitive electronics that need to be protected by SPDs. Some devices may show malfunctions or experience upset events caused by surge events in actual installations. Surges can damage, degrade, or destroy the sensitive electronic

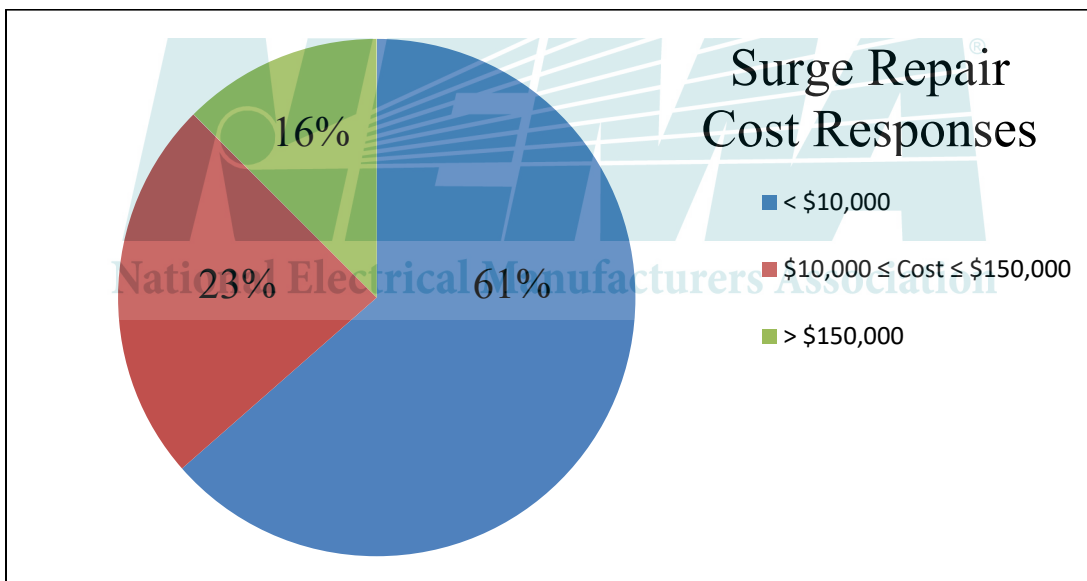
equipment in offices or businesses. This results in equipment damage, equipment downtime, lost revenues, and productivity losses due to downtime.

Surge Susceptibility Evidence:

In 2014, NEMA Business Information Services administered a survey to maintenance and facilities managers to gather data on surge damage that occurred at properties they oversee. A plurality (48%) of respondents noted that their facility had experienced unexplained process interruptions. Catastrophic failure or damage of electrical or electronic equipment due to a lightning event or voltage surge were both frequently reported, (41%) of events. More than a third (38%) noted the occurrence of a lockup to a computer or industrial process systems.

Additional findings include:

- a. A significant number (75%) experienced one or more incidents of damage because of voltage surges. Though the frequency of equipment damage arising from voltage surges is relatively low, most property managers have had to deal materially with surge damage;
- b. 61% of respondents said the cost was \$10,000 or less to repair the damage resulting from voltage surges;
- c. A sizable number (16%) reported damage repair costs in excess of \$150,000;



- d. All respondents who reported surge-damaged equipment also reported experiencing downtime as a result;
- e. The typical amount of lost time was greater than one hour and up to 12 hours; with 13% reporting downtime of greater than 48 hours; and
- f. The value of lost production was generally between \$1,000 and more than \$100,000, with the bulk of lost production (48%) between \$5,000 and \$50,000.

Nearly three-fourths of those reporting losses because of voltage surges indicated that at least some portion of those losses were covered by insurance. On average, insurers covered 65% of total equipment loss costs, 46% of total downtime costs, and 42% of the total costs of lost production. Some respondents' reported insurance covered 100% of the loss incurred.

Nearly 95% of those who reported having experienced a surge event resulting in equipment damage indicated that they subsequently purchased surge protection. Virtually all of those who did so purchased surge protection equipment immediately or within three months of the event.

Specific Products Affected:

Light Sources

Light sources have proven, in both real world and laboratory settings, to be vulnerable to power surges. This holds true for several types of lighting technologies, including incandescent, compact fluorescent, and LED. With the general migration to LED technology, it is important to note that it fares similarly to the other types. Building contractors and owners have invested hundreds of thousands of dollars in LED technology. Although they have some increased resistance to power surges, it is still extremely important to protect LEDs from power surges.

HVAC Equipment

People in the modern world cannot imagine working in environments without heating and air conditioning systems installed in the building where they work. It is simply taken for granted that a general level of comfort is expected. Installing, maintaining, and operating HVAC equipment can cost a building owner thousands of dollars upfront, and with that cost comes the risk that surges can damage and degrade the equipment. Surge protective devices can be a cost-effective way to protect and extend the life of the investment.

Uninterruptible Power Supplies (UPS)

These products act as an auxiliary power source for many applications and businesses, including companies that host web-based servers. The life cycle and ability of the UPS to keep businesses running and from realizing sizable losses during blackouts will be degraded if not protected from surges. Many UPS systems incorporate SPD components within, but they still require robust surge protection. Companies invest heavily in the ability these products offer to continue business operations without interruption.

Conclusion:

As documented in the survey results, the surge environment can produce a variety of damaging effects. Voltage surge damage can be experienced in a single event or as the result of an accumulation of surges. For example, in the case of an incandescent lamp, the damage can be immediate or from repeated surges.

The proper application of Listed and Labeled SPDs, for the specific application, can prevent damage to common electrical or electronic products in residential, commercial, and industrial applications. Voltage surges significant enough to cause equipment damage will occur with monthly or greater frequency in 69% of healthcare facilities, 76% of industrial facilities, and 80% of IT centers.

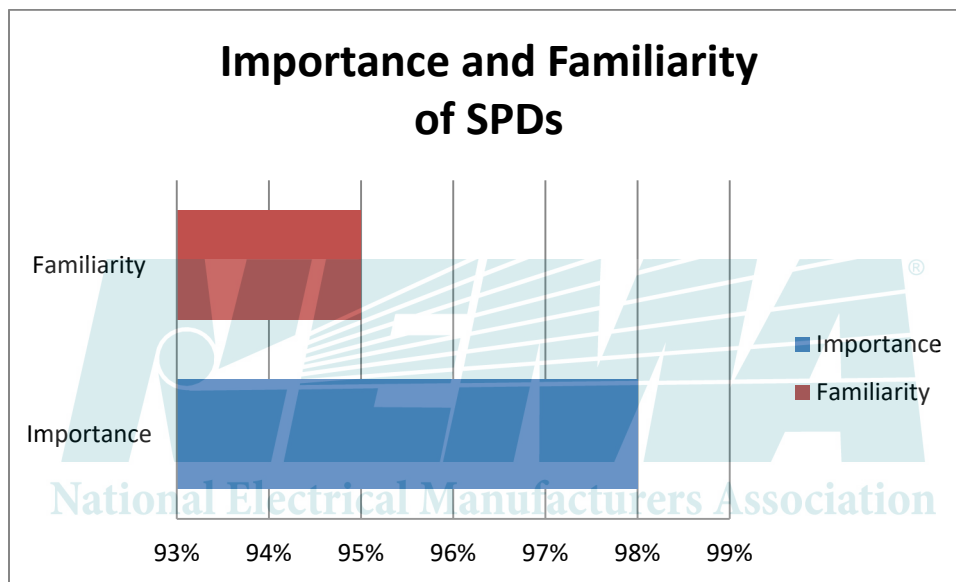
SPDs are more than an accessory. They are a necessary part of all electrical distribution systems. In commercial buildings, they can be part of the protection system for emergency lighting, computer systems, lighting, data centers, and electronic equipment. In industrial applications, they can protect machinery, control systems, and vital telecommunication links. In residential spaces, SPDs can protect home offices and entertainment equipment. Additional trends in residential spaces include the use of hard-wired devices in combination with plug-in SPDs to protect the electrical system of the whole house and appliances. The current version of the National Electric Code (NEC) requires the use of SPDs on:

- a. All emergency switchboards and panelboards;

- b. Elevators, escalators, moving walks, chairlifts;
- c. Modular data centers;
- d. Wind electric systems;
- e. Industrial machinery; and
- f. Fire pump controllers.

Revisions are underway in NEC to address the recognized need for surge protection in residential dwellings to protect the sensitive electronics and systems found in most modern appliances, safety devices such as AFCIs and GFCIs, smoke alarms, etc.

98% of engineers and contractors surveyed said surge protection is either very or extremely important. Most of the building owners listed surge protection as a priority. 95% of respondents said they are either very or extremely familiar with SPDs.



Electrical equipment is subject to voltage surge damage, and these results show conclusively that everyday electrical devices are damaged by surges of the level expected in a normal electrical distribution system. The proper application of an SPD within a home or facility can help mitigate these effects and save the cost or replacement for many electrical or electronic devices. For additional information on surge protection and its applications, please visit www.NEMASurge.org.

§

5PP - 250 Volt Two-Pole GFCI Fact Sheet

New requirements for ground-fault circuit interrupter protection (GFCI) expand the protection across a range of uses and occupancies in the 2020 edition of the NEC. First introduced in the early 1970s, their continued expansion to cover areas in homes and workplaces where occupants are particularly susceptible to electric shock accidents can be directly attributed to reductions in electrocutions and electric shock accidents as published by the U.S. Consumer Product Safety Commission.

Unfortunately, many times tragedy strikes before we see improvements to the Code. Substantiation submitted for the 2020 NEC revision process included several incidents where fatalities occurred.

Access to the 2020 NEC archived revision information can be found by visiting www.nfpa.org/70, which includes the historical record of public inputs, public comments, draft language developed by the NEC Technical Committee and final version of code language. There were four fatalities submitted as substantiation to the Technical Committee that further highlighted the need to expand this safety technology for these types of appliances.

These changes, which were arrived at after significant substantiation and deliberation from numerous, diverse organizations and individuals, have a single-minded purpose of making electrical systems safe in places where we live, work and play.

GFCI Field Testing

Listed below are the results of additional field tests that were conducted and identified as issues that under the right circumstances, could have resulted in additional fatalities.

Proper grounding and bonding as required by the NEC and manufacturer's instructions is one of the key safety components of the electrical system. The majority of issues identified in these field tests revealed improper bonding connections. GFCIs installed at these locations have functioned correctly and prevented further incidents:

Stoves/Ranges

Two-pole GFCI circuit breakers were provided to existing homeowners for installation on these circuits. The trial covered several brands: KitchenAid, Frigidaire, GE, Whirlpool, Kenmore, and Maytag. The following issues were discovered in total on approximately 20% of devices.

1. Miswiring
 - a. The grounded (neutral) conductor to frame bonding jumper was not removed when the appliance was being supplied by a 4-wire cord set.
 - b. The grounded (neutral) conductor to frame bonding jumper was not installed when the appliance was being supplied by 3-wire cord set.
2. Potentially hazardous situation
 - a. One issue was found where the lower element was in the process of failing and was starting to leak current to the frame of the appliance.

Electric Clothes Dryers

Two-pole GFCI circuit breakers were provided to existing homeowners for installation on these circuits. The trial covered several brands: Whirlpool, Amana, Maytag, LG, GE, and Kenmore. The following issue was discovered in total on approximately 15% of devices.

1. Miswiring
 - a. The grounded (neutral) conductor to frame bonding jumper was not removed when supplied by a 4-wire cord set.

AC Condenser /Heat pump

Two-pole GFCI circuit breakers were provided to existing homeowners for installation on these circuits. The trial covered several brands: Rheem, Bryant, Carrier, American Standard, Trane, Comfortmaker, Lennox, IPC, Unitary Products, Heil, Ruud, and Amana. The following issues were discovered on a total of approximately 13% of devices.

1. Miswiring
 - a. The grounded (neutral) conductor was improperly bonded in the appliance disconnecting means and/or junction boxes.
 - b. No equipment grounding conductor was installed or provided to bond the frame of AC condenser.
2. Potentially hazardous situation
 - a. This was created when a breakdown occurred in the branch circuit supply conductor insulation, resulting in a ground fault from the ungrounded conductor to the AC condenser frame.

Conclusion from Findings

The findings from installation of two-pole GFCI circuit breakers in existing homes found no interoperability issues but did identify a key installation issue where appliances were not properly installed on 4-wire systems per the manufacturer's instructions and the NEC. Additionally, the comments made in the marketplace about wiring issues that created the fatality leading to NFPA adoption of two-pole GFCI requirements on outdoor outlets were not common is incorrect. Where issues with GFCI's tripping were found, it was the grounding and wiring issues that caused them, not an issue between the outdoor AC unit and the GFCI.

GFCI protection is fully compatible with ranges, stoves, electrical clothes dryers, AC condensers, and heat pumps where installed in accordance with the manufacturer's installation instructions and the National Electrical Code. GFCI protection will properly function to de-energize the branch circuit when the appliance is improperly wired or when the appliance has a defective component.

GFCI devices have a nearly 50-year record of protection against shock and electrocution since first becoming a requirement for receptacle outlets near swimming pools in the 1971 National Electrical Code. Subsequent editions of the National Electrical Code have since

expanded GFCI protection to other areas and appliances of a dwelling where shock and electrocution hazards may exist.

The purpose of the National Electrical Code is the practice safeguarding of persons and property from hazards arising from the use of electricity. GFCI protection of the branch circuits and outlets as required in the 2020 National Electrical are essential to upholding this commitment to electrical safety.

NEMA BI 50012-2023

A NEMA Ground Fault Personnel Protection Section White Paper—Ground Fault Circuit Interrupter (GFCI) Guidance



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The National Electrical Manufacturers Association (NEMA) has developed this white paper to offer detailed technical guidance and other information related to application and installation of GFCI protection in accordance with the NFPA 70®, *National Electrical Code*® (*NEC*®).

GFCIs have a long history of saving lives. The *NEC*® introduced the use of GFCIs as a requirement in bathrooms in 1975[1], and over the years, these requirements have expanded. With the publication of the 2023 *NEC*®, GFCI protection is now required in 12 locations throughout the home[2]. The Electrical Safety Foundation (ESFI) asked the question, “What if GFCIs did not exist?” to investigate the number of electrocutions that would have likely occurred without the expansion of GFCI requirements throughout the years[3]. The ESFI found that GFCIs have contributed to an 80% drop in electrocutions, with a 93% drop in consumer product electrocutions (between 1975 and 2020)[3]. Without this expanding protection of GFCIs, there would have been an estimated 603% increase in electrocutions, with an estimated 1,118% increase in consumer product electrocutions[3]. The U.S. Energy Information Administration has stated that U.S. energy usage increased 114% between 1978 and 2020[3], highlighting the increased potential of in-home contact with water and electricity. This historic data highlights the need for *NEC*® expansion of GFCI usage throughout the home, and how this expansion has saved lives.

In recent years, states have petitioned to remove GFCI protection on dryer and range receptacles. The 2020 *NEC*® introduced this protection in response to multiple children being electrocuted by these appliances. The removal of GFCI protection from dryers and ranges will place home occupants at risk of shock and electrocution. When states do not completely adopt the updated *NEC*® in a timely fashion, they risk the safety of their residents by not requiring this protection everywhere it is needed. Amendments removing this technology could lead to a rise in consumer injuries and death.

Many states and local jurisdictions adopt and enforce GFCI protection requirements of the *NEC*® as published, with no amendments. In some cases, a state or local jurisdiction adopts additional GFCI protection requirements for a specific application or condition of use to improve and enhance the prevention of shock and electrocution beyond the minimum protection requirements in the published code. These states and local jurisdictions clearly recognize the safety benefits that GFCI protection provides to a premises wiring system.

When GFCI protection was first introduced, there were ~600 deaths per year due to consumer product electrocution[4]. This number has decreased, and in 2020 there were reports of 40. This decrease in loss of life can be attributed to a number of improvements in home wiring, including the use of better insulation on conductors, a dedicated grounding wire, and decreasing the use of knob-and-tube wiring. But one of the biggest contributors to saving lives is the use of GFCIs throughout the home.

To determine the number of electrocutions each year, NEMA looked to the Consumer Product Safety Commission's (CPSC) Underlying Cause of Death database [11]. This database contains mortality and population counts for all U.S. counties; each death certificate has a single underlying cause of death identified, and demographic data also is provided. The CPSC also published a report detailing electrocutions associated with consumer products between 2004 and 2013 [9]. The report found that the category responsible for the most electrocutions over the four-year period was “Large Appliances” (31 electrocutions), followed by “Small Appliances” (21 electrocutions). The report also found that, when compared to studies from previous years, a larger number of electrocutions happened while consumers were doing repair work [9].

NEMA sought to compare all of this data to better understand the number of homes that have GFCI protection. To estimate the number of homes protected by GFCIs on a yearly basis, NEMA reviewed data from the census.gov website and the ESFI. Plotting the data from all of these sources shows an increasingly negative correlation between GFCI protection and consumer product electrocutions:

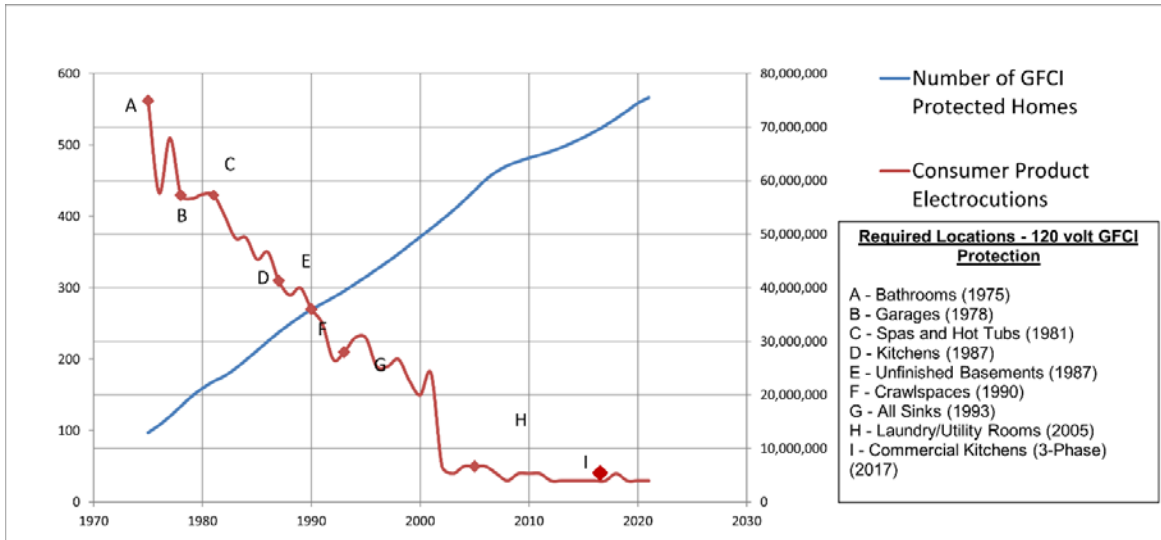


Figure 1—Number of Electrocutions, Due to Consumer Products, Per Year Compared to Number of Homes with GFCI Protection

Each of the lettered points in Figure 1 indicates when that residential location was added to the *NEC*[®] as requiring GFCI protection. The following timeline notes milestones concerning Code additions and changes concerning major appliances:

- **1987:** Kitchens were added[5], but the Code at that time only covered 120V circuits and included a note stating, "The intent of this section is to permit the exemption of receptacles which are located specifically for appliances such as refrigerators and freezers from ground-fault circuit-interrupter protection for personnel."
- **2005:** Washing machines in laundry rooms within 6 feet of a receptacle were added [12].
- **2008:** Stand-alone refrigerators and freezers in garages and unfinished basements were added[6].
- **2014:** The 6-foot provision for receptacles in laundry rooms was removed, thus requiring all washing machines in laundry rooms to require GFCI protection [7].
- **2020:** The Code was changed to cover any 240V circuits within a home[8].
- **2023:** All kitchen appliances, including refrigerators, were added to the Code [2].

With the 2020 change, electric ranges (regardless of their proximity to a sink) and electric dryers were required to be GFCI-protected. An additional change occurred in 2023, when a part of the list of specific appliances that require GFCI protection at the connection to the branch circuit, hard-wired and receptacle-connected, was relocated from Section 422.5(A) to Section 210.8(D)[2], and electric ranges were added to the 210.8(D) list. Today, due to these changes, all large appliances in a home now require GFCI protection.

Each time the *NEC*[®] adds an additional required GFCI-protected branch circuit or receptacle outlet, this protection reduces the number of electrocutions even further. The United States Census Bureau annually publishes the number of 1–2 family homes and multi-family units built within the U.S. [14]. According to this data, more than 45 million dwelling units have been built since 1987, constructed in states where many cord/plug appliances are protected by GFCIs. To determine how many of these new homes have specific appliances, we looked at a 2023 Statista report [10]. It showed that:

- 53% had dishwashers;
- 81% had refrigerators;
- 82% had microwaves;
- 71% had vacuums;
- 43% had electric ranges;

- 70% had washing machines.

While the percentage of appliances may change from year to year, this provides the reader with a statistical idea of the large number of appliances connected to GFCI-protected branch circuits. Bringing together the data from the NAHB, Statista, and State Adoption of GFCI data, 75 million appliances have become connected to GFCI-protected branch circuits since 2014. Interpolating this data backwards, since the first kitchen counter receptacle outlet requirement in 1987, an estimated 150 million appliances have become protected by GFCI technology.

GFCI tripping can manifest itself for many reasons, including wiring problems, an overloaded circuit, or lack of compatibility with a connected load. Reports have revealed that tripping incidents are split between overload/short circuit and ground fault, with a large majority being overload/short circuit, per NEMA manufacturers. In reviewing this research data and comparing it to the number of appliances reported to trip GFCIs, it is found that claims and statements related to compatibility are not substantiated. Of the more than 80 million GFCI-protected homes, NEMA only received 10 reports of GFCI tripping through the NEMA GFCI tripping website^[13] during 2023.

It would be fair to question why the actual documentation of reported GFCI tripping concerns does not match with what is claimed by certain industry groups. One of the reasons why GFCI technology performs well is the partnership between electrical manufacturers and their customers. Together, these two groups can identify practical applications that facilitate GFCI interoperability tests. This is done with a variety of appliances and appliance combinations. Some of this testing is done at home appliance labs, which can emulate more than 130,000 test cases covering more than 400 appliance brands and 150 product types, per NEMA manufacturers. Additional testing is also conducted for more than 40,000 combination loads, such as various countertop appliances, vacuum cleaners, power tools, and durable medical equipment. The lab tests alter variables such as loading, temperature, and humidity to test as many situations as possible to determine whether a GFCI will trip. The results of these extensive tests help to create GFCIs that function properly with a range of appliances.

Daily life is becoming increasingly inundated with electrification, and rightfully so. This has contributed to higher energy efficiency and has helped society reach emissions-reduction goals. People are using electricity more than ever. There is no doubt that the large increase in electricity use raises the exposure to these electrical devices, and subsequently increases the chances of electric-shock events. The GFCI steps in as a proven lifesaving device.

GFCIs serve an important, essential safety function for people using wiring systems and components. There are no reported incidents of a person being electrocuted on a branch circuit, outlet, appliance, or any other component of a premises wiring system where GFCI protection was provided. Every incident of shock or electrocution reported can be associated with circuits, equipment, and systems where GFCI protection was not installed. One could conclude that most, if not all, incidents of shock or electrocution associated with a premises wiring system could have been avoided had GFCI protection been provided.

As the evidence shows, GFCIs protect people and should be considered an essential technology.

References

- [1] NFPA 70, *National Electric Code*. National Fire Protection Association, 1975.
- [2] NFPA 70, *National Electric Code*. National Fire Protection Association, 2023.
- [3] Electrical Safety Foundation International, <https://www.esfi.org/ground-fault-circuit-interrupters-what-if-gfcis-did-not-exist/>
- [4] Garret, Robert and Ph.D. Susan B. Kyle. "An Evaluation of the U.S. Consumer Product Safety Commission's Electrocution Reduction Program," 2002, <https://www.cpsc.gov/s3fs-public/electropt1.pdf>
- [5] NFPA 70, *National Electric Code*, National Fire Protection Association, 1987.
- [6] NFPA 70, *National Electric Code*, National Fire Protection Association, 2008.
- [7] NFPA 70, *National Electric Code*, National Fire Protection Association, 2014.
- [8] NFPA 70, *National Electric Code*, National Fire Protection Association, 2020.
- [9] Hanway, Stephen and Saad Siddiqui. "Electrocutions Associated with Consumer Product: 2004-2013". https://www.cpsc.gov/s3fs-public/Electrocution-Report-2004-to-2013.pdf?V_9Zl10pv4Wz03uBPRx78lctKRABj
- [10] Kunst, Alexander. "Household appliances ownership in the U.S. in 2023," Statista 2023
- [11] U.S. Department of Health and Human Services, <https://wonder.cdc.gov/controller/datarequest?stage=search&action=current>
- [12] NFPA 70, *National Electric Code*, National Fire Protection Association, 2005.
- [13] National Electrical Manufacturers Association, "GFCI Tripping Reporting". <https://www.nema.org/membership/products/gfci-unwanted-tripping-report>
- [14] United States Census Bureau, <https://www.census.gov/data/tables/time-series/demo/pepest/2020s-total-housing-units.html>

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Arc-Fault Circuit Interrupters and Home Appliances



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Introduction

Arc-fault circuit interrupters (AFCI) were introduced into the *National Electrical Code*[®] (NEC) in 1999 for single-phase 15A and 20A branch circuits serving bedroom branch circuit outlet receptacles to provide protection from arcing faults that can cause fires. The introduction of this technology was driven by the Consumer Product Safety Commission (CPSC) and the Electronic Industries Association (EIA) in response to concerns that the conventional circuit breaker was not providing protection of branch circuit arcing, resulting in home electrical fires and deaths, injuries, and property loss.

AFCIs undergo rigorous testing, and in addition to the product standards (circuit breaker) to which each device is listed, they are also listed to UL 1699 *Arc-Fault Circuit-Interrupters*. The NEC, which is adopted in all 50 states throughout the U.S., is updated on a three-year revision cycle through a consensus-based development process. Subsequent NEC editions since the 1999 NEC have increased the number of locations where AFCIs are required. It was the 2014 edition of the NEC that added kitchens and laundries, where many cord and plug connected appliances are used on 120V single-phase 15A and 20A circuits.

This paper discusses the 15A and 20A AFCI protection of branch circuits that are utilized by cord and plug connected appliances and will provide perspective on the breadth of appliances currently protected by AFCIs. This will include a review of the number and types of appliances that are being protected along with how that data is determined. A review of the testing procedures and types of appliances tested will also be detailed in this document along with the number of test cases. Finally, a 2022 electrical contractor survey conducted by the Electrical Safety Foundation International (ESFI) on AFCI- and GFCI-protected circuits in the Commonwealth of Massachusetts will be presented [1]. The details of the ESFI research results will be addressed as they pertain to the topic of this paper.

Appliance Installations

The National Association of Home Builders (NAHB) publishes the number of 1- to 2-family homes and multi-family units built within the U.S. on a state-by-state basis. According to NAHB data, there were over 11 million dwelling units built since 2014. Over 9.5 million of those dwelling units were built in states where a majority of cord/plug appliances are protected by AFCIs.

Review of this data, coupled with the percentage of various appliances per home as found via a Statista November 2022 survey report [2], reveals that over 60 million appliances are protected by AFCIs. This is a very conservative number, as it does not include older homes that have been upgraded during the period of 2014 through 2022. Examples of the percentage of homes containing specific appliances are dishwashers (56%), refrigerators (83%), microwaves (84%), vacuums (76%), and washing machines (74%).

Unwanted Tripping

Unwanted tripping can manifest itself for many reasons that could include identification of wiring problems or lack of compatibility with a connected load. The American Circuit Breaker Manufacturers Association (ACBMA) reports [3] that received calls on AFCIs tripping is at 0.0078% of AFCIs shipped. These reports collect data that includes questions on selection, wiring, application, and tripping. Reports have revealed that tripping incidents are split between overload/short circuit and arc fault, with a large majority being overload/short circuit. In reviewing this research data and comparing this data to the number of appliances that are reported to trip AFCIs, it is found that claims and statements made related to compatibility being the vast majority of AFCI unwanted tripping incidents are not substantiated.

NEMA received 35 reports of unwanted tripping through the [AFCIsafety.org](https://www.afcisafety.org) website in 2021 through 2022, and none of the reported unwanted tripping issues identified a faulty circuit breaker or an incompatible product issue. There are, however, 10 submissions where the customer has not responded to the investigation. It would be fair to question why the actual documentation of reported AFCI tripping concerns does not match that which is claimed by certain industry groups.

One of the reasons AFCI technology has performed and continues to perform well is because of the partnerships between AFCI manufacturers and their customers, who together are able to identify applications and practical application examples that facilitate AFCI manufacturer interoperability tests with a variety of appliances and appliance combinations. These home appliance lab emulations conduct over 130,000 test cases covering over 400 appliance brands and 150 product types. There is also an additional testing done for over 40,000 combination loads such as various countertop appliances, vacuum cleaners, power tools, and durable medical equipment. The lab tests use loading, temperature, humidity, and other factors to change the parameters to provide as many options as possible to determine if an AFCI will trip when protecting the circuit where an appliance or group of appliances is installed. The results of these extensive tests are AFCIs that function properly with appliances.



Figure 1 Courtesy of Schneider Electric

Figure 2 Courtesy of Schneider Electric

ESFI Electrical Contractor Survey

The Electrical Safety Foundation International (ESFI) conducted a survey of electrical contractors asking about how AFCI and GFCI devices performed in homes in Massachusetts. The Commonwealth of Massachusetts has had a requirement for all 120VAC 15A-20A receptacles to be protected by AFCIs since January 1, 2020. The respondents stated that they make an average of 27 total service calls per week. The contractors concluded that 59% of these calls were related to tripped circuit breakers or fuses. In reviewing the responses on circuit breaker calls, the breakdown of results includes the following:

- 68% of the service calls were related to overload/short circuit trips
- 18% of the service calls were AFCI trips
- 10% of the service calls were GFCI trips
- 4% of the service calls were defective products

Further investigation of the results of the service calls found that the most common mistakes identified by electrical contractors included the following:

- 37% were wiring issues
- 32% were related to the lack of or inadequate GFCI protection
- 27% overloaded circuits
- 2% other causes

There were no documented issues related to AFCIs from what was found on these service calls. ESFI also attempted to survey homeowners who live in homes built since January 1, 2020, but did not receive statistically significant results. The initial findings showed that AFCI devices work as designed to detect faults in appliances and wiring, but more research is required.

Summary

In conclusion, data shows that AFCIs are protecting over 60 million appliances with a very small number of documented reports of unwanted tripping. The claims around high amounts and percentages of

unwanted tripping have been anecdotal; lack details on when, where, and why occurrences are happening; and do not constitute facts around AFCI and appliance compatibility performance. These are clearly unsubstantiated statements in light of the data provided in this document.

The amount of testing done to verify that AFCIs will work with various appliances is extensive and goes far beyond what the product safety standard requires to make sure homeowners receive the best protection from fires with the installation of AFCIs. In addition, the ESFI survey shows that most tripping reports and issues are overloads and short circuits. The absence of any AFCI reported unwanted tripping issues from a state that requires them to protect most, if not all, of the receptacles found in the house provides further data that AFCIs are functioning properly. This data provides specific information on the successful safety protection of branch circuits by AFCIs when loads are appliances or other devices.

References

[1] *ESFI Arc-Fault Circuit Interrupter (AFCI) and Ground Fault Circuit Interrupter (GFCI) Performance Survey*, ESFI, 2022

[2] *Household appliances ownership in the U.S. in 2022*, Alexander Kunst, Statista, 2022

[3] *NEC® CMP-2 ACBMA Presentation*, American Circuit Breaker Manufacturing Association (ACBMA), October 2018



Opponent Testimony



July 11, 2024

South Dakota Electrical Commission
Department of Labor
217 West Missouri Avenue
Pierre, South Dakota 57501

Re: Proposed Amendment to ARSD 20:44:14:01(12)

Dear Commissioners:

On behalf of the South Dakota Home Builders Association (SDHBA) and its affiliated local chapters, we are writing in opposition to proposed amendments to ARSD 20:44:14:01(12).

SDHBA and its affiliated local chapters represent over 1,800 companies throughout South Dakota engaged in business of constructing and remodeling homes, including companies that provide materials and services for these projects. Our members and their customers are directly affected by changes in local building codes. They feel the impact of new regulations on the cost of housing and deal with consequences of ill-conceived regulations.

We recognize that building codes play an important role in protecting public health and safety, and we support reasonable, cost-effective regulations to achieve these outcomes. Model building codes such as the National Electrical Code (NEC) are useful guidelines for developing local regulations, but they should not simply be adopted verbatim and without careful consideration of the relative costs and benefits.

Based on these principles, we respectfully urge the Commission to retain the following local exceptions to the 2020 NEC, which are codified in subsections (a) through (f) of ARSD 20:44:14:01(12):

- *GFCIs for Outdoor Outlets.* Exception to requirement in Section 210.8(F) for outdoor outlets up to 150 volts and 50 amperes to have GFCI protection.
- *Surge Protection.* Exception to requirement in Section 230.67 for all services supplying dwelling units to be provided with a surge-protection device.
- *GFCIs for 250 Receptacles.* Exception to requirement in Section 210.8(A) for receptacles serving 240-volt appliances to have GFCI (ground fault circuit interceptor) protection when located in bathrooms, crawl spaces, basements, laundry areas, or within 6 feet of sinks, bathtubs, or showers.
- *Receptacles near Bathtub and Shower Spaces.* Exception to provision in Section 406.9(C) prohibiting the installation of any receptacle within 3 feet of a bathtub or shower stall unless the bathroom is not large enough to accommodate the required distance.

Initially, the Commission adopted the 2020 NEC without these exceptions. After the Legislature's Rules Review Committee remanded the rules to the Commission based on concerns raised by SDHBA and other interested parties, the Commission held another hearing and adopted the 2020 NEC with the four exceptions. Now the Commission is proposing to adopt the 2023 NEC without the exceptions to Section 230.67, 210.8(A), and 406.9(c).

These local exceptions made sense then, and they make sense now. The Commission has not explained why the exceptions are no longer appropriate. What circumstances have changed in the past three years? According to the attached analysis from the National Association of Home Builders (Exhibit A), eliminating these exceptions will materially increase the cost of housing without providing significant improvements in safety and functionality.

We also urge the Commission to exempt the following appliances from the GFCI-protection requirement in Section 210.8(D) of the 2023 NEC, regardless of where the appliance is located:

- Electric ranges
- Wall-mounted ovens
- Counter-mounted cooking units
- Clothes dryers
- Microwave ovens

As the analysis from the National Home Builders Association shows, GFCI devices are not always compatible with modern 250-volt appliances and can cause nuisance tripping. Nuisance tripping is not just an inconvenience. It also poses a health and safety risks. When nuisance tripping occurs, frustrated homeowners often blame the contractor who installed the device and demand that it be removed. This defeats the purpose of the regulatory requirement and increases costs.

By adopting the 2023 NEC with these local exceptions, the Commission can promote public safety without subjecting homeowners to unnecessary costs and the inconvenience of electrical devices that do not operate as intended.

Thank you for your consideration.

Sincerely,



Tony Kneeland
Tony Kneeland
President



Joe Ludwig
Joe Ludwig
President



Zach Shull
Zach Shull
President



Tony Brower
Tony Brower
President



Joel Ingle
Joel Ingle
President



Nick Osterkamp
Nick Osterkamp
President



Ryan Chartier
Ryan Chartier
President



Neil Jensen
Neil Jensen
President

EXHIBIT A



GFCIs for 250-Volt Receptacles – 210.8(A) & 210.8(D)

This amendment removes the requirement for receptacles serving 250-volt appliances to have GFCI protection when located in bathrooms, crawl spaces, basements, laundry areas, or within 6 feet of sinks, bathtubs, or showers. Before the 2020 NEC, this section only applied to receptacles up to 125 volts. This amendment also removes the requirement for GFCI coverage of specific 250-volt appliances, which was added to the 2023 NEC.

South Dakota Cost Implication:

The cost of requiring GFCIs on 250-volt receptacles in South Dakota was calculated to be between \$150 to \$210 for homes with two 250-volt appliances, such as an electric range and an electric dryer. Many homes also have additional appliances that would be affected, such as electric water heaters. Electronic device costs have recently significantly increased due to global supply chain challenges.

Revise as follows:

210.8(A) Dwelling Units.

All 125-volt, single-phase, 15- and 20-ampere ~~through 250-volt~~ receptacles installed in the locations and supplied by single-phase branch circuits rated 150 volts or less to ground shall have ground-fault circuit-interrupter protection for personnel.

- (1) Bathrooms
- (2) Garages and also accessory buildings that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use
- (3) Outdoors
- (4) Crawl spaces — at or below grade level
- (5) Basements
- (6) Kitchens
- (7) Sinks — where receptacles are installed within 1.8 m (6 ft) from the top inside edge of the bowl of the sink
- (8) Boathouses
- (9) Bathtubs or shower stalls — where receptacles are installed within 1.8 m (6 ft) of the outside edge of the bathtub or shower stall
- (10) Laundry areas
- (11) Indoor damp and wet locations

[The exceptions remain unchanged.]

210.8(D) Specific Appliances.

GFCI protection shall be provided for the branch circuit or outlet supplying the following appliances rated 150 volts or less to ground and 60 amperes or less, single- or 3-phase:

- (1) Automotive vacuum machines
- (2) Drinking water coolers and bottle fill stations
- (3) High-pressure spray washing machines
- (4) Tire inflation machines
- (5) Vending machines
- (6) Sump pumps
- (7) Dishwashers
- ~~(8) Electric ranges~~
- ~~(9) Wall mounted ovens~~
- ~~(10) Counter mounted cooking units~~
- ~~(11) Clothes dryers~~
- (12) Microwave ovens

Reason:

The two main reasons for this amendment are the (1) incompatibility issues caused by requiring 250-volt appliances to be on a GFCI device and (2) the inadequate substantiation given when it was adopted into the National Electrical Code.

The change to this section in the model code now requires receptacles serving household ranges to be covered by a GFCI device. The Association of Home Appliance Manufacturers (AHAM) points out that when this code proposal was submitted to the NEC, it was not submitted to the relevant product safety standards for household appliances that connect to such outlets. As a result, no evaluation was conducted to evaluate issues of compatibility between these household appliances and GFCI devices, leading to nuisance tripping.

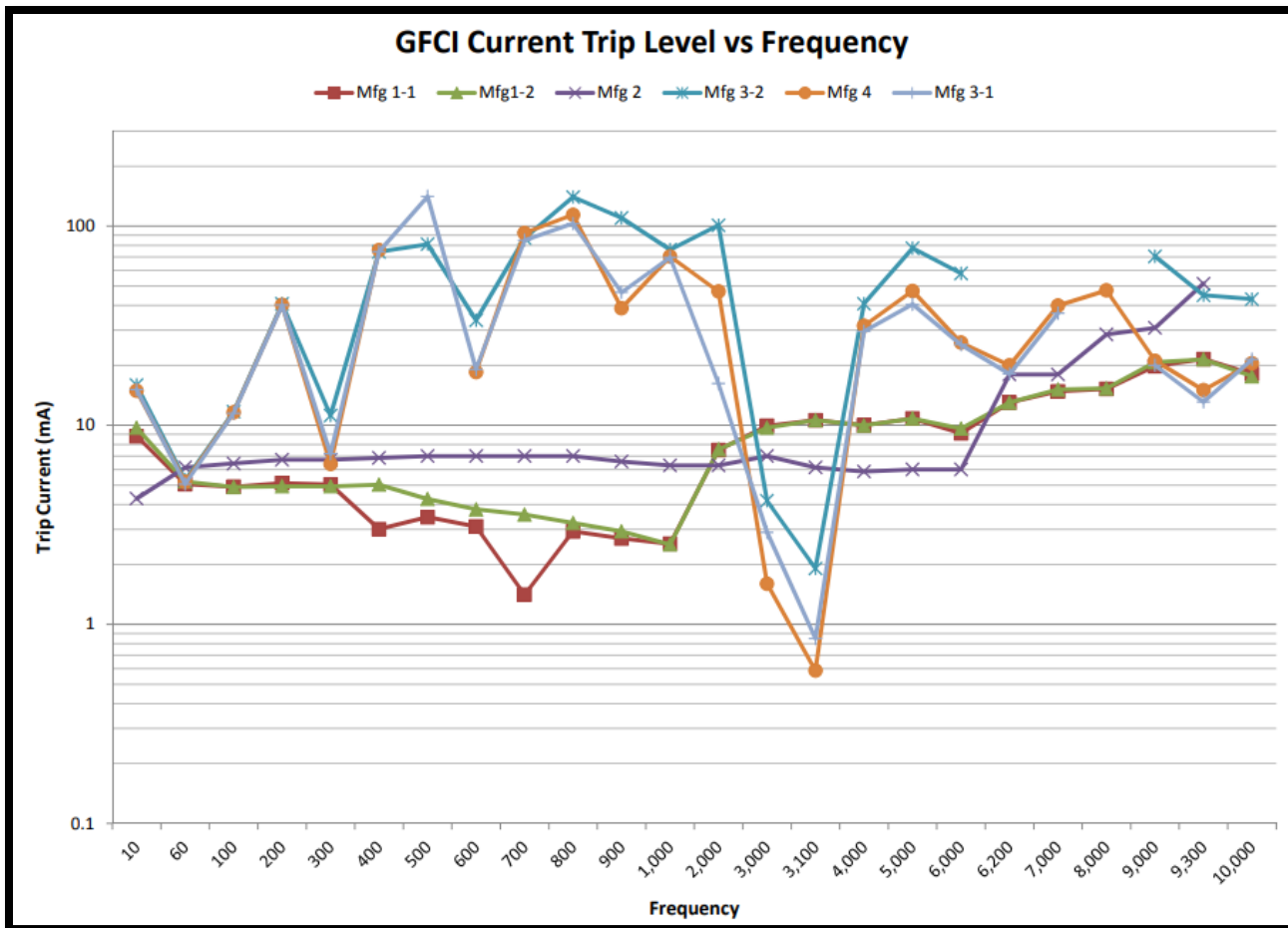
GFCIs trip on safe appliances

There is a technological incompatibility between common loads in the home and GFCIs. The incompatibility is often realized in the form of “nuisance tripping”, where a GFCI trips and no electrical hazard is present. This incompatibility is especially pertinent in the context of home appliances, which are subject to continuously updated, mandatory, Department of Energy efficiency requirements. In order for appliances to meet efficiency standards, home appliance manufacturers incorporate components that operate at frequencies higher than the mains frequency of 60-Hertz. These technologies include switch-mode power supplies, electronically commutated motors, and LED drivers. More information on technology options to meet efficiency requirements can be found here:

- [Conventional cooking appliances \(https://bit.ly/3Ph5S6R\)](https://bit.ly/3Ph5S6R)
- [Microwaves \(https://bit.ly/3ZfRiRi\)](https://bit.ly/3ZfRiRi)

It should be noted that technologies used to make these appliances more efficient are similar to technologies used to make central air conditioners more efficient.

Presently, there are significant inconsistencies in GFCI performance above 60-Hertz. The graph below depicts test data showing this variation amongst 6 different GFCIs:



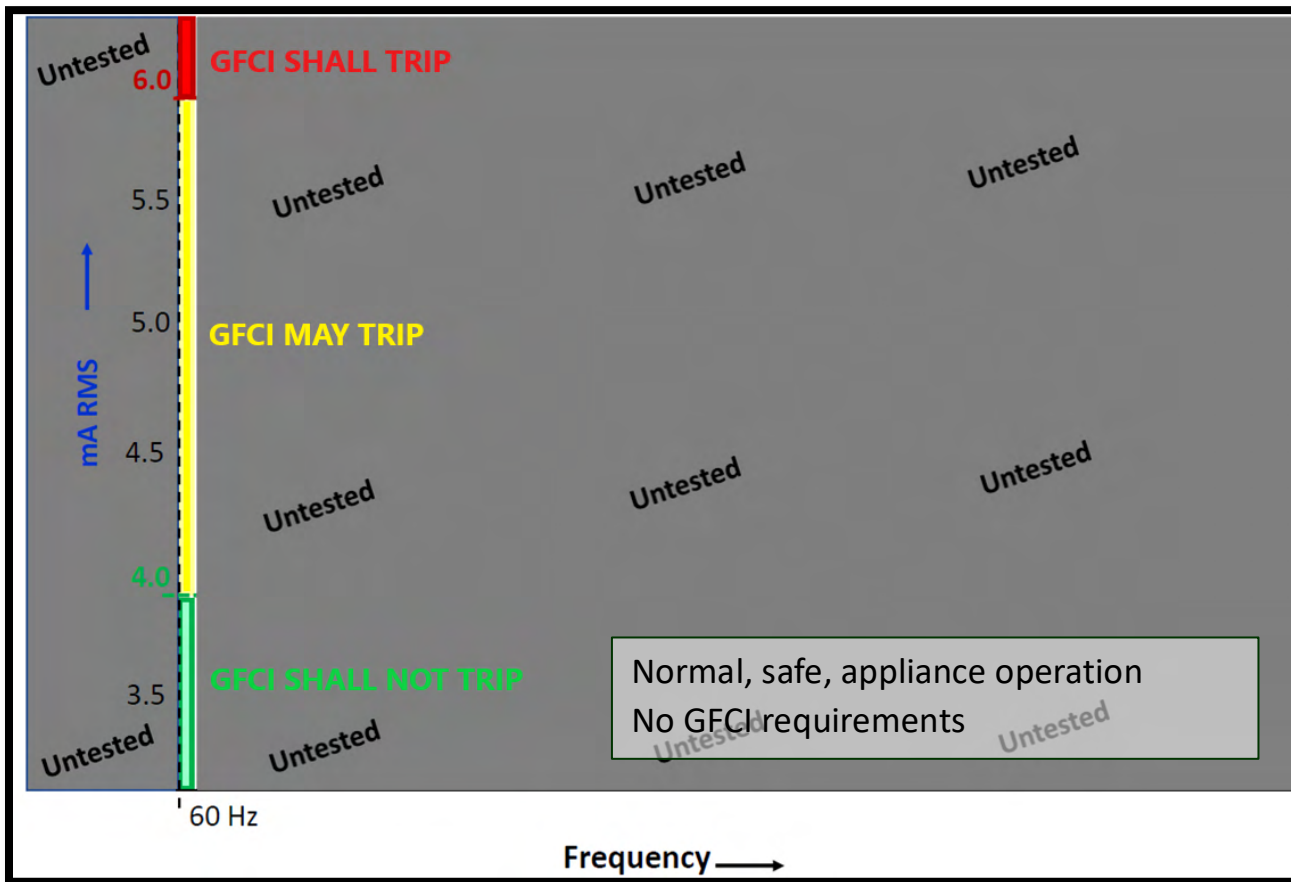
To study effects of this variation, UL has conducted an independent study testing 3 different types of appliances, from 3 different manufacturers, connecting each of these appliances to 10 different GFCIs. All three appliances contain high frequency components - such components are found in virtually all modern home appliances. A link to the study is here: [Study of High Frequency Spectrum \(https://bit.ly/45Nd3KP\)](https://bit.ly/45Nd3KP)

There are a few notable items from the UL study:

1. GFCI trip thresholds are all over the place. At certain frequencies, GFCI trip thresholds differ by roughly 150%.
2. The appliances are safe. When compared to present leakage current requirements and possible future requirements, all appliances pass by a wide margin.
3. The three appliance models tested are representative of many more models that are essentially identical as defined by Department of Energy.
4. GFCIs trip on all the appliances tested.

The root cause of incompatibility lies in differences of allowed leakage current in appliance standards and tripping requirements in the GFCI standard.

PRESENT REQUIREMENTS FOR GFCI TRIPPING



Appliances are operating in the gray space shown, where there are no requirements for when a GFCI shall or shall not trip. It is up to each GFCI manufacturer to set their own high frequency tripping levels which may not be based on safety.

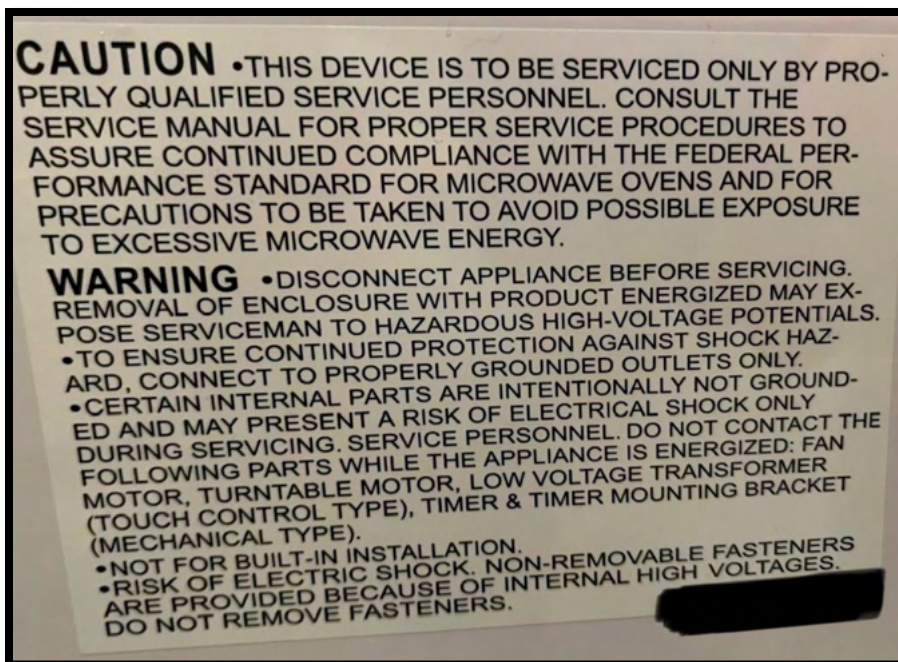
New home appliance requirements have already taken formal steps toward publication with an updated high frequency test achieving consensus in the Technical Committee covering UL 101. It will take time to update all the relevant standards and will take even longer to develop and ship the updated product. Until all of these updates have been made, nuisance tripping will continue to occur, and put people in danger, if no action is taken in the National Electrical Code.

Electric ranges, rated more than 120 volts, may be operating above the existing 60-hertz GFCI trip thresholds. Home appliance manufacturers have already updated the UL 858 standard to correct this, with updates becoming mandatory in 2025. Furthermore, AHAM will be pursuing similar updates to component standards such as UL 1030 (*Safety Standard for Sheathed Heating Elements*).

The safety risks of nuisance tripping need to be considered

If GFCI protection continues to be required, as laid out in the 2023 NEC, while the incompatibility issue remains, there is a high risk of people being adversely impacted by disabled appliances due to nuisance tripping. This risk may be higher than the risk of people being exposed to a leakage current that could cause harm.

Incidents involving electrocutions were provided from the Consumer Products Safety Commission. However, these were given more weight than necessary since it is unclear whether a GFCI would have prevented these incidents. In the case of microwaves, the electrocutions were repair(!) related. It is unknown if these microwaves were plugged into mains or if the shock came from high voltage internal capacitors which can remain charged after unplugging the appliance. Similarly, one of the stove electrocutions involved a generator. It should also be noted that appliances are required to be marked, cautioning users from service while connected to mains:



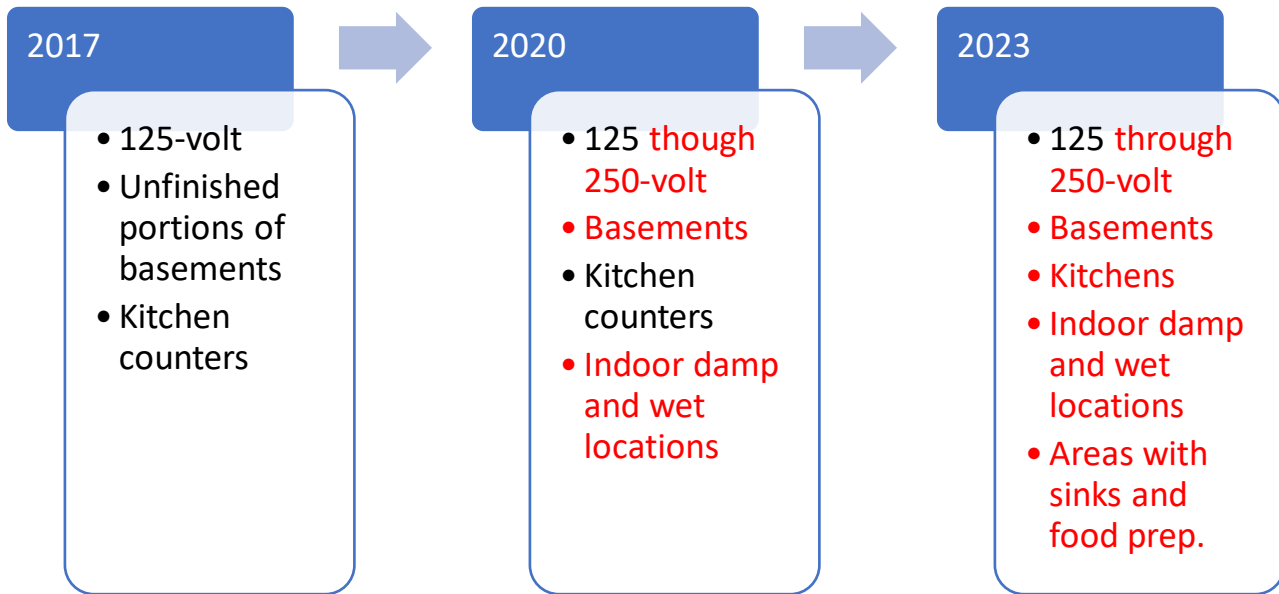
In contrast, there are numerous reports of nuisance tripping on home appliances. For example, recently, 65 home providers and contractors reported 1700+ housing units experiencing nuisance tripping in Massachusetts. The coalition's public comments can be found as an attachment at the end of this proposal. The reports cover multiple types of appliances (not just cooking), including products from multiple home appliance manufacturers and multiple GFCI manufacturers.

If a GFCI nuisance trips on a cooking product this affects one's ability to provide for a family, being most impactful to low-income communities that are not well represented in the NEC development process; such households cannot go out to eat. It should be noted that additional risks, such as burn risks from cooking large loads on a hot plate, physically impaired persons using a range due to the unavailability of a microwave, and a non-trained consumer trying to bypass a GFCI which is nuisance tripping, are not accounted for in the example calculations.

The committee contended that 250-volt receptacles presented similar hazards as 125-volt convenience receptacles and this is not true. 250-volt receptacles are installed behind the range or dryer without being readily accessible to the consumer. 250-volt appliances are plugged in and left for the operation of the appliance, but 125-volt receptacles are generally accessible to the consumer. If the consumer chooses to, they could use a convenience receptacle for extension cords or other appliance use, whereas a 250-volt receptacle is specific to that appliance.

Conclusion: GFCIs for 250-Volt Receptacles – 210.8(A) & 210.8(D)

There has been a significant expansion of GFCI requirements in recent NEC code cycles:



These new locations contain appliances which are significantly more complex than appliances in past GFCI locations such as bathrooms and kitchen countertops. While a GFCI may be suitable for protection on circuits powering hair dryers and blenders, they are not suitable for protection on more complex appliances subject to efficiency requirements. GFCIs must be modernized before they are required to be connected to more complex loads. While this modernization occurs, GFCI protection must be paused to protect consumers.

In addition to locations specified in 210.8(A), GFCI requirements for cooking appliances are also found in 210.8(D). Exceptions in both sections are needed for a pause in GFCI requirements to be effective.

Similar amendments have been adopted in Iowa, Oregon, and Utah, and the requirement for GFCI coverage on 250-volt receptacles has also been postponed in some jurisdictions.

Attached: Letter to the Department of Fire Services

GFCIs for Outdoor Outlets – 210.8(F)

This amendment removes the requirement for outdoor outlets other than those receptacles covered by 210.8(A) to have GFCI protection.

South Dakota Cost Implication:

The cost of requiring GFCIs on outdoor outlets in South Dakota was calculated to be between \$150 to \$200 per home.

Revise as follows:

~~210.8(F) Outdoor Outlets:~~

[Delete the entire section.]

Reason:

The requirements of this section have been very contentious since it was introduced in the 2020 NEC. When it was first implemented, multiple states experienced large numbers of GFCIs tripping, which shut down air conditioning and heat pump units. Due to the problems experienced by the first states to adopt the 2020 NEC with the new section, almost every other state that adopted that edition modified or deleted Section 210.8(F).

The 2023 edition would have required this section to be enforced in full except for the intervention of the NFPA Standards Council following an appeal. In their decision from August 2022, the Council, which acts like a court of last resort in the NFPA code development process, commented that the section has been at the heart of multiple processed Tentative Interim Amendments (TIAs), as well as extensive Task Group work since it was introduced. According to the Council, the appeal does present a clear and substantial basis upon which to overturn the results yielded by the NPFA standards development process. It cannot be overemphasized how significant this statement is, and it shows that not all model code changes should be accepted at face value.

The Council's final decision #22-12 adds an exemption for "listed HVAC equipment" which expires September 1, 2026. Jurisdictions should be aware of this date because it is highly unlikely the compatibility issues explained below will be resolved by then. To fully address the issue, the standards that govern GFCI protection as well as HVAC equipment need to be updated in a coordinated manner, and that process is not close to completion.

If GFCI protection is required while the incompatibility issue remains, there is a higher risk of people being adversely impacted by exposure to extreme temperatures due to nuisance tripping than the risk of people being exposed to a leakage current that could cause injury or harm. The issue of GFCI protection not being compatible with listed HVAC equipment was known at the time it was approved for the model code. In fact, three of the four negative ballots during

the code development cycle specifically mentioned the concern with incompatibility associated with requiring GFCI protection for listed HVAC equipment.

Technical Substantiation

UL 943 (*Standard for Ground-Fault Circuit-Interrupters*) requires that Class A ground-fault circuit-interrupters are capable of tripping at a minimum of 6 mA and could be as low as 4 mA. UL 60335-2 (*Standard for Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air Conditioners and Dehumidifiers*) allows a maximum leakage current value of 10 mA for appliances accessible to the general public.

Data shows that HVAC equipment can have a leakage current higher than what would trip a Class A GFCI, but the touch current remains at safe levels. What is concerning are the number of fatalities (no cooling during a heat wave period) due to nuisance trips associated with GFCI protection of HVAC equipment.

Facts to Consider		Sources
No. of Homes with HVAC Units in US (Estimated)	100 million	https://www.eia.gov/consumption/residential/reports/2009/air-conditioning.php
US Population Age 65 and over	17%	https://censusreporter.org/profiles/01000US-united-states/
Temperature Where Heat Exhaustion or Stroke Can Occur	104° F	https://www.mayoclinic.org/diseases-conditions/heat-stroke/symptoms-causes/syc-20353581

Five conditions were identified that affect interoperability which have yet to be fully examined. This highlights the fact that a solution to the issue is unlikely to be found prior to the 2026 expiration date for the current exception as approved by the Standards Council.

Conclusion

Almost every state that has adopted the 2020 Edition of the NEC has modified or deleted Section 210.8(F). The equipment incompatibility issues identified above will not be resolved by September 1, 2026. If GFCI protection is required while the incompatibility issue remains, there is a higher risk of people being adversely impacted by exposure to extreme temperatures due to nuisance tripping than the risk of people being exposed to a leakage current that could cause injury or harm.

Similar amendments have been adopted in Georgia, Massachusetts, New Mexico, Oregon, Texas, and Utah. Many other states have dealt with Section 210.8(F) in ways other than code amendments. Additionally, five states added exemptions allowing certain pumps (sump pumps, sewage lift pumps or condensate pumps) to not be covered by a GFCI.

Surge Protection – 230.67

This amendment removes the requirement for all services supplying dwelling units to be provided with a surge protective device.

South Dakota Cost Implication:

The cost of requiring surge protectors in South Dakota was calculated to be between \$125-\$130 per home.

Revise as follows:

~~230.67 Surge Protection.~~

[Delete the entire section.]

Reason:

Adequate substantiation was not provided to clearly identify a risk to equipment or safety concern to warrant this requirement being added to the 2020 NEC. Surge protection devices (SPDs) are currently permitted by the code and can provide a value to the end user, but it should remain up to the consumer as to whether the benefit is worth the investment. There are also potential issues with mandating currently available surge-protection products in all cases.

In addition to the overall problems of this provision, the 2023 NEC added the requirement that SPDs need to have a nominal discharge current rating of 10kA minimum. The National Electrical Manufacturers Association (NEMA) that represents the manufacturers of these devices submitted an amendment to remove the 10kA rating. In their testimony, they said the following: “The currently proposed revisions would confuse installers, specifiers, and inspectors who are familiar with interrupting ratings, and short circuit current ratings. It would inappropriately encourage them to require a nominal discharge current equal to or greater than the available short circuit current, under the mistaken belief that this would assure compliance with manufacturers’ installation and use instructions, as required by NEC Section 110.3(B), or with short circuit current ratings - rating requirements of relevant 2023 NEC Sections.”

Another company that manufacturers electrical devices claimed that the minimum rating of 10kA backed by certain members of the industry “represents an unwarranted exclusion of products offered by many other industry providers and stakeholders.” These products that are now excluded have ratings permitted by their listing with UL Solutions (previously Underwriters Laboratories) and, until now, were compliant with the NEC. This requirement severely limits market choice by reducing the number of manufacturers offering compliant SPDs from about a dozen to just four. This is especially concerning in this time when supply chain difficulties already make it difficult to procure electronic devices and increase their cost substantially.

There is also no guarantee that SPDs remain in service, further negating any possible advantages of this new mandate. This becomes a costly requirement without a means to determine the benefit for the user. It is not necessary to mandate the protection just in case a consumer has a transient incident.

During the code development process for the 2020 NEC, several public comments were rejected to expand the surge-protection requirement to all occupancies and multiple levels of protection because they lacked substantiation. The same reason should be applied to remove this section as well.

Similar amendments have been adopted in Maine, North Dakota, Oregon, and South Carolina.

Receptacles Near Bathtub and Shower Spaces – 406.9(C)

This amendment reinstates the allowance for GFCI-protected receptacles to be located within 3-feet of a bathtub or shower stall.

Revise as follows:

406.9(C) Bathtub and Shower Space.

Receptacles shall not be installed ~~inside of the tub or shower or within a zone measured 900 mm (3 ft) horizontally from any outside edge of the~~ within or directly over a bathtub or shower stall, ~~including the space outside the bathtub or shower stall space below the zone.~~

~~The zone also includes the space measured vertically from the floor to 2.5 m (8 ft) above the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and shall include the space directly over the bathtub or shower stall and the space below this zone, but not the space separated by a floor, wall, ceiling, room door, window, or fixed barrier.~~

~~Exception No. 1: Receptacles installed in accordance with 680.73 shall be permitted.~~

~~Exception No. 2: In bathrooms with less than the required zone, the receptacle(s) required by 210.52(D) shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.~~

~~Exception No. 3: Weight supporting ceiling receptacles (WSCR) shall be permitted to be installed for listed luminaires that employ a weight supporting attachment fitting (WSAF) in damp locations complying with 410.10(D).~~

~~Exception No. 4: In a dwelling unit, a single receptacle shall be permitted for an electronic toilet or personal hygiene device such as an electronic bidet seat. The receptacle shall be readily accessible and not located in the space between the toilet and the bathtub or shower.~~

Informational Note No. 1: See 210.8(A)(1) for GFCI requirements in a bathroom.

Informational Note No. 2: See 210.11(C) for bathroom branch circuits.

Informational Note No. 3: See 210.21(B)(1) for single receptacle on an individual branch.

Reason:

Receptacles in bathrooms are required to be GFCI protected, so further restrictions on their location are not needed. The language in the model code adds complexity, which is made clear based on the addition of multiple exceptions. And complexity leads to non-uniform enforcement.

Corded, handheld devices, such as hairdryers, hair trimmers, and shavers, have cords longer than three feet, so the new requirement does not prevent them from entering a tub or shower. Additionally, the code requires a receptacle within three feet of a sink with no minimum. No substantiation was presented when this change was adopted to suggest that a receptacle within three feet of a bathtub or shower poses a greater risk than that at a sink. Since receptacles in bathrooms are required to be GFCI protected these locations do not pose different levels of risk. Both should be acceptable.

Finally, receptacles in proximity to bathtub and shower spaces is addressed for manufactured and mobile homes in the code as well, but distance restrictions are not included. The requirements for site-built homes should not be more restrictive than for manufactured and mobile homes.

Similar amendments have been adopted in Maine, Oregon, and Utah.

Arc-Fault Circuit Interrupters (AFCI) – 210.12

This amendment removes the requirement for AFCI devices in residential kitchens and laundry areas only.

South Dakota Cost Savings:

Removing the requirement for AFCI devices in residential kitchens and laundry areas will save an average of \$450 per new single-family home in South Dakota.

Revise as follows:

210.12(B) Dwelling Units.

All 120-volt, single-phase, 10-, 15-, and 20-ampere branch circuits supplying outlets or devices installed in the following locations shall be protected by any of the means described in 210.12(A)(1) through (A)(6):

- ~~(1) — Kitchens~~
- (2) Family rooms
- (3) Dining rooms
- (4) Living rooms
- (5) Parlors
- (6) Libraries
- (7) Dens
- (8) Bedrooms
- (9) Sunrooms
- (10) Recreation rooms
- (11) Closets
- (12) Hallways
- ~~(13) — Laundry areas~~
- (14) Similar areas

Exception No. 1: AFCI protection shall not be required for an individual branch circuit supplying a fire alarm system installed in accordance with 760.41(B) or 760.121(B). The branch circuit shall be installed in a metal raceway, metal auxiliary gutter, steel-armored cable, or Type MC or Type AC cable meeting the applicable requirements of 250.118, with metal boxes, conduit bodies, and enclosures.

Exception No. 2: AFCI protection shall not be required for the individual branch circuit supplying an outlet for arc welding equipment in a dwelling unit until January 1, 2025.

Informational Note No. 1: See *NFPA 72-2022, National Fire Alarm and Signaling Code*, 29.9.4(5), for information on secondary power source requirements for smoke alarms installed in dwelling units.

Informational Note No. 2: See 760.41(B) and 760.121(B) for power source requirements for fire alarm systems.

Reason:

The current fire data coming from NFPA should give us pause. There is no empirical, real-world data we can point to supporting the expansion of AFCI requirements. Quite the opposite—we now see that the installation of tens of millions of AFCI devices has not had a noticeable effect on fire data. As millions of AFCI devices were being installed, home fires involving electrical distribution and lighting equipment experienced a dramatic increase between 2010 and 2014 (see Figure 1)—the numbers of fires jumped from 19,900 to 37,900 in that period.

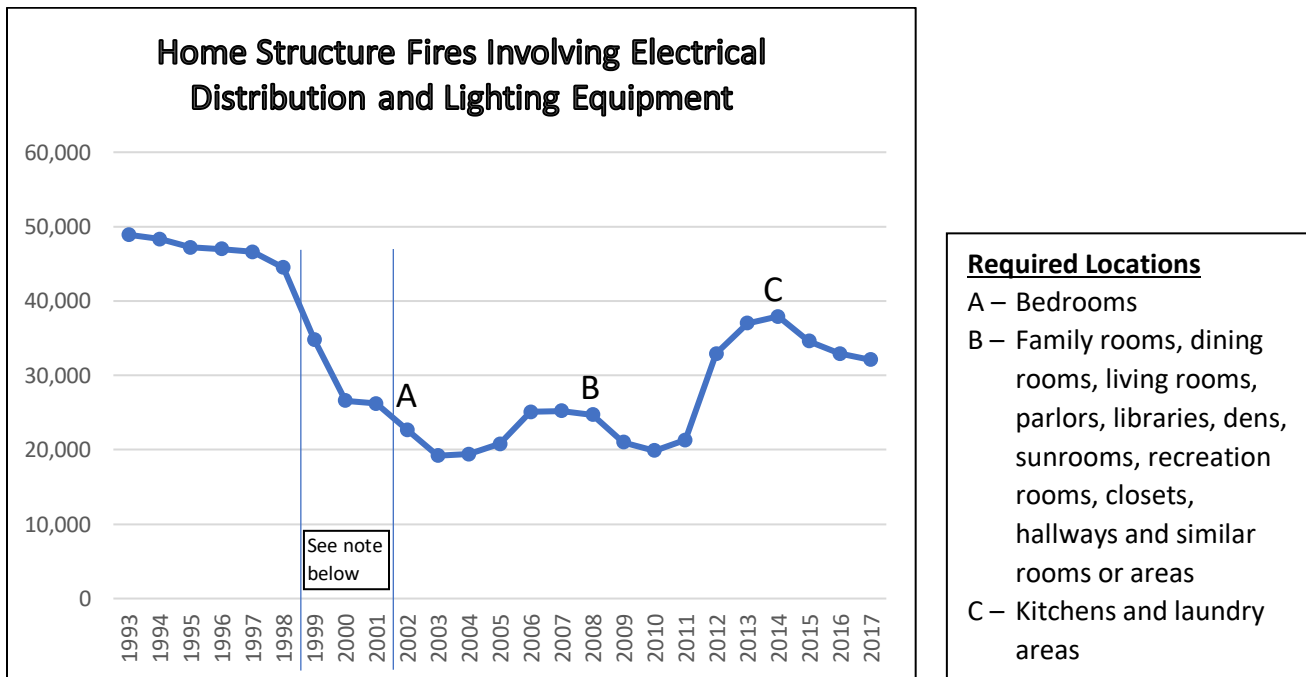


Figure 1

Source: [Home Fires Caused by Electrical Distribution and Lighting Equipment: Supporting Tables](https://bit.ly/3LlBAmK) (<https://bit.ly/3LlBAmK>), Feb. 2022, NFPA

Note: Because of low participation in NFIRS Version 5.0 during 1999-2001, data from these years is not considered reliable.

In contrast to the data surrounding AFCIs, there is a clear relationship between the early adoption of GFCIs and the reduction in electrocutions (see Figure 2). This is the effect we should be expecting from AFCIs as well, but we are not seeing anything similar to the benefit GFCIs have provided.

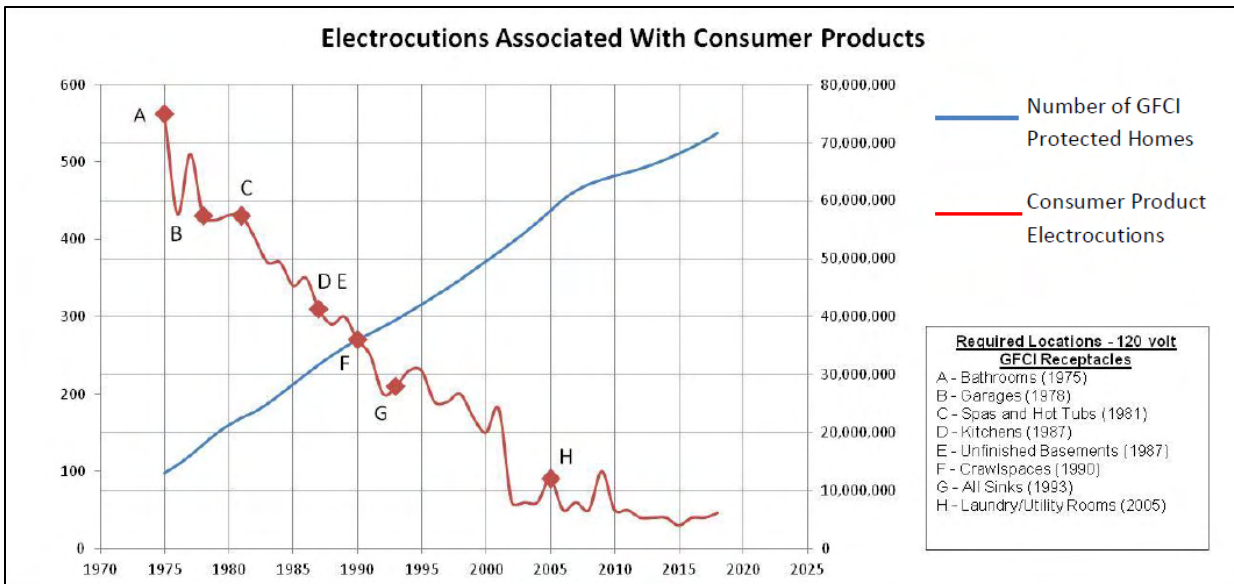


Figure 2: GFCI Protection in Homes Versus Electrocutions 1975 to 2018 (Source: A NEMA Ground Fault Personnel Protection Section Article entitled “GFCI Receptacles: Consumer Protection Personified” June 2020, Revision 2).

Another way to look at the AFCI data is to show the increase in fires as a percent of the low water mark of 2003. After 2008, when the bulk of circuits in a home were required to be covered by an AFCI device, fires incidents reached their highest number since 1998—a nearly 100% increase over 2003.

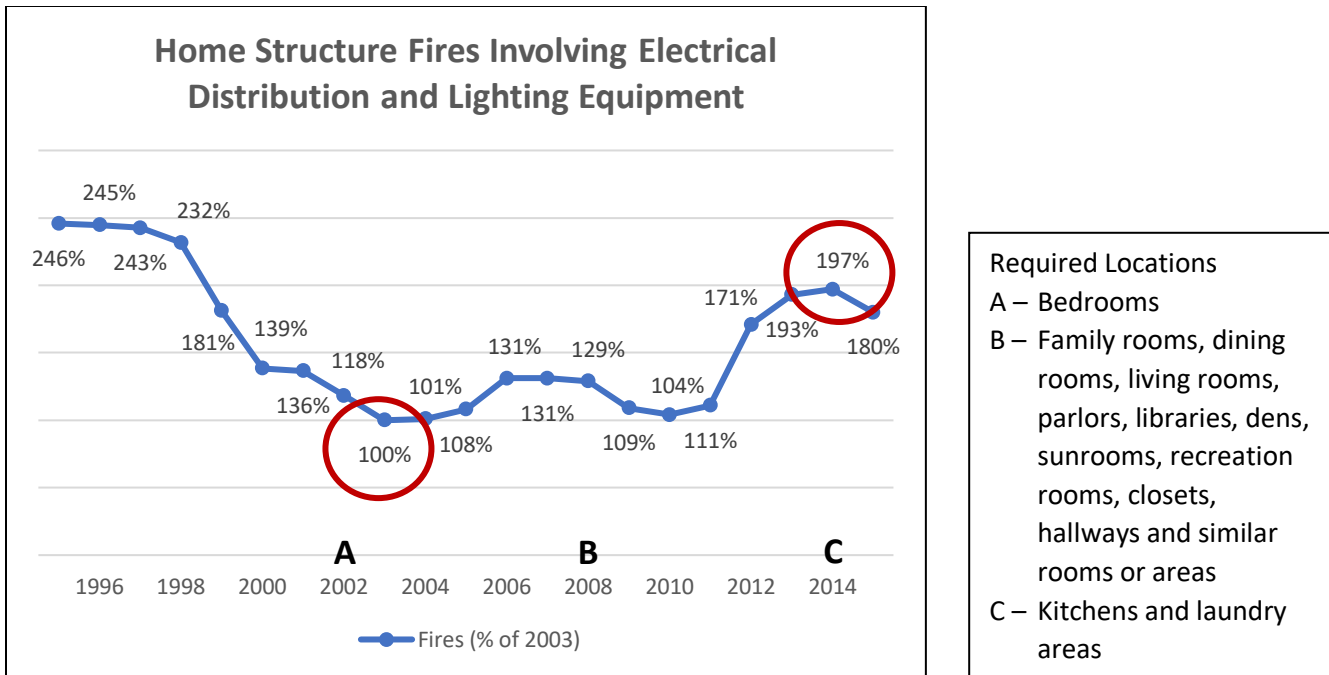


Figure 3

Source: [Home Fires Caused by Electrical Distribution and Lighting Equipment: Supporting Tables](https://bit.ly/3LlBAmk) (https://bit.ly/3LlBAmk), Feb. 2022, NFPA

Note: Because of low participation in NFIRS Version 5.0 during 1999-2001, data from these years is not considered reliable.

Kitchens and laundry areas are being deleted from the list because they are the primary locations for appliances that experience incompatibility issues causing unnecessary tripping. And they were the last areas to be added to the list. Since then, there has been mounting evidence that these devices do not offer the benefits they were designed for.

Similar amendments have been adopted in Arkansas, North Carolina, Oregon and Wisconsin. Idaho and Tennessee limit AFCIs to bedroom circuits. Montana, Virginia and Wisconsin have exempted kitchens or kitchen countertops from requiring AFCIs. And Indiana, Michigan and Utah have completely removed the requirement for AFCIs for single-family homes. In all, nineteen states have amended the code to remove or reduce AFCI requirements.

July 16, 2024

Mr. Sean Lyons, President
South Dakota Electrical Commission

TO: electrical@state.sd.us

Re: Proposal amending Administrative Rule 20:44:14:01 to adopt the 2023 National Electrical Code

Dear Mr. Lyons:

The Association of Home Appliance Manufacturers (AHAM) respectfully submits the following comments to the South Dakota Electrical Commission (SDEC) on the [Proposed Rule](#) to amend Administrative Rule 20:44:14:01.

AHAM supports SDEC in its efforts to maintain a state electrical code. However, AHAM has concerns with the proposal to adopt the 2023 National Electrical Code (NEC), in particular Articles 210.8(A) and 210.8(D). Both articles deal with shock protection provided by Ground-Fault Circuit-Interrupters (GFCIs). Compared to the 2020 NEC, the 2023 edition requires GFCIs in more locations within the home and requires GFCI protection for more appliances. Due to unacceptable levels of nuisance tripping, home appliance manufacturers request the following amendments to the South Dakota electrical code: strike “through 250-volt” in 210.8(A), replace “Kitchens” with “Kitchens – where the receptacles are installed to serve the countertop surfaces” in 210.8(A), and strikeout items (8) through (12) in 210.8(D).

I. GFCIs need to be modernized.

The GFCI was first introduced into the NEC when electrical loads in the home were operating on 60 Hertz (Hz) electricity. Because of this uniform 60Hz operation, GFCIs based tripping requirements upon 60Hz measurements. The same GFCI trip and no trip requirements remain in place today.

Present requirements for GFCI tripping are in contrast with electronic loads in today’s home. Virtually every modern mains-connected appliance has parts that operate at frequencies other than 60Hz. This change is due to the implementation of components like LED drivers, switched-mode power supplies, and variable frequency drives. Modern components have been implemented to meet consumer demands but also to comply with mandatory energy efficiency regulations set by the [U.S. Department of Energy](#) and state regulators.

As electrical loads in the home have been modernized, GFCIs need to be modernized as well. Presently, there are no existing requirements for how a GFCI shall react to frequencies higher than 60Hz. This lack of standardization allows any GFCI manufacturer to choose any trip threshold for higher frequencies. Some GFCI manufacturers have set trip thresholds such that the device is oversensitive and trips on safe levels of high frequency emissions for which there are no known health risks. This is commonly known as nuisance tripping—cases where critical appliances are operating at safe conditions, but the GFCI trips anyways, improperly disabling the appliance.

Nuisance tripping on modern, safe, efficient home appliances has been proven by a [3rd party study](#). UL Solutions connected three appliances to ten different GFCIs. Nuisance tripping occurred on each of the three appliances. When UL analyzed and tested these appliances, no hazardous electrical conditions were observed. Until GFCIs are modernized, nuisance tripping will continue to disable appliances in good working order, removing critical utility from the home such as the ability to maintain a safe indoor temperature and the ability to store/prepare food.

II. Other regulatory bodies have acted on GFCI nuisance tripping

GFCI nuisance tripping is happening across the county. These issues come up so often that other states have already acted to prevent nuisance tripping by deviating from the National Electrical Code to not require GFCIs in some instances, better ensuring that critical appliances can be used when needed by the consumer. Examples include [Georgia](#), [Iowa](#), [Massachusetts](#), [North Carolina](#), [Oregon](#), and [South Carolina](#).

The Consumer Product Safety Commission (CPSC) has also written a [staff opinion letter](#). CPSC staff asks that UL standards be updated to avoid nuisance tripping and, “In the interest of continuing and further improving electrical shock safety and keeping consumers safe, CPSC staff believes it is imperative that the installation codes ... and the many electrical end-product standards, work together.” AHAM asks that SDEC wait until UL standards are updated before expanding requirements to install GFCIs in the home.

III. Safety standards are being updated

Home appliance manufacturers have a role to play in reducing nuisance tripping. The home appliance industry is continuing to work on updating products as well as standards to prevent nuisance tripping. AHAM encourages SDEC to look at the recently published updates in UL 858, Safety Standard for Household Electric Ranges, and UL 101, Safety Standard for Leakage Current of Utilization Equipment.

We have not yet seen published updates to the GFCI standard, UL 943. AHAM believes this GFCI standards work needs to be completed, published, and made effective before

GFCI installation requirements can be expanded in electrical codes, as is seen in the 2023 NEC.

AHAM asks that SDEC take a holistic approach to safety in the home. Appliances like refrigerators, room air conditioners, and cooktops are critical for the safety and well-being of the consumer. Just because GFCIs have been able to protect such appliances in the past, does not mean that GFCIs can adequately protect appliances today.

Again, AHAM asks that South Dakota amend the 2023 NEC as follows: strike “through 250-volt” in 210.8(A), replace “Kitchens” with “Kitchens – where the receptacles are installed to serve the countertop surfaces” in 210.8(A), and strikeout items (8) through (12) in 210.8(D). If not adopting these amendments, at the very least, SDEC should allow removal of the GFCI when nuisance tripping occurs.

AHAM appreciates the opportunity to submit these comments on SDEC’s electrical code rulemaking and would be glad to discuss these matters in more detail should you so request.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read "Randall Cooper". The signature is fluid and cursive, with the first name being more prominent than the last.

Randall Cooper

Vice President of Technical Operations and Standards

About AHAM: AHAM represents more than 150 member companies that manufacture 90% of the major, portable and floor care appliances shipped for sale in the U.S. Home appliances are the heart of the home, and AHAM members provide safe, innovative, sustainable and efficient products that enhance consumers’ lives. The home appliance industry is a significant segment of the economy, measured by the contributions of home appliance manufacturers, wholesalers, and retailers to the U.S. economy. In all, the industry drives nearly \$200 billion in economic output throughout the U.S. and manufactures products with a factory shipment value of more than \$50 billion.



Lewis & Clark Home Builders Association

July 10, 2024

South Dakota Electrical Commission
Department of Labor
217 West Missouri Avenue
Pierre, South Dakota 57501

Re: Proposed Amendment to ARSD 20:44:14:01(12)

Dear Commissioners:

On behalf of Lewis and Clark Home Builders in the Yankton and surrounding area, we are writing in opposition to proposed amendments to ARSD 20:44:14:01(12).

LCHBA represent 50 builders and affiliates engaged in business of constructing and remodeling homes in Yankton, including companies that provide materials and services for these projects. Our members and their customers are directly affected by changes in local building codes. They feel the impact of new regulations on the cost of housing and deal with consequences of ill-conceived regulations.

We recognize that building codes play an important role in protecting public health and safety, and we support reasonable, cost-effective regulations to achieve these outcomes. Model building codes such as the National Electrical Code (NEC) are useful guidelines for developing local regulations, but they should not simply be adopted verbatim and without careful consideration of the relative costs and benefits.

Based on these principles, we respectfully urge the Commission to retain the following local exceptions to the 2020 NEC, which are codified in subsections (a) through (f) of ARSD 20:44:14:01(12):

- *GFCIs for Outdoor Outlets.* Exception to requirement in Section 210.8(F) for outdoor outlets up to 150 volts and 50 amperes to have GFCI protection.
- *Surge Protection.* Exception to requirement in Section 230.67 for all services supplying dwelling units to be provided with a surge-protection device.
- *GFCIs for 250 Receptacles.* Exception to requirement in Section 210.8(A) for receptacles serving 240-volt appliances to have GFCI (ground fault circuit interceptor) protection when located in bathrooms, crawl spaces, basements, laundry areas, or within 6 feet of sinks, bathtubs, or showers.
- *Receptacles near Bathtub and Shower Spaces.* Exception to provision in Section 406.9(C) prohibiting the installation of any receptacle within 3 feet of a bathtub or shower stall unless the bathroom is not large enough to accommodate the required distance.

Initially, the Commission adopted the 2020 NEC without these exceptions. After the Legislature's Rules Review Committee remanded the rules to the Commission based on concerns raised by SDHBA and other interested parties, the Commission held another hearing and adopted the 2020 NEC with the four exceptions. Now the Commission is proposing to adopt the 2023 NEC without the exceptions to Section 230.67, 210.8(A), and 406.9(c).

These local exceptions made sense then, and they make sense now. The Commission has not explained why the exceptions are no longer appropriate. What circumstances have changed in the past three years? According to the attached analysis from the National Association of Home Builders (Exhibit A), eliminating these exceptions will materially increase the cost of housing without providing significant improvements in safety and functionality.

We also urge the Commission to exempt the following appliances from the GFCI-protection requirement in Section 210.8(D) of the 2023 NEC, regardless of where the appliance is located:

- Electric ranges
- Wall-mounted ovens
- Counter-mounted cooking units
- Clothes dryers
- Microwave ovens

As the analysis from the National Home Builders Association shows, GFCI devices are not always compatible with modern 250-volt appliances and can cause nuisance tripping. Nuisance tripping is not just an inconvenience. It also poses a health and safety risks. When nuisance tripping occurs, frustrated homeowners often blame the contractor who installed the device and demand that it be removed. This defeats the purpose of the regulatory requirement and increases costs.

By adopting the 2023 NEC with these local exceptions, the Commission can promote public safety without subjecting homeowners to unnecessary costs and the inconvenience of electrical devices that do not operate as intended.

Thank you for your consideration.

Sincerely,



Ryan Chartier, LCHBA President
K Construction

Pete Steffen - Steffen Construction
Jason Finck – K Real Estate Holdings
Jamie Hejna – Larry's Heating & Cooling
Brent Parry – Mead Lumber
Robert Edwards – Robert Edwards Construction
Dan Specht – Vision Real Estate Services



July 12, 2024

South Dakota Electrical Commission
Department of Labor & Regulation
217 W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:01 (12)

Dear Commissioners:

The Home Builders Association of the Sioux Empire (HBASE) is contacting you regarding opposition to proposed amendments to ARSD 20:44:14:01(12).

HBASE serves the building industry in the Sioux Empire by responsibly meeting the housing needs and engaging our membership in all aspects of the home building industry.

The building industry in the Sioux Empire continues to grow and develop. This is evident with the Sioux Falls MSA population estimated to be 297,200 and accounting for 32 percent of the state's population. With a growing population there are challenges with developing affordable housing to meet the area's workforce needs.

HBASE believes building codes and standards should assure the safety and health of building occupants using the most cost-effective requirements and guidelines. In each code development cycle, there are a myriad of code changes proposed at the national level that would, if approved, significantly increase the cost of constructing new homes and reduce housing affordability. Many are not based on sound technical data and/or are not cost effective. Under these circumstances, HBASE encourages state commissions and local board to consider amendments when new regulations and standards add unnecessary costs to the construction of homes without any actual benefit being derived.

Having reviewed the 2023 National Electrical Code (NEC), HBASE recommends the Commission retain the following local exceptions to the 2020 NEC, codified in subsections (a) through (f) of ARSD 20:44:14:01(12):

- *GFCIs for Outdoor Outlets.* Exception to requirement in Section 210.8(F) for outdoor outlets up to 150 volts and 50 amperes to have GFCI protection.
- *Surge Protection.* Exception to requirement in Section 230.67 for all services supplying dwelling units to be provided with a surge-protection device.

- *GFCIs for 250 Volt Receptacles.* Exception to requirement in Section 210.8(A) for receptacles serving 240-volt appliances to have GFCI (ground fault circuit interrupter) protection when located in bathrooms, crawl spaces, basements, laundry areas, or within 6 feet of sinks, bathtubs, or showers.
- *Receptacles near Bathtub and Shower Spaces.* Exception to provision in Section 406.9(C) prohibiting the installation of any receptacle within 3 feet of a bathtub or shower stall unless the bathroom is not large enough to accommodate the required distance.

HBASE also recommends the Commission review and exempt the following appliances from the GFCI-protection requirement in Section 210.8(D) of the 2023 NEC, regardless of where the appliance is located:

- Electric ranges
- Wall mounted ovens
- Counter-mounted cooking units
- Clothes dryers
- Microwave ovens

When reviewing updates to potentially new codes, HBASE solicits feedback from our members on substantial changes with each code. HBASE received feedback on the 2023 NEC with the most comments centered on nuisance tripping with GFCI outlets. While GFCIs were originally designed to address shock hazards related to “wet environments” like bathrooms or kitchens counter appliances, they are now being connected to major appliances such as refrigerators, cooking ranges, and laundry appliances.

Builders and electrical contractors in the Sioux Empire have provided many instances of GFCI outlets causing issues for new homeowners most commonly associated with GFCI receptacles. When these situations occur, builders and electricians receive calls from the homeowner asking why their outlets stopped working. The consumer wants to know if their home has been wired correctly and more times than not, the issue of nuisance tripping is the culprit. This has been especially evident with the use of GFCIs for electric ranges becoming an increasingly more common occurrence.

Builders and electricians have reported GFCI nuisance tripping issues with new kitchen appliances like microwaves and refrigerators. When outdated GFCI’s are connected to modern appliances, nuisance tripping occurs as power to the appliance is cut when no hazard is present. It is not uncommon to find builders and electricians at the receiving line of an angry homeowner, frustrated that their new appliances won’t work correctly. Other situations like this are unfortunately becoming more common. A local builder who specializes in first time home buyers recounted a situation where the new homeowner had left on a business trip for four days only to come home and find a refrigerator having lost power. This led to the homeowner asking if they had a faulty refrigerator only to discover the issue was a GFCI outlet being the cause. The homeowner also had to clean out the refrigerator and replace the spoiled food.

More recently builders are reporting GFCI nuisance tripping issues with sump pumps. These types of issues have gained traction with recent flooding in the area. Despite calling in electricians and builders, homeowners often think it's due to poor construction quality, but it's really the GFCI outlets being overly sensitive creating dissatisfaction. Overall, when nuisance tripping occurs, frustrated homeowners often blame the builder who installed the device and demand that it be removed. This defeats the purpose of the regulatory requirement and increases costs.

By adopting the 2023 NEC with these local exceptions, the Commission can promote public safety without subjecting homeowners to unnecessary costs and the inconvenience of electrical devices that do not operate as intended. As a Board representing over 1,000 members in the home building industry in the Sioux Empire, we thank you for your consideration.

Sincerely,

Home Builders Association of the Sioux Empire Board of Directors

Joel Ingle
C-Lemme Companies

Adam Balding
Budget Blinds of Sioux Falls

Brad Hair
A-Plus Construction

Candi Menke
Black Hills FCU

Cory Hjellming
Hjellming Construction

Craig Wynia
Jeren Homes

Daniel Glammeier
Glammeier Homes

Doug Jop
Top Construction

Erik Christensen
Trademark Homes

Jesse Deffenbaugh
Deffenbaugh Homes

Jim Dunham
Jim Dunham & Assoc.

Jon Beatch
Beatch Construction

Jordan Hefner
Hefner Construction

Julie Redlin
Rainbow Restoration

Kris Graff
Anthem Title Escrow Services

Kyle Cosand
Cosand Construction

Peter Ronning
Ronning Construction

Preston Mettler
First Choice Development

Russ Pies
Builders FirstSource

Ruth Ann Scott
The Living Door

Ryan Brauer
Choice Builders

Sabrina Meierhenry
Land Title Guaranty

Tom DeHaven
CorTrust Mortgage

Will DeWitt
Concrete Outdoor Living



South Dakota Electrical Commission
Department of Labor & Regulation
217 W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:10 (12)

Dear Commissioners:

On behalf of the REALTOR® Association of the Sioux Empire (RASE), we are writing to express our concerns about the Commission's proposed amendment to ARSD 20:44:14:10 (12). RASE represents over 1300 licensed real estate agents and affiliates throughout the Sioux Empire Area and advocates for affordable and safe housing.

RASE opposes the adoption of the 2023 NEC without the following exceptions:

1. 210.8 (F) – GFCI for AC units
2. 230.67 – Surge protection
3. 210.8 (A) – GFCI for 250 Volt
4. 406.9 (c) – Bathroom GFCI

There is no evidence showing that circumstances have substantially changed in the past three years, and the exceptions are no longer appropriate. Deleting these exceptions will increase the cost of housing.

In addition to maintaining these exceptions, RASE urges the Commission to specifically exempt the following appliances from the GFCI-protection requirement under Section 210.8(D), regardless of where the appliance is located:

1. electric ranges,
2. wall-mounted ovens,
3. counter-mounted cooking units,



4. clothes dryers, and

5. microwave ovens

Requiring these 240-volt appliances to be connected to a GFCI device not only adds unnecessary costs to a housing project but occasionally causes nuisance tripping because some appliances are simply not compatible with a GFCI device.

For these reasons, we respectfully request that you retain the 2020 exceptions to the NEC and add an exception to the GFCI-protection requirement for certain appliances.

Thank you for your consideration. We appreciate your service on the Commission.

Sincerely,

Kate Patrick

RASE President

REALTOR® Association of the Sioux Empire

Jack Zika

RASE CEO

REALTOR® Association of the Sioux Empire



July 15, 2024

South Dakota Electrical Commission
Department of Labor & Regulation 217
W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:10 (12)

Dear Commissioners:

On behalf of the South Dakota Multi-Housing Association (SDMHA), we are writing to express our concern with the Commission's proposed amendment to ARSD 20:44:14:10 (12). This change will impact rental properties and their ability to provide cost-effective and reliable housing options. SDMHA represents rental property owners/managers and suppliers throughout South Dakota.

We urge the Commission to specifically exempt the following appliances from the GFCI-protection requirement under Section 210.8(D), regardless of where the appliance is located:

1. electric ranges,
2. wall-mounted ovens,
3. counter-mounted cooking units,
4. clothes dryers, and
5. microwave ovens

The requirement that these 240-volt appliances be connected to a GFCI device has presented substantial challenges for rental property owners. While the intent of these devices is to enhance safety, their implementation has led to unforeseen and unnecessary costs, particularly in properties designed to offer affordable housing to our workforce. Properties have also experienced frequent nuisance tripping due to some appliances not compatible with a GFCI device. This issue is exacerbated by the fact that many renters are not fully aware of building codes and the specific operational characteristics of GFCI devices. Consequently, this leads to repeated maintenance calls, tenant dissatisfaction, and increased operational expenses for property owners.

For these reasons, we respectfully request that you retain the 2020 exceptions to the NEC and add an exception to the GFCI-protection requirement for certain appliances.

Also in 2020, the South Dakota Electrical Commission adopted the 2020 National Electrical Code (NEC) with the following exceptions, which are codified under ARSD 20:44:14:10 (12):

1. 210.8 (F) – GFCI for AC units
2. 230.67 – Surge protection
3. 210.8 (A) – GFCI for 250 Volt
4. 406.9 (c) – Bathroom GFCI

Originally, the Commission adopted the 2020 NEC without these exceptions. The Interim Rules Review Committee, however, remanded ARSD 20:44:14:10 (12) to the Commission based on concerns raised by the South Dakota Home Builders Association. The Commission then held another hearing on ARSD 20:44:14:10(12) and adopted the 2020 NEC with the four exceptions. Now, the Commission is proposing to adopt the 2023 NEC without the exceptions to Sections 230.67, 210.8 (A), and 406.9 (c).

SDMHA opposes the adoption of the 2023 NEC without these exceptions. In 2020, the Commission determined that the exceptions were appropriate. There is no evidence showing that circumstances have substantially changed in the past three years, and the exceptions are no longer appropriate. Deleting these exceptions will increase the cost of workforce affordable housing while providing only minimal safety benefits.

We appreciate your service on the Commission, and we thank you for your consideration.

Sincerely,



Lydia Freedom, Chair
South Dakota Multi Housing Association



July 18, 2024

South Dakota Electrical Commission
Department of Labor & Regulation
217 W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:01 (12)

Dear Commissioners:

This letter is in response to the Commission's Notice of Public Hearing to Adopt Rules. Specifically, I am writing to share my concerns about the Commission's proposal to adopt the 2023 National Electrical Code (NEC). According to the Commission's Small Business Impact Statement, adopting the 2023 NEC will "increase the cost of materials for building a new home" and "result in higher build prices from electrical contractors."

Affordable housing is one of the biggest problems facing our state. A generation of young, would-be homeowners are being locked out by skyrocketing housing costs. This hurts our state's economy and our local communities.

As a state senator, I have sponsored legislation to address this problem, including a bill creating a \$200 million fund for housing infrastructure loans and grants. But the legislature cannot combat this problem alone. We need state and local administrative agencies to implement cost-effective building regulations.

While model building codes such as the NEC are necessary to protect public health and safety, they also contribute to the rising cost of housing. The drip, drip, drip changes to these model codes have a cumulative impact on construction costs which threatens affordability.

The Commission's proposal to repeal the local exceptions to the 2020 NEC is a step in the wrong direction. These exceptions, which were supported by the home building industry and approved by the Legislature's Rules Review Committee, provide much-needed relief from the regulatory costs imposed by the NEC. When the Commission adopted these exceptions, it was fully advised of the arguments for and against them, including safety concerns. Nothing has changed since 2020, expect that the median price of a home in South Dakota has increased by \$75,000. Therefore, I urge the Commission to retain these local exceptions.

I also urge the Commission to provide a local exception to Section 210.8(D) of the 2023 NEC which expands the list of appliances that must be served a GFCI-protected outlet. It is common

knowledge that GFCI devices are not compatible with certain appliances and can cause nuisance tripping when connected to them. Homeowners should not be compelled to pay for electrical devices that do not work properly.

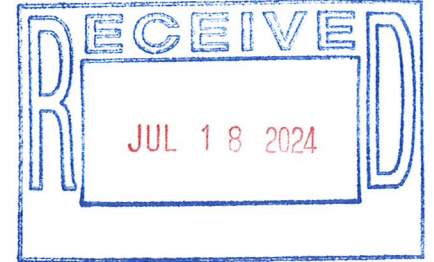
Adopting the 2023 NEC will increase housing costs. But the Commission can mitigate the impact of these increases by retaining the local exceptions adopted in 2020 and providing an exception to Section 210.8(D).

Thank you for the opportunity to comment on the proposed rules. And thank you for your service on the Commission.

Sincerely,



Casey Crabtree
Senate Majority Leader
Casey.Crabtree@sdlegislature.gov



July 14, 2024

South Dakota Electrical Commission
Department of Labor & Regulation
217 W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:01 (12)

Dear Commissioners:

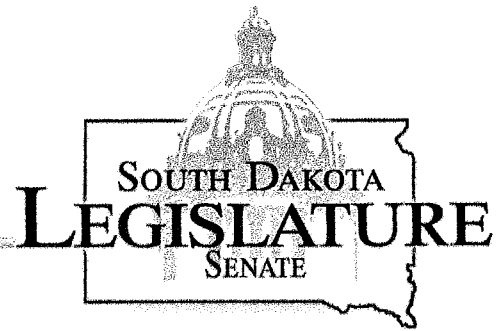
This letter is in response to the Electrical Commission's notice of public hearing to consider the adoption of proposed amendments to ARSD § 20:44:14:10(12).

As a home builder and a state senator, I am concerned about the impact of building codes on the cost of housing projects. These regulations typically add to the cost of construction, which makes housing less affordable for many families. Affordable housing is a critical problem in South Dakota where the median home price has increased by \$75,000 in the past four years.

I recognize that building codes are intended to protect public health and safety. But in some instances, the cost of complying with the regulations exceeds the actual benefits to be derived from the regulations or compliance creates unintended adverse consequences. That is why I am concerned about the Commission's proposed amendments to our state's electrical code.

When the Commission was considering adoption of the 2020 National Electrical Code, I, and other interested parties, including the South Dakota Home Builders Association and the South Dakota Housing Development Authority, urged the Commission to provide certain exceptions to the Code. Initially, the Commission rejected our request. But after the Legislature's Rules Review Committee remanded the rules to the Commission for further consideration, the Commission agreed to incorporate some of the exceptions.

Now the Commission is proposing to adopt the 2023 National Electrical Code without the agreed upon exceptions to Sections 230.67, 210.8, and 406.9(c). I am not aware of any evidence showing that these exceptions have resulted in injury to persons or property in South Dakota. But



I do know that eliminating these exceptions will increase housing costs. Therefore, I urge the Commission to retain these local exceptions to the Code.

I also urge the Commission to exempt major appliances from the GFCI installation requirements under Section 210.8(D) of the 2023 National Electric Code. GFCIs were designed to address shock hazards related to bathroom and kitchen countertop appliances. They are not yet compatible with today's major appliances such as refrigerators, laundry appliances and cooking ranges. When CFCIs are connected to these modern appliances, they trip and cut power to the appliance even though there is no shock hazard. This is not only a nuisance for homeowners but can cause damage to refrigerated products.

Adopting the 2023 National Electrical Code with these local exceptions will further the Commission's goal of protecting public health and safety without subjecting homeowners to unnecessary costs and ineffective regulatory requirements.

Thank you for considering my comments. And thank you for your service on the Commission.

Sincerely,

A handwritten signature in black ink, appearing to read "Herman Otten". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Herman Otten



July 12, 2024

South Dakota Electrical Commission
Department of Labor & Regulation
217 W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:01 (12)

Dear Commissioners:

The Home Builders Association of the Sioux Empire (HBASE) is contacting you regarding opposition to proposed amendments to ARSD 20:44:14:01(12).

HBASE serves the building industry in the Sioux Empire by responsibly meeting the housing needs and engaging our membership in all aspects of the home building industry.

The building industry in the Sioux Empire continues to grow and develop. This is evident with the Sioux Falls MSA population estimated to be 297,200 and accounting for 32 percent of the state's population. With a growing population there are challenges with developing affordable housing to meet the area's workforce needs.

HBASE believes building codes and standards should assure the safety and health of building occupants using the most cost-effective requirements and guidelines. In each code development cycle, there are a myriad of code changes proposed at the national level that would, if approved, significantly increase the cost of constructing new homes and reduce housing affordability. Many are not based on sound technical data and/or are not cost effective. Under these circumstances, HBASE encourages state commissions and local board to consider amendments when new regulations and standards add unnecessary costs to the construction of homes without any actual benefit being derived.

Having reviewed the 2023 National Electrical Code (NEC), HBASE recommends the Commission retain the following local exceptions to the 2020 NEC, codified in subsections (a) through (f) of ARSD 20:44:14:01(12):

- *GFCIs for Outdoor Outlets.* Exception to requirement in Section 210.8(F) for outdoor outlets up to 150 volts and 50 amperes to have GFCI protection.
- *Surge Protection.* Exception to requirement in Section 230.67 for all services supplying dwelling units to be provided with a surge-protection device.

- *GFCIs for 250 Volt Receptacles.* Exception to requirement in Section 210.8(A) for receptacles serving 240-volt appliances to have GFCI (ground fault circuit interrupter) protection when located in bathrooms, crawl spaces, basements, laundry areas, or within 6 feet of sinks, bathtubs, or showers.
- *Receptacles near Bathtub and Shower Spaces.* Exception to provision in Section 406.9(C) prohibiting the installation of any receptacle within 3 feet of a bathtub or shower stall unless the bathroom is not large enough to accommodate the required distance.

HBASE also recommends the Commission review and exempt the following appliances from the GFCI-protection requirement in Section 210.8(D) of the 2023 NEC, regardless of where the appliance is located:

- Electric ranges
- Wall mounted ovens
- Counter-mounted cooking units
- Clothes dryers
- Microwave ovens

When reviewing updates to potentially new codes, HBASE solicits feedback from our members on substantial changes with each code. HBASE received feedback on the 2023 NEC with the most comments centered on nuisance tripping with GFCI outlets. While GFCIs were originally designed to address shock hazards related to “wet environments” like bathrooms or kitchens counter appliances, they are now being connected to major appliances such as refrigerators, cooking ranges, and laundry appliances.

Builders and electrical contractors in the Sioux Empire have provided many instances of GFCI outlets causing issues for new homeowners most commonly associated with GFCI receptacles. When these situations occur, builders and electricians receive calls from the homeowner asking why their outlets stopped working. The consumer wants to know if their home has been wired correctly and more times than not, the issue of nuisance tripping is the culprit. This has been especially evident with the use of GFCIs for electric ranges becoming an increasingly more common occurrence.

Builders and electricians have reported GFCI nuisance tripping issues with new kitchen appliances like microwaves and refrigerators. When outdated GFCI’s are connected to modern appliances, nuisance tripping occurs as power to the appliance is cut when no hazard is present. It is not uncommon to find builders and electricians at the receiving line of an angry homeowner, frustrated that their new appliances won’t work correctly. Other situations like this are unfortunately becoming more common. A local builder who specializes in first time home buyers recounted a situation where the new homeowner had left on a business trip for four days only to come home and find a refrigerator having lost power. This led to the homeowner asking if they had a faulty refrigerator only to discover the issue was a GFCI outlet being the cause. The homeowner also had to clean out the refrigerator and replace the spoiled food.

More recently builders are reporting GFCI nuisance tripping issues with sump pumps. These types of issues have gained traction with recent flooding in the area. Despite calling in electricians and builders, homeowners often think it's due to poor construction quality, but it's really the GFCI outlets being overly sensitive creating dissatisfaction. Overall, when nuisance tripping occurs, frustrated homeowners often blame the builder who installed the device and demand that it be removed. This defeats the purpose of the regulatory requirement and increases costs.

By adopting the 2023 NEC with these local exceptions, the Commission can promote public safety without subjecting homeowners to unnecessary costs and the inconvenience of electrical devices that do not operate as intended. As a Board representing over 1,000 members in the home building industry in the Sioux Empire, we thank you for your consideration.

Sincerely,

Home Builders Association of the Sioux Empire Board of Directors

Joel Ingle

C-Lemme Companies

Adam Balding

Budget Blinds of Sioux Falls

Brad Mair

A-Plus Construction

Candi Menke

Black Hills FCU

Cory Hjellming

Hjellming Construction

Craig Wynia

Jeren Homes

Daniel Glammeier

Glammeier Homes

Doug Jop

Top Construction

Erik Christensen

Trademark Homes

Jesse Deffenbaugh

Deffenbaugh Homes

Jim Dunham

Jim Dunham & Assoc.

Jan Beatch

Beatch Construction

Jordan Hefner

Hefner Construction

Julie Redlin

Rainbow Restoration

Kris Graff

Anthem Title Escrow Services

Kyle Cosand

Cosand Construction

Peter Ronning

Ronning Construction

Prestan Mettler

First Choice Development

Russ Pies

Builders FirstSource

Ruth Ann Scott

The Living Door

Ryan Brauer

Choice Builders

Sabrina Meierhenry

Land Title Guaranty

Tom DeHaven

CorTrust Mortgage

Will DeWitt

Concrete Outdoor Living



April 11, 2024

South Dakota Electrical Commission
Department of Labor & Regulation
217 W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:10 (12)

Dear Commissioners:

On behalf of the South Dakota Home Builders Association (SDHBA), we are writing to express our concerns about the Commission's proposed amendment to ARSD 20:44:14:10 (12). SDHBA represents persons engaged in the home building industry throughout South Dakota and advocates for affordable and safe housing.

In 2020, the South Dakota Electrical Commission adopted the 2020 National Electrical Code (NEC) with the following exceptions, which are codified under ARSD 20:44:14:10 (12):

1. 210.8 (F) – GFCI for AC units
2. 230.67 – Surge protection
3. 210.8 (A) – GFCI for 250 Volt
4. 406.9 (c) – Bathroom GFCI

Originally, the Commission adopted the 2020 NEC without these exceptions. The Interim Rules Review Committee, however, remanded ARSD 20:44:14:10 (12) to the Commission based on concerns raised by SDHBA. The Commission then held another hearing on ARSD 20:44:14:10 (12) and adopted the 2020 NEC with the four exceptions. Now, the Commission is proposing to adopt the 2023 NEC without the exceptions to Sections 230.67, 210.8 (A), and 406.9 (c).

SDHBA opposes the adoption of the 2023 NEC without these exceptions. In 2020, the Commission determined that the exceptions were appropriate. There is no evidence showing that circumstances have substantially changed in the past three years, and the exceptions are no longer appropriate. Deleting these exceptions will increase the cost of housing while providing only minimal safety benefits.

In addition to maintaining these exceptions, SDHBA urges the Commission to specifically exempt the following appliances from the GFCI-protection requirement under Section 210.8(D), regardless of where the appliance is located:

1. electric ranges,
2. wall-mounted ovens,
3. counter-mounted cooking units,
4. clothes dryers, and
5. microwave ovens

Requiring these 240-volt appliances to be connected to a GFCI device not only adds unnecessary costs to a housing project but occasionally causes nuisance tripping because some appliances are simply not compatible with a GFCI device.

For these reasons, we respectfully request that you retain the 2020 exceptions to the NEC and add an exception to the GFCI-protection requirement for certain appliances.

Thank you for your consideration. We appreciate your service on the Commission.

Sincerely,

Peter Ronning

Peter Ronning
SDHBA Legislative Chairman
South Dakota Home Builders Association

Tony Kneeland

Tony Kneeland
SDHBA President
South Dakota Home Builders Association

Watertown Area Home Builders Association

Serving Clark, Codington, Day, Deuel, Grant, Hamlin & Roberts Counties

Affiliated with:



WAHBA

"The Watertown Area Home Builders Association is a non-profit organization of professionals dedicated to promoting the building industry through education, advocacy & community involvement."

Address:

110 8th Ave SE—Ste 2
P.O. Box 1271
Watertown, SD 57201

Phone:

(605)-878-3033

E-mail Address:

wahba.sd@gmail.com

Website:

watertownhomebuilders.com

Office Hours:

10:00 a.m.—3:00 p.m.
Monday-Friday



President:

Neil Jensen

1st Vice President:

Craig Johnson

2nd Vice President:

(open position)

Treasurer:

Tia Hutt

Past President:

Tony Kneeland

Executive Officer:

Julie Kneeland
(cell) 605-520-0661

Local Directors:

Carrie Bartscher
Mark Hartwig

State Directors:

Aaron Hansen
Craig Johnson
Reid Peterson
Trent Theye

Alt. State Directors:

Christian Olson
DJ York

August 14, 2024

South Dakota Electrical Commission
Department of Labor & Regulation
217 W. Missouri Ave.
Pierre, SD 57501

Re: Proposed Amendment to ARSD 20:44:14:01 (12)

Dear Commissioners:

The Watertown Area Home Builders Association (WAHBA) is contacting you regarding opposition to proposed amendments to ARSD 20:44:14:01(12).

Having reviewed the 2023 National Electrical Code (NEC), WAHBA recommends the Commission retain the following local exceptions to the 2020 NEC, codified in subsections (a) through (f) of ARSD 20:44:14:01(12):

- GFCIs for Outdoor Outlets. Exception to requirement in Section 210.8(F) for outdoor outlets up to 150 volts and 50 amperes to have GFCI protection.
- Surge Protection. Exception to requirement in Section 230.67 for all services supplying dwelling units to be provided with a surge-protection device.
- GFCIs for 250 Volt Receptacles. Exception to requirement in Section 210.8(A) for receptacles serving 240-volt appliances to have GFCI (ground fault circuit interrupter) protection when located in bathrooms, crawl spaces, basements, laundry areas, or within 6 feet of sinks, bathtubs, or showers.
- Receptacles near Bathtub and Shower Spaces. Exception to provision in Section 406.9(C) prohibiting the installation of any receptacle within 3 feet of a bathtub or shower stall unless the bathroom is not large enough to accommodate the required distance.

WAHBA also recommends the Commission review and exempt the following appliances from the GFCI-protection requirement in Section 210.8(D) of the 2023 NEC, regardless of where the appliance is located:

- Electric ranges
- Wall mounted ovens
- Counter-mounted cooking units
- Clothes dryers
- Microwave ovens

By adopting the 2023 NEC with these local exceptions, the Commission can promote public safety without subjecting homeowners to unnecessary costs and the inconvenience of electrical devices that do not operate as intended. We thank you for your consideration.

Sincerely,

Cody Cannon
Cannon Electric

Charlotte Andres
Fine Line Renovation

Trent Theye
Theye Construction

Craig Johnson
East River Contracting

Mark Hartwig
Hartwig Heating

Shelby Kerkvliet
Coteau Prairie Homes

Chad Flemming
Steinmetz Redi Built Homes

Tony Kneeland
Glass Products

Tia Hutt
Dacotah Bank

Aaron Hansen
Meyer Insurance

Matt Moyer
Moyer Construction

Ryan Lawrence
Ultimate Construction

Neil Jensen
Benchmark Foam

Carrie Bartscher
Grassland Granite

Christian Olson
Olson Contracting

F. Proposed Fee Increases

Here is the information currently on our website regarding our current fee schedule.

Fees for Inspections

Wiring Permits are \$15 each or a book of 20 for \$300

The Commission conducts the following allotted number of inspections per the calculated fee per the table below. Inspections in addition to the allotted inspection per fee will be assessed at \$75 per residential inspection per each inspection man-hour or fraction thereof.

Minimum fee for requested electrical inspections.

A minimum inspection fee of \$75 for each residential inspection or \$100 for each commercial inspection man-hour, or fraction thereof, is charged for electrical inspections. The policy is in effect as of May 01, 2018, for all outstanding permits. The table includes a link to the Administrative Rule of South Dakota (ARSD) pertinent to each type of installation.

Installation	Criteria	Fee 06/01/20	Allotted Insp. Per Rule
New Houses	0 - 200 amps	\$160.00	RI, F
	201 - 400 amps	\$300.00	2 RI, F
	401 - over	\$300.00 plus circuits	2 RI, F
Services - new	0 - 200 amps	\$60.00 plus circuits Minimum of \$100 fee if permit plus cost doesn't equal \$100	RI, F
	201 - 400 amps	\$75.00 plus circuits Minimum of \$100 fee if	RI, F

		permit plus cost doesn't equal \$100	
	401 - 800 amps	\$100.00 plus circuits	RI, F
	801 - 1600 amps	\$150.00 plus circuits	RI, F
	1601 - over	\$275.00 plus circuits	2 RI, F
Services - replacement	0 - 200 amps	\$100.00 plus new circuits	F
	201 - 400 amps	\$125.00 plus new circuits	F
	401 - 800 amps	\$150.00 plus new circuits	F
	801 - 1600 amps	\$175.00 plus new circuits	F
	1601 - over	\$200.00 plus new circuits	F
Plus Circuits	0 - 30 amps	\$5.00	See above
	31 - 60 amps	\$10.00	
	61 - 100 amps	\$12.00	
	Each additional 100 amps or fraction thereof	\$8.00	
Circuits Install or Alteration		\$50 per circuit*	1 or 2 circuits = 1

		Minimum of \$100 fee if permit plus cost doesn't equal \$100	3 or more circuits = 2
Requested Inspections		\$75/hr Residential; \$100/hr Commercial	1 insp. per \$100
Reinspections		\$75/hr Residential; \$100/hr Commercial	
Remodel Work	First 40 openings or connections (each)	\$2.00	F
	Each additional opening or connection	\$0.50	
	First 40 light fixtures (each)	\$2.00	F
	Each additional lighting fixture	\$0.50	
	Each motor or special equipment	\$6.00	
Apartment Building	Per Unit	\$50.00 Minimum of \$100 fee if permit plus	2 insps. per 4 units

		cost doesn't equal \$100	
Outdoor Signs & Feeders	Each feeder or branch circuit	\$50.00 Minimum of \$100 fee if permit plus cost doesn't equal \$100	F
Irrigation	Service	\$75.00 Minimum of \$100 fee if permit plus cost doesn't equal \$100	F
	Each motor	\$2.00	
Mobile Homes No feeder charge included in these fees.	First unit	\$75.00 Minimum of \$100 fee if permit plus cost doesn't equal \$100	F
	Each additional unit	\$35.00	
RV Parks	Per unit	\$20.00 Minimum of \$100 fee if permit plus cost doesn't equal \$100	F
	Each additional unit	\$20.00	
Range Wells	Per hour will be charged as a	\$100	F

	requested inspection fee		
Swimming Pools	Residential pools	\$150.00	RI, F
Carnivals/Concessions	Per ride or concession	\$10.00	1 insp. per \$100
	Reinspection per unit	\$5.00	Minimum of \$100 fee if permit plus cost doesn't equal \$100
	Per transformer or generator	\$30.00	
Permits		\$15.00	

*Please note each inspection is limited to one hour. Inspections over one hour will utilize an additional allotted inspection per hour or fraction thereof or be charged \$75 per hour or fraction thereof.

Installers will not receive credit for unused allotted inspections.

F. Proposed Fee Increases

Here is some information on our proposed new fee schedule. It was decided after discussion with the inspectors that we are not ready to change the fee schedule and should instead just increase some of the maximum caps following our current schedule.

Suggested changes to statute:

36-16-30. Installation inspection fees--Number of inspections--Promulgation of rules.

The State Electrical Commission may promulgate rules, pursuant to chapter 1-26, to establish and collect installation inspection fees for:

- (1) New residential installations, based on ampere capacity not to exceed six hundred dollars plus circuits;
- (2) Service connections on other installations, based on ampere capacity not to exceed seven hundred fifty dollars plus circuits;
- (3) Circuit installations or alterations, based on ampere capacity not to exceed one hundred dollars;
- (4) Remodeling work for each opening or connection not to exceed six dollars each and three dollars for each additional opening or connection, lighting fixture not to exceed six dollars for the first forty fixtures and not to exceed three dollars for each additional lighting fixture, motor or special equipment not to exceed thirty-six dollars;
- (5) Apartment buildings per unit not to exceed one hundred fifty dollars;
- (6) Outdoor or area lighting to be charged following service and circuits;
- (7) Field irrigation systems to be charged following service and circuits;
- (8) Mobile home service and feeders not to exceed one hundred sixty dollars per unit; recreational vehicle service not to exceed forty dollars per unit;
- (9) Swimming pools will be charged following the per hour maximum;
- (10) Each late correction order or wiring permit procedure not to exceed three hundred dollars;
- (11) Carnivals and seasonal dwellings will be charged following the requested inspection maximum; and
- (13) Modular homes and structures manufactured out-of-state not to exceed three hundred dollars per day plus travel and living expenses.

A minimum fee shall be imposed if any fee calculated under this section is less than one hundred dollars and may not exceed two hundred dollars.

The commission may also promulgate rules, pursuant to chapter 1-26, to set an allotted number of inspections for each installation under this section.

Fees for Inspections

Wiring Permits are \$20 each or a book of 20 for \$400

The Commission conducts the following allotted number of inspections per the calculated fee per the table below. Inspections in addition to the allotted inspection per fee will be assessed at \$100 per inspection man-hour or fraction thereof (\$25/15 minutes).

The table below represents the recommended 30% increases, but we would likely want to try and round these to easier numbers to work with. This is not something we have to decide now and is purely provided for informational purposes to give you an idea.

Installation	Criteria	Fee 06/01/20	Allotted Insp. Per Rule
New Houses	0 - 200 amps	\$200.00	RI, F
	201 - 400 amps	\$300.00	2 RI, F
	401 - over	\$300.00 plus circuits	2 RI, F
Services - new	0 - 200 amps	\$78.00 plus circuits Minimum of \$100 inspection fee	RI, F
	201 - 400 amps	\$98.00 plus circuits Minimum of \$100 inspection fee	RI, F
	401 - 800 amps	\$130.00 plus circuits	RI, F
	801 - 1600 amps	\$195.00 plus circuits	RI, F
	1601 - over	\$358.00 plus circuits	2 RI, F
Services - replacement	0 - 200 amps	\$130.00 plus new circuits	F
	201 - 400 amps	\$163.00 plus new circuits	F
	401 - 800 amps	\$195.00 plus new circuits	F
	801 - 1600 amps	\$228.00 plus new circuits	F
	1601 - over	\$260.00 plus new circuits	F
Plus Circuits	0 - 30 amps	\$6.50	See above
	31 - 60 amps	\$13.00	
	61 - 100 amps	\$15.50	

	Each additional 100 amps or fraction thereof	\$10.50	
Circuits Install or Alteration	\$65 per circuit* Minimum of \$100 inspection fee		1 or 2 circuits = 1
			3 or more circuits = 2
Requested Inspections		\$100/hr	
Reinspections		\$100/hr	
Remodel Work	First 40 openings or connections (each)	\$2.50	F
	Each additional opening or connection	\$0.50	
	First 40 light fixtures (each)	\$2.50	F
	Each additional lighting fixture	\$0.50	
	Each motor or special equipment	\$8.00	
Apartment Building	Per Unit	\$130.00	2 insps. per 4 units
Outdoor Signs & Feeders	Charged as service + circuits		F
Irrigation	Charged as service + circuits		F
Mobile Homes No feeder charge included in these fees.	First unit	\$100.00	F
	Each additional unit	\$45.00	
RV Parks	Per unit	\$25.00 Minimum of \$100 inspection fee	F
	Each additional unit	\$26.00	

Range Wells		\$100/hr	
Swimming Pools		\$100/hr	
Carnivals/Concessions		\$100/hr	
Permits		\$20.00	