

STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS

In the Matter of the Proposed Rules
Adopting and Incorporating the
2020 National Electrical Code for Use in
Minnesota, Minnesota Rules
Chapter 1315

TABLE OF CONTENTS

SUMMARY OF CONCLUSIONS..... 2

FINDINGS OF FACT..... 2

I. Background to the Proposed Rules..... 2

 A. Regulatory Background 2

 B. Overview of Issues..... 3

II. Procedural Requirements of Chapter 14..... 5

 A. Agency Presentation at Hearing 5

 B. Additional Notice Requirements..... 8

 C. Notice Practice..... 8

 D. Impact on Farming Operations..... 8

 E. Statutory Requirements for the SONAR 9

III. Critiques of the Board’s Minn. Stat. § 14.131 Analysis..... 15

 A. General Criticisms..... 15

 B. Regulatory Analysis Factor 1: Classes of Affected Persons 18

 C. Regulatory Analysis Factor 2: Probable Cost to Agencies..... 19

 D. Regulatory Analysis Factor 3: Cost and Intrusiveness..... 19

 E. Regulatory Analysis Factor 4: Alternative Methods for Achieving the Same Purpose..... 21

 F. Regulatory Analysis Factor 5: Costs of Compliance 21

 G. Regulatory Factor 6: Analysis of Costs of Not Adopting Proposed Rule, Including Impacts to Small Businesses and Cities 24

 H. Regulatory Factor 7: Assessment of Differences Between Proposed Rule and Existing Federal Regulations..... 24

I.	Regulatory Factor 8: Assessment of Cumulative Effect of Rule with Other Federal and State Regulations Related to Specific Purpose of the Rule	25
J.	Compliance with Minn. Stat. § 14.131.....	25
IV.	Rulemaking Legal Standards	27
V.	Rule by Rule Analysis	28
A.	2020 NEC Section 210.8(A): Ground-Fault Circuit-Interrupter Protection for Dwelling Units	29
B.	2020 NEC Section 210.8(A)(5) GFCI Protection Basements.....	31
C.	2020 NEC Section 210.8(F): Outdoor Outlets.....	32
D.	2020 NEC Section 210.12 Arc-Fault Circuit-Interrupter (AFCI) Protection....	35
E.	2020 NEC Section 210.52(C)(2): Island and Peninsular Countertops and Work Surfaces.....	37
F.	2020 NEC Section 230.67 Surge-Protective Devices (SPDs).....	38
G.	2020 NEC Section 230.85 Emergency Disconnect, Dwellings	40
H.	2020 NEC Section 314.27(C): Boxes at Ceiling Suspended Paddle Fan Outlets.....	42
I.	2020 NEC Section 406.4(D)(4): Arc-Fault Circuit-Interrupter Protection Replacement.....	44
J.	2020 NEC Section 406.9(C): Receptacles in Bathtub and Shower Space....	44
	CONCLUSIONS	45
	RECOMMENDATION	46

STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS

In the Matter of the Proposed Rules
Adopting and Incorporating the
2020 National Electrical Code for Use in
Minnesota, Minnesota Rules
Chapter 1315

**REPORT OF THE
ADMINISTRATIVE LAW JUDGE**

This matter came before Administrative Law Judge Barbara J. Case for a rulemaking hearing on August 19, 2020. Because of restrictions stemming from the COVID-19 pandemic, the public hearing was held via an interactive video and telephone conference on the Webex platform.

The Minnesota Board of Electricity (Board) and the Department of Labor and Industry (DLI or the Department) propose to revise the Minnesota Electrical Code, which is found in Chapter 1315 of *Minnesota Rules*. The Minnesota Electrical Code is part of the Minnesota State Building Code. See Minnesota Rules, part 1300.0050 (J) (2016). The Department's regulatory purpose is to update the Minnesota Electrical Code to incorporate by reference the most current edition of the National Electrical Code (NEC). Specifically, the Board proposes to incorporate the 2020 NEC, which was developed and published by the National Fire Protection Association, Inc. (NFPA) and approved by the American National Standards Institute (ANSI).¹

The rulemaking hearing and this Report are part of a larger rulemaking process under the Minnesota Administrative Procedure Act.² The Minnesota Legislature has designed this process to ensure that state agencies have met all of the requirements that the state has specified for adopting rules.

The hearing was conducted to permit agency representatives and the Administrative Law Judge to hear public comment regarding the impact of the proposed rules and what changes might be appropriate. Further, the hearing process provides the general public an opportunity to review, discuss and critique the proposed rules.

The agency must establish that the proposed rules are within the agency's statutory authority; that the rules are needed and reasonable; and that any modifications that the agency made after the proposed rules were initially published in the State Register are within the scope of the matter that was originally announced.³

¹ See Exhibit (Ex.) D.at 1 (Statement of Need and Reasonableness, March 9, 2020).

² See Minn. Stat. §§ 14.131-.20 (2020).

³ Minn. Stat. §§ 14.05, .131, .23, .25 (2020).

Approximately 100 people attended the hearing as recorded by the Webex usage report.⁴ The proceedings continued until all interested persons, groups or associations had an opportunity to be heard concerning the proposed rules. 16 members of the public made statements or asked questions during the hearing.⁵

The agency panel at the public hearing included Jeffrey Lebowski (Counsel, Construction Codes and Licensing Division), Daniel Westberg (Chair of the Minnesota Board of Electricity), Dean Hunter (Chief of Electrical Inspections for DLI), and John Williamson (Commissioner of Labor and Industries board representative).⁶

After the close of the hearing, the Administrative Law Judge kept the rulemaking record open for another 20 calendar days—until Tuesday, September 8, 2020—to permit interested persons and the Board to submit written comments. Following the initial comment period, the hearing record was open an additional five business days to permit interested parties and the Agency an opportunity to reply to earlier-submitted comments.⁷ The hearing record closed on Monday, September 14, 2020.

SUMMARY OF CONCLUSIONS

The Department has established that it has the statutory authority to adopt the proposed rules, that it followed the required rulemaking procedures, and that the proposed rules are needed and reasonable.

Based upon all the testimony, exhibits, and written comments, the Administrative Law Judge makes the following:

FINDINGS OF FACT

I. Background to the Proposed Rules

A. Regulatory Background

1. Minnesota Statutes, sections 326B.31 to 326B.399 are known as the Minnesota Electrical Act.⁸

2. The Minnesota Statutes, section 326B.35 of the Minnesota Electrical Act mandates that all electrical wiring, apparatus and equipment for electrical light, heat and power, technology circuits or systems comply with the rules of the Department and the Board and be installed in conformity with accepted standards of construction for safety to life and property. The safety standards specifically identified are the most recently

⁴ Webex usage report, on file with the Office of Administrative Hearings (OAH).

⁵ HEARING TRANSCRIPT (Tr.) at 3.

⁶ Ex. 1.

⁷ See Minn. Stat. § 14.15, subd. 1.

⁸ Ex. D at 1; see Minn. Stat. § 326B.399 (2020).

published edition of the NEC as adopted by NFPA and approved by ANSI and the National Electrical Safety Code (NESC) as published by the Institute of Electrical and Electronics Engineers, Inc., and approved by the ANSI.⁹

3. The Board's statutory rulemaking authority to adopt the NEC is set forth in Minnesota Statutes, section 326B.32, subd. 2 (2020):

Subd. 2. **Powers; duties; administrative support.** (a) The board shall have the power to:

- (1) elect its chair, vice-chair, and secretary;
- (2) (2) adopt bylaws that specify the duties of its officers, the meeting dates of the board, and containing other provisions as may be useful and necessary for the efficient conduct of the business of the board;
- (3) (3) *adopt the Minnesota Electrical Code, which must be the most current edition of the National Electrical Code and any amendments thereto.* The board shall adopt the most current edition of the National Electrical Code and any amendments thereto pursuant to chapter 14 and as provided in subdivision 6, paragraphs (b) and (c)¹⁰

B. Overview of Issues

4. The Board proposes to adopt amendments to the Minnesota Electrical Code, Minnesota Rules, chapter 1315, which is part of the Minnesota State Building Code. The proposed amendments incorporate by reference the most current edition of the 2020 NEC, which was developed and published by the NFPA and approved by the ANSI.¹¹

5. The Board explained that Minnesota Statutes, sections 326B.31 to 326B.399 are known as the Minnesota Electrical Act (Act), and that section 326B.35 of the Act mandates that all electrical wiring, apparatus, and equipment for electrical light, heat and power, technology circuits, or systems be installed in conformity with accepted standards of construction for safety to life and property. The Board further explained that the safety standards specifically identified are the most recently published edition of the NEC as adopted by the NFPA and approved by ANSI and the NESC as published by the Institute of Electrical and Electronics Engineers, Inc. and approved by the ANSI.¹²

⁹ Ex. D at 000013.

¹⁰ Minn. Stat. 326B.32, subd. 2. (emphasis added).

¹¹ *Id.*

¹² *Id.*

6. The Board also explained that the changes to the NEC are made at national code hearings conducted by NFPA. The NEC is written by those who use the code book and utilize ANSI processes to provide maximum input from those who use and are impacted by the code. The Board described the extensive process of consideration, revision, public input, and review used to revise the NEC.¹³

7. Housing First Minnesota (HFM), a 1,100-member organization representing home builders, and other commenters objected to the Board's unamended adoption of the NEC. These objections focused on two broad areas: (1) technical issues with the provisions of the proposal, and (2) and the process used both nationally and in Minnesota to promulgate new standards.¹⁴

8. HFM stated that its concerns about process at the national level concern "regulatory marketing" which it describes as product manufacturers participating in and influencing the regulatory process in order to make the use of their products mandatory through regulations thus benefiting them through increased sales. HFM stated that its concerns at the Minnesota level are rooted in the fact that most rulemaking bodies housed under the Department amend and produce the various model codes, but the Board does not. HFM raised point-by-point concerns regarding process and the substance of the rules. These are addressed below.¹⁵

9. HFM reiterated and expanded upon on its prehearing written comments about increased costs to consumers at the public hearing.¹⁶ Also at the public hearing HFM raised new issues about the Board's rulemaking process. HFM argued that the Board failed to meet its burden of providing an adequate and informative SONAR and it failed to consider the additional costs that the adoption of the NEC will have on the affordable housing market.¹⁷

10. HFM argued that the Board's adoption of the NEC without amendment is anomalous when compared with other Boards and other parts of the building code. It also asserted that residential electrical costs will likely increase by at least 10 percent if the NEC is adopted without amendment. HFM raised nine sections of the NEC that it urged be revised, stricken, or maintained as found in the last iteration of the NEC. These points are addressed more fully below in Section V, the rule-by-rule analysis.¹⁸

11. The majority of commenters supporting HFM's positions, who were also members of HFM and the building industry, submitted generally identical letters listing the nine NEC sections delineated in HFM's comments of April 13, 2020.¹⁹

¹³ *Id.*

¹⁴ Ex. I at 000202.

¹⁵ *Id.* at 000204-000205; Tr. at 83-89 (Comments of Nick Erickson of HFM).

¹⁶ Tr. at 77-79.

¹⁷ *Id.* at 79.

¹⁸ Ex. I at 000201-000235; Tr. at 79-83 (Comments of Tony Wiener, home builder).

¹⁹ Ex. I at 000207-000235.

12. HFM testified that it took issue with the Board's SONAR related to Factors 1, 3, 4, 5, and 6. HFM testified about its issues point by point and more generally took issue with the Board's alleged lack of detail in its analysis as provided in the SONAR. HFM especially criticized the Board's cost analysis in the SONAR. HFM argued that "when an agency makes an important decision without written findings and reasons, it will not be allowed to rationalize its actions later. Rather, the agency's decision is reviewed under the substantial evidence standard to determine whether the agency has adequately explained how it derived its conclusion and whether the conclusion is reasonable on the basis of the record." HFM maintains that the Board's analysis is unreasonable because, it contends, there is no record.²⁰ HFM's issues with these factors are addressed fully below in Section IV delineating critiques of the Board's Minn. Stat. §14.131 analysis.

13. A wide variety of organizations and individuals support the Board's adoption of the NEC without amendments. These include representatives of fire prevention, protection, fighting, and code-writing organizations such as the Fire Marshal's Association of Minnesota, National Fire Protection Association, Underwriter Laboratories, and International Association of Electrical Inspectors; electrical industry groups, unions, and educational institutions, such as the Electrical Association, National Electrical Contractors Association, National Electrical Manufacturers Association, International Brotherhood of Electrical Workers, American Circuit Breaker Manufacturers Association, National Electrical Manufacturers Association, and Minneapolis Electrical JATC; and electrical component manufacturing companies such as Square D/Schneider Electric, Siemens, and Eaton. Furthermore, several individuals in the electrical trades and in government, including electrical inspectors with the cities of Bloomington and St. Paul, are in favor of adoption without amendment. Fire prevention experts such as the Minneapolis Fire Marshal are also in support of adoption without amendment, as are medical professionals and burn victim advocates with Regions Hospital Burn Center and the Phoenix Society for Burn Survivors.²¹

II. Procedural Requirements of Chapter 14

A. Agency Presentation at Hearing

14. The Board placed the documents described beneath findings of fact 15 into the hearing record as required by Minn. R. 1400.2220, subp. 1 A-K (2019).

15. On April 22, 2019, the Board published in the State Register a Request for Comments seeking comments on possible amendments to the rules governing the Minnesota Electrical Code. The Request for Comments informed that "the Board is considering rule amendments that adopt the *2020 National Electrical Code*."²² As stated above, the Board placed the following into the record:

²⁰ Tr. at 90-97 (Comments of Courtney Ernston, Mn. Construction Law Services and HFM).

²¹ Board's Preliminary Response to Comments at 25-26 (Sept. 8, 2020).

²² Ex. A (Request for Comments, April 22, 2019) at 000002-08.

- A copy of the proposed rule, dated January 21, 2020, along with the Revisor’s approval for publication in the State Register;²³
- The Statement of Need and Reasonableness (SONAR);²⁴
- A Certificate of emailing the SONAR to the Legislative Reference Library as directed by Minn. Stat. §§ 14.131 and 14.23;²⁵
- The Dual Notice as mailed and published in the State Register on March 16, 2020;²⁶
- The Notice of Rescheduled Hearing as mailed and published in the State Register on April 20, 2020;²⁷
- The Notice of Revised Format of Hearing as mailed and published in the State Register on July 13, 2020;²⁸
- Certificates of accuracy: of the mailing list for the mailing of the Dual Notice to the rulemaking list; of mailing the Dual Notice to the rulemaking list; of the electronic rulemaking email list and of emailing the Dual Notice to the electronic rulemaking email list; of the mailing list and of mailing of the Notice of Rescheduled Hearing to the rulemaking list; of the electronic rulemaking email list and of emailing the Notice of Rescheduled Hearing to the electronic email list; of the mailing list and of mailing the Notice of Revised Format of Hearing to the rulemaking list; and of the electronic rulemaking email list and of emailing the Notice of Revised Format of Hearing to the electronic rulemaking email list;²⁹
- A March 16, 2020, email sending a link to the Dual Notice; certificate of emailing the Dual Notice to the persons and associations identified in the additional notice plan; certificate of emailing the Notice of Rescheduled Hearing to the persons and associations identified in the additional notice plan; certificate of emailing the Notice of Revised Format of Hearing to the persons and associations identified in the additional notice plan;³⁰
- Timely comments and requests for hearing on the proposed rule were received by the Board during the comment period;³¹

²³ Ex. C (Proposed Rule and Revisor’s Approval, Jan. 21, 2020) at 000010-11.

²⁴ Ex. D (SONAR, March 9, 2020) at 000013-000025.

²⁵ Ex. E (Certificate of e-mailing, March 12, 2020) at 000027-29.

²⁶ Ex. F (Dual Notice and Notice in State Register, March 16, 2020) at 000031-41.

²⁷ Ex. F.1 (Notice and Notice in State Register, April 20, 2020) at 000043-48.

²⁸ Ex. F.2 (Notice, July 13, 2020) at 000050-000057.

²⁹ Exs. G through G.6 (Certificates, various dates) at 000059-18.

³⁰ Exs. H through H-2 (Certificates and accompanying material, various dates) at 000144-000168.

³¹ Ex. I (Various comments and dates) at 000170-000235.

- Certificates of sending, to legislators and the legislative coordinating commission, the: Dual Notice and SONAR; Notice of Rescheduled Hearing; and Notice of Revised Hearing format;³²
- Certificates of emailing, to those who requested a hearing via email, the: Notice of Hearing; and Notice of Revised Format of Hearing;³³
- Letter to Minnesota Management and Budget dated January 14, 2020, and the Minnesota Management and Budget responsive memorandum dated January 27, 2020;³⁴
- Letter to the Commissioner of the Minnesota Department of Agriculture to comply with Minn. Stat. § 14.111, regarding farming operations;³⁵
- Board of Electricity meeting minutes of the January 8, 2019, meeting directing the Board Chair to initiate rulemaking proceedings to begin adoption of the 2020 NEC;³⁶
- Board of Electricity meeting minutes of the October 8, 2019, meeting affirming the NEC Adoption Rules Subcommittee's recommendations to adopt the 2020 NEC without Minnesota-specific amendments and providing the Board Chair with authorization to publish Notice of Intent to Adopt the 2020 NEC in chapter 1315 without specific Minnesota amendments;³⁷
- A Certificate of the Board of Electricity Authorizing Resolution, which certifies that the Board authorizes initiating the process of adopting the 2020 NEC;³⁸
- A Board of Electricity 2020 NEC Cost Analysis Spreadsheet;³⁹ and
- A National Association of Home Builders 2020 NEC Cost Report.⁴⁰

16. At the hearing on August 19, 2020, the Department filed copies of the documents required by Minn. R. 1400.2220.⁴¹

³² Exs. K through K-2 (Certificates, various dates) at 000238-52.

³³ Exs. K3 through K4 (Certificates, various dates) at 000254-64.

³⁴ Ex. K5 (Jan. 14 and 27, 2020 at 000266-67).

³⁵ Ex. K6 (Letter, Jan. 8, 2020) at 000269-000272.

³⁶ Ex. K7 (Board Minutes, Jan. 8, 2020) at 000274-76.

³⁷ Ex. K8 (Board Minutes, Oct. 8, 2020) at 000278-91.

³⁸ Ex. K9 (Certificate, Oct. 14, 2020) at 000293.

³⁹ Ex. K10 (Spreadsheet, Apr. 27, 2020) at 000295.

⁴⁰ Ex. K11 (Report, Dec. 2019) at 000297-338.

⁴¹ Compare Exs. A through K *with* Minn. R. 1400.2220, subp. 1 (2019).

B. Additional Notice Requirements

17. Minn. Stat. §§ 14.131 and 14.23 require that an agency include in its SONAR a description of its efforts to provide additional notification to persons or classes of persons who may be affected by the proposed rule; or alternatively, the agency must detail why these notification efforts were not made.

18. On March 16, 2020, the Department provided the Dual Notice in the following manner, according to the Additional Notice Plan approved by the Office of Administrative Hearings in a February 24, 2020 Order on Review of Additional Notice Plan and Dual Notice:

- The Board published the proposed rules, the Statement of Need and Reasonableness, and the Dual Notice on the Board's rulemaking docket on the Department of Labor and Industry's website.
- Notice of the rulemaking was sent by first class mail to the notice list the Department maintains pursuant to Minn. Stat. § 14.14.
- A copy of the Notice of Hearing was sent to a wide-ranging set of construction trade associations, fire safety organizations and local government officials, as detailed in its Additional Notice Plan.⁴²

C. Notice Practice

19. The Administrative Law Judge finds that the Department fulfilled its responsibilities, under Minn. R. 1400.2080, subp. 6 (2019), to mail the Notice of Hearing "at least 30 days before the start of the hearing" to potential stakeholders.⁴³

20. The Administrative Law Judge finds that the Department fulfilled its responsibilities to mail the Dual Notice "at least 30 days before the start of the hearing" to designated legislators.⁴⁴

21. The Administrative Law Judge concludes that the Department fulfilled its responsibilities as to mailing the Notice of the Hearing.⁴⁵

D. Impact on Farming Operations

22. Minn. Stat. § 14.111 (2020) imposes additional notice requirements when the proposed rules affect farming operations. The statute requires that an agency

⁴² Ex. H at 000144; Ex. E; Exs. F-1 through F-3.

⁴³ Ex. E; Exs. F-1 through F-3.

⁴⁴ See Minn. Stat. §§ 14.14 and 14.116 (2020); Ex. G.

⁴⁵ Minn. Stat. § 14.14.

provide a copy of any such changes to the Commissioner of Agriculture at least 30 days prior to publishing the proposed rules in the State Register.⁴⁶

23. The Board fulfilled its responsibilities under Minn. Stat. § 14.111 when it served the Notice of Adoption of the 2020, along with a letter of explanation, on the Commissioner of Agriculture on January 7, 2020.⁴⁷

24. The Board explained to the Commissioner of Agriculture that Article 547, § 547.5(G) of the 2020 NEC was revised by the NFPA. This revision eliminated ground-fault circuit-interrupter (GFCI) protection for receptacles rated above 125-volt, single phase, 20-ampere in areas of agricultural buildings that are included within the scope of Article 547. The Board explained that a change in the 2017 NEC that expanded GFCI protection for certain receptacles had unforeseen consequences. Specifically, it resulted in unintended tripping of GFCI protective devices in those building areas and created unintended financial hardship for farm building owners. Therefore, section 547.5(G) of the 2020 NEC was revised to eliminate GFCI protection requirements for these agricultural building receptacles.⁴⁸

E. Statutory Requirements for the SONAR

25. The Administrative Procedure Act obliges an agency adopting rules to address eight factors in its Statement of Need and Reasonableness (SONAR). Those factors are:

- (a) a description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule;
- (b) the probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues;
- (c) a determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule;
- (d) a description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule;

⁴⁶ Minn. Stat. § 14.111.

⁴⁷ Ex. K-6 (Letter, Jan. 7, 2020).

⁴⁸ Ex. K-6 at 000269.

- (e) the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals;
- (f) the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals;
- (g) an assessment of any differences between the proposed rule and existing federal regulations and a specific analysis of the need for and reasonableness of each difference; and
- (h) an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.⁴⁹

1. The Agency's Regulatory Analysis

(a) A description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule.

26. The Department asserts that those who will be affected by the proposed rule, who will bear the costs of the proposed rule, and who will benefit from the proposed rule include: building owners; equipment suppliers; contractors; and code enforcement authorities. Although provisions in the NEC have greater impact on electrical contractors, they also impact technology system contactors and general contractors.⁵⁰

(b) The probable costs to the Agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues.

27. The Board estimates that, because the Board only adopts the NEC and does not administer it, the Board will not incur any costs associated with the adoption of the 2020 NEC. The Department provides administrative support to the Board and administers and enforces rules adopted by the Board.⁵¹

⁴⁹ Minn. Stat. § 14.131.

⁵⁰ Ex. D at 000016.

⁵¹ *Id.*

28. The Board predicts that costs to the Department include the costs of purchasing code books for state employees who address electrical code questions, as well as the cost of revising license examinations to reflect the updated code. Adoption of an updated version of the NEC will not affect state revenues because the Department currently enforces the existing Minnesota Electrical Code using electrical licensing and permit fees set by statute that go into a dedicated fund to cover administrative and enforcement costs.⁵²

29. The Board does not predict that adoption or enforcement of the proposed rule will impact state revenues.⁵³

(c) The determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule.

30. The Board asserts that there are no less costly or intrusive methods for achieving the purpose of the proposed rule. The Board states that the NEC is recognized throughout the U.S. and many other countries as the prevailing model electrical code. Incorporating the 2020 NEC by reference is the least costly method for adopting a national model code and is in accordance with Minnesota Statutes, section 326B.32, subdivision 2 (a)(3) (2020), which directs that adoption.⁵⁴

31. The Board states that, historically the state of Minnesota has adopted the NEC by reference without any state amendments. The Board of Electricity is proposing adoption of the 2020 NEC without amendment in this rulemaking, consistent with past code adoptions. The Board maintains that, unlike other building codes that may need to be amended at the local level due to specific conditions, such as earthquakes, snow loads, wind loads, prevalence of hurricanes, extreme temperatures and so on, the NEC is universally applicable in all jurisdictions.⁵⁵

(d) A description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule.

32. The Board maintains that no other methods were considered for achieving the purpose of the proposed rule. The purpose of the rule is to establish the Minnesota Electrical Code consistent with statutory requirements. The NEC is the only electrical code that is accepted and in use throughout the United States. The Board believes that it is required by the Legislature to adopt the “most current edition of the National Electrical Code” in accordance with Minn. Stat. §326B.32, subd. 2 (a)(3).⁵⁶

⁵² *Id.*

⁵³ *Id.* at 000016.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ *Id.* at 000016-17.

(e) The probable costs of complying with the proposed rules.

33. The Board asserts that the probable costs of complying with the proposed rule are generally anticipated to be minimal because there is already a current electrical code in place in Minnesota that has adopted the 2017 version of the NEC. The Board does not anticipate that the differences between the 2017 NEC and the 2020 NEC will result in a significant change in costs for any stakeholders. According to the Board, the change in costs for any given project will vary from project to project because the type of work being done, the size of the project, and the condition of any existing electrical work may affect any cost differential between complying with the existing electrical code and the 2020 NEC.⁵⁷

34. Revisions, updates, and clarifications reflected in the 2020 NEC can result in lower costs in some instances or higher costs in others. Costs for any particular project may also remain the same under either the 2017 NEC or the 2020 NEC. Therefore, revisions, updates and clarifications reflected in the 2020 NEC may result in lower costs in some instances or higher costs in others.⁵⁸

35. The Board has identified five notable changes in the 2020 NEC related to dwellings that may result in increased costs for some new building projects: 1) expanded ground-fault circuit-interrupter requirements for basement areas and 240-volt receptacle outlets, such as electric ranges and electric dryers (see 2020 NEC, Article 210, section(A)); 2) expanded GFCI requirements for 240-volt outdoor circuits such as air-conditioning equipment (see *id.* at section 210.8 (F)); 3) additional receptacle outlets required for kitchen islands and kitchen peninsulas (see *id.* at section 210.52 (C)); 4) surge-protective devices required for service panelboards (see 2020 NEC, Article 230, section 230.67); and 5) outdoor emergency disconnects required for first responder emergency access (see *id.* at section 230.85). The Board asserts that the additional costs associated with these changes are generally limited to material costs and are not expected to exceed more than \$600 per new building project or new home in the event that all five changes are applicable to the same home or project.⁵⁹

36. The cost estimates discussed by the Board in the SONAR were arrived at by the Board's review of the 2020 NEC adoption process at the national level, including a report entitled "Estimated Costs of the 2014, 2017, and 2020 NEC Code Changes for Single-Family and Multifamily Buildings" that was prepared by Home Innovation Research Labs for the National Association of Home Builders (NAHB)—a link to which was provided in the SONAR and was an exhibit at the public hearing.⁶⁰

⁵⁷ *Id.* at 000017.

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.*; Ex. K11 (Report, Dec. 2019) at 000297-338.

37. The Board also considered surveys of various Minnesota-licensed electrical contractors and Department staff. The Board found that neither labor nor material cost estimates varied significantly from contractor to contractor or between Department staff members, all of whom emphasized that the reported values were merely estimates, and that those estimates could vary depending on factors such as the type of work being done, the size of the project, the condition of any existing electrical work, and other factors. For example, a new home may be built with all gas appliances and contain no kitchen islands or peninsulas. In such a case, because no expanded GFCI requirements for 240-volt receptacles or kitchen islands/peninsulas would be necessary for this structure under the 2020 NEC, the cost increase for materials and labor would be less than the estimated \$600 increase mentioned above.⁶¹

38. The Board notes a change in the 2020 NEC related to agricultural buildings that will result in decreased costs for some farm and agricultural building owners. Specifically, the 2020 NEC was revised to eliminate existing GFCI protection requirements for receptacles rated above 125-volt, single phase, 20-ampere in areas of agricultural buildings that are included within the scope of Article 547. These areas include, equipotential plane, dirt confinement areas, wet and damp locations, and the outdoors (see 2020 NEC, Article 547, section 547.5(G)). The Board expects this revision to result in cost savings for both material and labor expenses.⁶²

(f) The probable costs or consequences of not adopting the proposed rule, including those costs borne by individual categories of affected parties, such as separate classes of governmental units, businesses, or individuals.

39. The Department asserts that, if the new edition of the NEC is not adopted, the State would continue to rely on the 2017 NEC. In the Board's view, this would cause the industry in Minnesota to use an electrical code that does not incorporate all the latest methods and technologies and would therefore fall behind in electrical standards to the detriment of all stakeholders. The Board contends, the failure to adopt the proposed rule would also have a negative effect on electrical licensing reciprocity with other states. Minnesota has electrical licensing reciprocity agreements with Alaska, Arkansas, Colorado, Iowa, Montana, Nebraska, North Dakota, South Dakota and Wyoming, all of which are in the process of reviewing and adopting the 2020 NEC as well.⁶³

40. The Board also argues that failure to adopt the proposed rule could be considered a statutory violation, because Minn. Stat. § 326B.32, subd. 2(a)(3) requires the incorporation of the most recently published edition of the NEC into Minnesota's electrical code.⁶⁴

⁶¹ Ex. D at 00017.

⁶² *Id.* at 000017-18.

⁶³ *Id.* at 000018.

⁶⁴ *Id.*

41. The Board notes that affected parties—including contractors, inspection departments, and designers—would need to purchase copies of the 2020 NEC. Training curriculum would also need to be updated to incorporate any new or changed provisions in the code. The Board notes, however, that continuing education is a requirement for all licensed electricians in Minnesota, so training is necessary regardless of which code version is adopted. The Board asserts that training providers will incur minimal expenses, including purchasing of the 2020 NEC code book and updating their existing training materials.⁶⁵

(g) An assessment of any differences between the proposed rules and existing federal regulation and a specific analysis of the need for and reasonableness of each difference.

42. In the SONAR, the Board states that there are no applicable federal regulations that address electrical code issues in the construction of non-federally-owned buildings.⁶⁶

(h) An assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule.

43. In the SONAR, the Board observes that there are no applicable federal regulations that address electrical code issues in the construction of non-federally owned buildings, so there is no federal impact or cumulative effect. There are no other state regulations related to the specific purpose of this rule.⁶⁷

2. Performance-Based Regulation

44. The Administrative Procedure Act requires an agency to describe how it has considered and implemented the legislative policy supporting performance based regulatory systems. A performance-based rule is one that emphasizes superior achievement in meeting the agency’s regulatory objectives and maximum flexibility for the regulated party and the agency in meeting those goals.⁶⁸

45. To address this requirement, the Board states that Minn. Stat. § 326B.106 (2020) provides authority to adopt a state building code that conforms, insofar as practicable, to national model codes, and also requires that the code be “adopted in terms of desired results instead of the means for achieving those results, avoiding wherever possible the incorporation of specifications of particular methods or materials.” The Board asserts that the 2020 edition of the NEC implements performance-based

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

standards to the extent practicable.⁶⁹

46. The Administrative Law Judge concludes that the rule development process implemented the policies set forth in Minn. Stat. § 14.002 (2020), while balancing its general emphasis on costs and flexibility with the more specific requirements of: (1) Minn. Stat. 326B.32, subd. 2(a)(3), which requires the Board to adopt the most current edition of the NEC and any amendments the Board finds necessary; and (2) section 326B.35 (2020), which governs safety standards under the Minnesota Electrical Act and prioritizes accepted standards of construction for safety to life and property and directs that using the most current national safety standards is prima facie evidence of accepted standards of construction for safety to life and property;⁷⁰ and (3) section 326B.106, which emphasizes and authorizes building codes to conform insofar as practicable to model building codes generally accepted and in use throughout the U.S.⁷¹

3. Consultation with the Commissioner of Minnesota Management and Budget (MMB)

47. As required by Minn. Stat. § 14.131, the Commissioner of Minnesota Management and Budget (MMB) evaluated the fiscal impact of the proposed rules on local units of government. In a Memorandum dated January 27, 2020, MMB concluded that:

The adoption of the 2020 version of the National Electrical Code is not anticipated to have a substantial cost to local units of government. Local governments may incur costs associated with purchasing new code books (\$110 per person maximum) and any educational expenses (\$170 per person maximum) necessary for the training of enforcement officials. The department's findings regarding the fiscal impact of this proposal to local governments are sound and agreed to.⁷²

III. Critiques of the Board's Minn. Stat. § 14.131 Analysis

A. General Criticisms

48. As a preliminary matter, some Commenters suggest that they believe that the sufficiency of the Board's SONAR cannot be supplemented by additional evidence developed for the hearing record.⁷³ This is too narrow an interpretation of the rulemaking proceeding. The rulemaking process allows the Board to rely not just on its SONAR, but at the public hearing on "an affirmative presentation of the facts

⁶⁹ *Id.*

⁷⁰ Minn. Stat. § 326B.35 allows political subdivisions to make and enforce requirements more stringent than these safety standards, but not less stringent.

⁷¹ Minn. Stat. § 326B.35.

⁷² Ex. K-5 at 000267.

⁷³ See, e.g., Tr. at 91-97.

establishing the need for and reasonableness of the proposed rule and fulfilling any relevant substantive or procedural requirements imposed on the agency by law or rule.” Additionally, “the agency may, in addition to its affirmative presentation, rely upon facts presented by others on the record during the rule proceeding to support the rule adopted.” Moreover, agency representative or witnesses “may present written and oral evidence . . . in order to explain the purpose or intended operation of a proposed rule . . .”⁷⁴ Likewise, calculations on the costs of compliance must be made by an agency before the close of the hearing record.⁷⁵ That the process provides for supplemental responses fits well within the rulemaking process which is designed to allow an agency to modify rules during the process as long as the change falls within the scope of the matter announced in the notice.⁷⁶

49. At the public hearing, HFM criticized the Board’s process for developing the rule as rushed and the outcome as predetermined.⁷⁷ The organization further argued that the process was a “rubber stamping” as compared to other code changes, which it characterized as conducting rigorous studies, provide ample data and greater explanation.⁷⁸ Housing First also alleged that building and electrical contractors were unwilling to participate in criticizing the rules.⁷⁹ HFM accuses the Board of acting “arbitrarily and capriciously.”⁸⁰

50. The Board responded that the process was not rushed, flawed, predetermined, or exclusionary. The Board contends that, contrary to the Commenters’ assertions, the Board’s rule development process began on August 23, 2016, when the NFPA published the 2017 NEC and opened the Public Input Stage for the 2020 NEC. At that time, pursuant to its statutory mandate to adopt the most recent NEC, the Department tasked Department employees and Board representatives Dean Hunter and John Williamson with following and participating in the NFPA development of the 2020 NEC on behalf of the Department and the Board.⁸¹

51. According to the Board, once the NFPA began working on its second draft of the 2020 NEC for public comment, the Board was made aware of its progress and voted to begin initiating Minnesota’s formal rulemaking process under the Administrative Procedures Act. On August 05, 2019, the NFPA finalized electronic publication of the 2020 NEC and published a hardcopy edition on August 25, 2019. On September 12, 2019, the Board’s 2020 NEC Adoption Review Subcommittee met to discuss the

⁷⁴ Minn. Stat. § 14.14, subs. 2 and 2a.; see *Manufactured Housing Institute v. Pettersen*, 347 N.W.2d 238, 240 (Minn. 1984); *Minnesota Chamber of Commerce v. Minnesota Pollution Control Agency*, 469 N.W.2d 100, 103 (Minn. Ct. App. 1991).

⁷⁵ Minn. Stat. § 14.127, subd. 2.

⁷⁶ Minn. Stat. § 14.05, subd. 2.

⁷⁷ See Tr. at 77-95.

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ Tr. at 90.

⁸¹ Board’s Preliminary Response to Comments at 5 (Sept. 8, 2020).

specific changes to the 2020 NEC and to determine whether to accept those changes or amend the Code for Minnesota use.⁸²

52. The Board states that Department and Board staffer Dean Hunter provided the subcommittee with a list of 53 separate changes made to the 2017 NEC and a detailed analysis of the most significant of those changes, including the changes that are being contested by the Commenters to this rule proceeding. After discussing those changes, the subcommittee adjourned to further consider the changes. The subcommittee met again on October 8, 2019, to continue the discussion and agree on a recommendation to the full board. After more discussion, the subcommittee voted unanimously to recommend to the full board that the 2020 NEC be adopted without Minnesota amendments. After hearing the subcommittee's report and recommendation, the Board voted to adopt the 2020 NEC without any Minnesota specific amendments.⁸³

53. The Board disputes the characterization of its process as “rubber stamping.” Rather, the Board believes that it complied with all procedural and notice requirements, and that it reasonably relied upon and thoroughly analyzed the outcome of the rigorous analysis and public debate that occurred at the national level during the development of the most recent version of the NEC.⁸⁴

54. The Board also explained that, unlike other parts of the building code that are impacted by a region's particular terrain, geological underpinnings, and weather, among other factors, electrical safety is little impacted by those considerations.⁸⁵ As demonstrated by the record in this matter, no evidence was presented to show that methods for preventing the electrocution of installers and end users of electricity significantly differ from state to state. In the same way, the methods for preventing fires from electricity may differ slightly but not significantly based on choices made in other sections of the building code. This is one reason why the Board believes its decision to enact the NEC without amendment may be viewed as warranted, practical, efficient, and cautious rather than rushed and predetermined. The record demonstrates that the NEC does not trend only towards greater precautions and concomitant costs but will, as occurred in the 2020 iteration with the GFCI requirement for certain agricultural receptacles, remove requirements determined to be more burdensome than useful.⁸⁶

55. The Administrative Law Judge finds that the Board's rulemaking process in considering the 2020 NEC—including its consideration of changes from the 2017 NEC and whether Minnesota-specific amendments were warranted—complied with procedural and notice requirements, was thorough and well-reasoned, and was not arbitrary or capricious.

⁸² *Id.* at 3.

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ Ex. D at 00016.

⁸⁶ Ex. K6 at 000269.

B. Regulatory Analysis Factor 1: Classes of Affected Persons

56. Some Commenters argued that the Board’s analysis of “the classes of persons who will probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule”⁸⁷ was insufficient. These Commenters assert that the SONAR did not make clear that homeowners will bear the increased costs.⁸⁸

57. The SONAR’s statement about this factor is that “those who will be affected by the proposed rule, who will bear the costs of the proposed rule, and who will benefit from the proposed rule include: Building owners; equipment suppliers; contractors; and code enforcement authorities. Although provisions in the NEC have greater impact on electrical contractors, they also impact technology system contactors and general contractors.”⁸⁹

58. In response to the criticism of its analysis, the Board responds that it agrees that the homeowner would both bear the costs of the proposed rule and benefit by the increased safety and technological advances provided by the 2020 NEC. The Board points out that it did identify “building owners” in the SONAR as a group who would bear the costs and benefits of the proposed rule, and says that the term “building owners” is clearly synonymous with “Homeowners.” The Board says it did not mean to confuse or otherwise mislead the Commenters as to who would bear the costs and the benefits of the proposed rule. Additionally, the Board said that it fails to see how the Commenters were prejudiced by the Board’s allegedly deficient response to this inquiry.⁹⁰

59. Reasonable parties may disagree about whether a term such as “building owners” is more accurate, because it is more inclusive, or less accurate because it is slightly less common. Nonetheless, the term includes homeowners, the class of people who the Commenters argue bear all the costs. The Administrative Law Judge agrees that the term “building owners” includes homeowners. Additionally, the term may reasonably be viewed as more accurate and inclusive than the term homeowners because, while all homeowners are building owners, not all building owners are homeowners. The term chosen by the Board includes homeowners and also extends to owners of other types of properties and builders who own buildings prior to sale. The Board’s description also leaves room for the possibility that contractors and others will

⁸⁷ Minn. Stat. § 14.131(1).

⁸⁸ See Tr. at 92; see also Tr. at 78 (*D. Siegel*: “The code review process exists to protect homeowners who are required to incorporate these mandates and pay these costs.”); Tr. at 81 (*T. Wiener*: “The rulemaking process focuses on the cost to a builder, but these costs, like all regulatory and material costs, are always passed to and paid by the home buyer.”); Tr. at 88-89 (*N. Erickson*: “And I do want to stress that our cost analysis does show that there’s roughly a \$1,000 cost increase to the home buyer.”); Tr. at 94 (*C. Ernston*: “The Board also does not discuss who will bear the cost of compliance. The answer is Minnesota home buyers and property owners.”).

⁸⁹ Ex. D at 000016.

⁹⁰ Board’s Preliminary Response to Comments at 5 (Sept. 8, 2020).

incur some of the increased costs by either absorbing some amount or by incurring higher inventory costs, albeit temporary. The description also makes clear that, while the intended safety benefit accrues to building owners, there is some benefit to, for example, contractors and code enforcement authorities.

60. In the view of the Administrative Law Judge, the Board's choice of terms was reasonable because it includes dwellings that are not owned by the occupant and even ones that are not yet occupied. Even if arguably there were better choices, the SONAR's analysis and description of which parties will bear the cost of the rule changes was reasonable and served to provide notice to potentially affected persons.

C. Regulatory Analysis Factor 2: Probable Cost to Agencies

61. No critiques from Commenters were received concerning Factor 2. The Administrative Law Judge finds that the Board adequately addressed Factor 2 in its SONAR.

D. Regulatory Analysis Factor 3: Cost and Intrusiveness

62. Some Commenters argue that the Board's "determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule"⁹¹ was deficient.⁹²

63. These Commenters state that the Board's response to Factor 3 is deficient because the Board concludes that there are no less costly or intrusive methods available for achieving the purpose of the proposed rule that adopts and incorporates by reference the National Electrical Code.⁹³ The Commenters argue that the SONAR contains no examination or description of why or how the board came to its conclusion. The Commenters further allege that the Board's response is indicative of the Board's desire to express its will rather than its reasoned judgment.⁹⁴

64. In the SONAR, the Board determined that there are no less costly or intrusive methods for achieving the purpose of the proposed rule, and that incorporating the 2020 NEC by reference is the least costly method for adopting a national model code.⁹⁵

65. In response to the Commenters' criticism of the Board's analysis under this section, the Board states that the Minnesota legislature has mandated that the Board specifically adopt the most current version of the National Electrical Code

⁹¹ Minn. Stat. § 14.131(3).

⁹² Tr. at 92-93 (C. *Ernst*on "The board simply states that there are no less costly or intrusive methods...There is no examination or description of why or how the board came to that conclusion. Such a finding expressing the agency's will rather than its judgement should be found arbitrary and capricious . . .").

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ Ex. D at 000016.

available. The Board says that, unlike the Minnesota Plumbing Board or the Department of Labor and Industry, which are given the discretion as to which model code to review for adoption and incorporation, the legislature did not give the Board of Electricity the discretion to choose between available model codes or create its own “homegrown” electrical code. The Board references Minn. Stat. §§ 326B.435, subd. 2 (a)(3) (Plumbing Board) and 326B.106, subd. 1 (Department of Labor and Industry).⁹⁶

66. The Board further argues that it is required to adopt the most recent version of the National Electrical Code to ensure safety and provide a uniform set of electrical regulations. The Board determined in the SONAR, and reiterates in its responsive comments, that there are no less costly or intrusive methods available to achieve the purpose of the proposed rule because the legislature has mandated that the most current version of the NEC be adopted for use in Minnesota. Given this statutory mandate, the Board disagrees with the Commenters’ argument that the Board’s response to Regulatory Analysis Factor 3 in the SONAR is an example of the Board exercising its will over its judgment. Additionally, while the Board does not agree that its response to this requirement is deficient, it does not understand how the Commenters were prejudiced by the Board’s allegedly deficient response to this inquiry.⁹⁷

67. Minn. Stat. § 326B.32, subd. 2, compels the Board to adopt “the most current edition of the [NEC] and any amendments thereto.” The adoption of amendments is controlled by Minn. Stat. § 326B.32, subd. 6(b)-(e), which states that amendments receiving an affirmative two-thirds or more majority vote of voting Board members shall be included in the next code rulemaking proceeding initiated by the Board. Furthermore, during an active code rulemaking procedure, subdivision 6(c) permits the Board to reconsider code amendments that previously failed to receive a two-thirds majority vote, but “only if new or updated information that affects the electrical code amendment is presented to the board.” Thus, although the statute requires the Board to adopt the NEC and no other code, it does permit the Board to consider and adopt amendments to the NEC. During this rulemaking procedure, the Board, in its discretion, chose not to adopt any amendments. The procedure for allowing reconsideration of amendments during an open rulemaking procedure would permit the Board to reconsider amendments within the scope of the subjects of the rulemaking notice, of its own accord, or on an administrative law judge’s recommendation, and vote in their favor if commenters brought to light new or updated information affecting those amendments.

68. The Administrative Law Judge finds that the Board’s rulemaking process resulting in the adoption in full of the most recent NEC does not constitute an exercise of the Board’s will over its judgment. The record demonstrates that the Board appropriately considered whether the adoption in full of the NEC was the least costly measure for adopting the that code. Although the statute permits the Board to adopt amendments to the NEC, the Board has explained that adopting Minnesota-specific amendments would not ensure safety and provide a uniform set of electrical regulations.

⁹⁶ Board’s Preliminary Response to Comments at 5 (Sept. 8, 2020).

⁹⁷ *Id.*

Thus, the record supports the Board's finding that no amendments to the NEC are appropriate in this proceeding.

E. Regulatory Analysis Factor 4: Alternative Methods for Achieving the Same Purpose

69. Commenters argue, on generally the same grounds as for Factor 3, that the Board's analysis as to Factor 4 is deficient and an example of the Board's exercising its "will rather than its judgement." The Commenters find that the Board put forth "ample information" at the hearing but not in this portion of the SONAR and simply states that no alternative methods were considered.⁹⁸

70. The Board responds to the Commenters' criticism of its analysis under Factor 4, that given the Board's statutory mandate, the Board disagrees with the Commenters' argument that the Board's response to Regulatory Analysis Factor 4 in the SONAR is deficient.⁹⁹

71. For the reasons given above for Factor 3, the Administrative Law Judge finds that the record supports the Board's finding that no amendments to the NEC are appropriate in this proceeding.

F. Regulatory Analysis Factor 5: Costs of Compliance

72. Regulatory Factor 5 requires the Board to address the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals.¹⁰⁰

73. The Commenters assert that the Board fails to identify who will bear the costs of compliance with the proposed rule and that the amount cited (\$600) differs from that cited by the National Association of Home Builders (NAHB) (\$792) and that testified to by John Williamson at the hearing (\$450).¹⁰¹

74. In the SONAR the Board provided an extensive explanation of the method used to arrive at its compliance cost estimates while noting that costs will vary from project to project.¹⁰² The Board also noted that under both the 2017 NEC and 2020 NEC, particular projects could have the same costs, lower costs or higher costs depending upon which code provisions are applied. Compliance costs are not linear in one direction.¹⁰³

⁹⁸ Tr. at 93.

⁹⁹ Board's Preliminary Response to Comments at 6 (Sept. 8, 2020).

¹⁰⁰ Minn. Stat. § 14.131(6).

¹⁰¹ Tr. at 93-94.

¹⁰² Ex. D. at 000017.

¹⁰³ *Id.*

75. Additionally in the SONAR, the Board identified five notable changes in the 2020 NEC related to dwellings which may result in increased costs for some new building projects, including:¹⁰⁴ 1) expanded GFCI requirements for basement areas and 240-volt receptacle outlets such as electric ranges and electric dryers (See 2020 NEC, Article 210, section(A)); 2) expanded GFCI requirements for 240-volt outdoor circuits such as air- conditioning equipment (See *id.* at section 210.8 (F)); 3) additional receptacle outlets required for kitchen islands and kitchen peninsulas (See *id.* at section 210.52 (C)); 4) surge-protective devices required for service panelboards (See 2020 NEC, Article 230, section 230.67); and 5) outdoor emergency disconnects required for first responders' emergency access (See *id.* at section 230.85). Importantly, the additional costs associated with these changes are generally limited to material costs and are not expected to exceed more than \$600 per new building project or new home in the event that all five changes are applicable to the same.¹⁰⁵ These are addressed further below in the section of this report titled "rule by rule analysis."

76. The Board provided detailed information about its method for arriving at its cost estimations. The estimates were arrived at by the Board's review of the 2020 NEC adoption process at the national level, including a report entitled "Estimated Costs of the 2014, 2017, and 2020 NEC Code Changes for Single-Family and Multifamily Buildings" that was prepared by Home Innovation Research Labs for the National Association of Home Builders (NAHB) and to which the Board provided as a link in the SONAR and an exhibit at the hearing. The Board also explained that it relied upon surveys of various Minnesota licensed electrical contractors and Department staff and found that neither labor nor material cost estimates varied significantly from contractor to contractor or between department staff members, all of whom emphasized that the reported values were merely estimates and that those estimates could vary depending on factors such as the type of work being done, the size of the project, the condition of any existing electrical work, and other factors. As an example the Board considered that a new home may be built with all gas appliances and contain no kitchen islands or peninsulas; because no expanded GFCI requirements for 240-volt receptacles or kitchen islands/peninsulas are necessary for this structure under the 2020 NEC, the cost increase for materials and labor would be less than the estimated \$600 increase.¹⁰⁶

77. The Board acknowledged that affected parties include contractors, inspection departments and designers, who will need to purchase copies of the 2020 NEC. Training curriculum will also need to be updated to incorporate any new or changed provisions in the code. However, it should be noted that continuing education is a requirement for all licensed electricians in Minnesota, so training is necessary regardless of which code version is adopted. Finally, training providers will incur minimal expenses including purchasing of the 2020 NEC code book and updating their existing training materials.¹⁰⁷

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Id.* at 000017 at fn 6.

¹⁰⁷ Ex. D at 000023.

78. The Board also noted the change in the 2020 NEC related to agricultural buildings which will result in decreased costs for some farm and agricultural building owners. Specifically, the 2020 NEC was revised to eliminate existing GFCI protection requirements for receptacles rated above 125-volt, single phase, 20-ampere in areas of agricultural buildings that are included within the scope of Article 547, such as areas of equipotential plane, dirt confinement areas, wet and damp locations, and the outdoors (See 2020 NEC, Article 547, section 547.5(G)). This revision is expected to result in cost savings for both material and labor expenses.¹⁰⁸

79. In its responsive comments the Board noted, in addition to the detail provided in the SONAR, that the difference between the NAHB cost estimate of \$792 and the Board's \$600 determination can be explained by subtracting the almost \$200 in added profit and overhead that the NAHB study included in its cost estimate.¹⁰⁹ The Board also explained that these estimates can change rapidly over time depending upon material and labor cost fluctuations, home design specifics, product choice, and other factors.¹¹⁰ Indeed, the Board explained that its \$450 cost estimate for retail materials changed due to fluctuating retail prices and other factors that occurred between the date of the finalization of the SONAR and his preparation for testimony at the underlying hearing.¹¹¹ The Board is assuming that a similar explanation is behind the difference between the Commenter's estimated \$2000 cost increase identified in David Seigel's written comment dated April 13, 2020, their 11 to 15 percent increase as testified to by Tony Wiener, and their \$1000 estimated increase as testified to by Nick Erickson at the time of hearing.¹¹²

80. The Board further stated that it is difficult to quantify costs of an entire model building code and reasonable minds can differ as to their approach and ultimate cost estimates. As noted by the court of appeals, "[w]e can envision endless permutations in cost comparison, depending on the particular work that a particular business or homeowner desires on a particular property."¹¹³ For that reason, the court in *Water in Motion* determined that it is only necessary for a board or agency to ascertain costs under §14.131 "through reasonable efforts" and that it is "not required to undertake a complex and hypothetical analysis."¹¹⁴

81. The Board agreed that costs are not absorbed by the builder or electrician and that the cost of compliance gets passed to the homeowner, who will ultimately bear the cost of compliance with the proposed rule.¹¹⁵

¹⁰⁸ *Id.* at 000022-23.

¹⁰⁹ See Tr. at 71-72.

¹¹⁰ See *id.* at 65-74.

¹¹¹ See *id.*

¹¹² Tr. 80-81, 88-89; Board's Preliminary Response to Comments at 6 (Sept. 8, 2020).

¹¹³ *Water in Motion, Inc. v. Minnesota Dep't of Labor & Indus.*, No. A16-0335, 2016 WL 7041978, at *8 (Minn. Ct. App. Dec. 5, 2016).

¹¹⁴ *Id.*; see also Board's Preliminary Response to Comments at 6 (Sept. 8, 2020).

¹¹⁵ Board's Preliminary Response to Comments at 7 (Sept. 8, 2020).

82. Even the Commenters' larger estimates are below the cost thresholds in Minn. Stat. § 14.127, subd. 1 (2020).

83. The Administrative Law Judge finds that the Board reasonably calculated the range of potential costs of compliance with these rules, adequately explained its calculations in the SONAR and further explained its calculations and considerations during the public hearing and in its responsive comments.

G. Regulatory Factor 6: Analysis of Costs of Not Adopting Proposed Rule, Including Impacts to Small Businesses and Cities

84. The Commenters assert that the Board's response to Regulatory Analysis Factor 6 is deficient because the Board incorrectly stated that all nine states with which Minnesota has reciprocity agreements concerning electrician licensure are in the process of adopting the 2020 NEC. According to the Commenters, several of these states have not begun such processes.¹¹⁶

85. The Board acknowledged the error in its SONAR. Yet, the Board argues that failure to adopt the most recent version of the NEC is one of several factors that the Board uses in determining whether or not to grant reciprocity to states that currently apply for reciprocity with the Board. The Board states it recently voted to deny reciprocity with Texas and Wisconsin because, among other factors, neither state had any rulemaking in process to review and adopt the 2020 version of the NEC. The Board thus says that it stands by its response to Factor 6 concerning the other possible consequences of not adopting the proposed rule. Additionally, the Board fails to see how the Commenters were prejudiced by its allegedly deficient response to this inquiry.¹¹⁷

86. The Administrative Law Judge finds that the Board's error with respect to the rulemaking processes in other states was not material to the record in this proceeding or prejudicial to the Commenters; and also finds that the Board adequately addressed Factor 6 in its SONAR and responsive comments.

H. Regulatory Factor 7: Assessment of Differences Between Proposed Rule and Existing Federal Regulations

87. The Board explained that there are no federal regulations that address electrical code issues in the construction of non-federally owned buildings.¹¹⁸

88. In post-hearing comments regarding Factor 8 below, HFM stated that the Board failed to consider several federal laws, which it characterized as "tangential," that, it argues, cumulatively address their goal and stated purpose of providing affordable housing for all Minnesotans. As an example, it points to the fact that the Supreme Court

¹¹⁶ Tr. at 94-95.

¹¹⁷ Board's Preliminary Response to Comments at 7 (Sept. 8, 2020).

¹¹⁸ Ex. D. at 000018.

has established that the Federal Fair Housing Act can be violated if policies affecting housing prices disparately impact protected groups of people. *Texas Department of Housing and Community Affairs v. Inclusive Communities Project, Inc.*, 135 S. Ct. 2507 (2015).¹¹⁹

89. The Board responded that while providing for affordable housing is an admirable goal and purpose, the main goal and purpose of the proposed rule is the establishment of a uniform electrical installation standard that provides for the safety and protection of electrical installers and home/building owners and residents. Compliance costs certainly come into play in that equation, but it cannot override the proposed rule's stated purpose since electrical safety and protection from electrical fires should be equally available to all regardless of an individual's ability to afford a home mortgage payment or pay the rent.¹²⁰

90. The Administrative Law Judge finds that the Board adequately addressed Factor 7 in its SONAR.

I. Regulatory Factor 8: Assessment of Cumulative Effect of Rule with Other Federal and State Regulations Related to Specific Purpose of the Rule

91. The Board explained that there are no federal regulations that address electrical code issues in the construction of non-federally owned buildings, so there is no impact of cumulative effect. There are no other state regulations related to the specific purpose of the rule.¹²¹

92. HFM addressed its points, outlined above under Factor 7, to this factor.¹²²

93. The Board responded as noted above under Factor 7.

94. The Administrative Law Judge finds that the Board adequately addressed Factor 8 in the SONAR.

J. Compliance with Minn. Stat. § 14.131

95. The Administrative Law Judge finds that the Department has met the requirements set forth in Minn. Stat. § 14.131 for assessing the impact of the proposed rules, including consideration and implementation of the legislative policy supporting performance-based regulatory systems, and the fiscal impact on units of local government.

¹¹⁹ HFM Post-Hearing Comments at 8 (Letter of D. Siegel, Sept. 8, 2020).

¹²⁰ Board's Final Response to Comments at 7 (Sept. 15, 2020).

¹²¹ Ex. D. at 000018.

¹²² HFM Post-Hearing Comments at 8 (Letter of D. Siegel, Sept. 8, 2020).

1. Analysis of the Impacts to Small Businesses and Cities

96. Minn. Stat. § 14.127 (2020) requires the Department to “determine if the cost of complying with a proposed rule in the first year after the rule takes effect will exceed \$25,000 for: (1) any one business that has less than 50 full-time employees; or (2) any one statutory or home rule charter city that has less than ten full-time employees.” The Department must make this determination before the close of the hearing record and the Administrative Law Judge must review the agency’s conclusion.¹²³

97. The Commenters argue that the Board’s analysis of the possible cost of compliance of the proposed rule on small businesses and small cities during the first year after the proposed rule takes effect is deficient. The Commenters assert that, using NAHB estimated compliance costs of \$800 per single-family home and the fact that it is common for small construction businesses to build at least 30 such homes in a year, compliance costs will total over \$25,000 for homebuilders or over \$32,877 for building a standard 48-unit apartment complex.¹²⁴

98. The Board argues that the Commenters’ calculations are flawed, pointing to the fact that \$800 multiplied by 30 is less than \$25,000, and that the NAHB report uses a different base-cost increase for commercial residential buildings depending on the type of building and number of units it contains, among other factors. The Board also argues that, by the Commenters’ own logic, the compliance costs are passed along to the homebuyers and are not borne by the homebuilders. When the fact that these costs are borne by the building owners is considered, the Board argues that it is not plausible to find that the thresholds in Minn. Stat. § 14.127 are exceeded.¹²⁵

99. The Administrative Law Judge does not adopt the Board’s analysis of pass-through costs. The text of Minn. Stat. § 14.127, subd. 1 requires the Board to determine whether the “cost of complying with [the] proposed rule” will “exceed \$25,000 for . . . any one business that has less than 50 full-time employees.” The language of the statute does not indicate whether the cost of compliance is less than the amounts that will be, as HFM asserted was the case in this matter, passed on to the end customer, and reading it as such may render the statutory language meaningless.

100. The Administrative Law Judge ultimately concurs, however, with the Board’s determination that the compliance costs of the proposed rules do not exceed the thresholds set forth in Minn. Stat. § 14.127. As detailed in the Factor 5 (compliance cost) analysis above, the Board supplied the hearing record with ample evidence of the costs of complying with the 2020 NEC.¹²⁶ Given the “endless permutations in cost comparison, depending on the particular work that a particular business or homeowner

¹²³ Minn. Stat. § 14.127, subds. 1, 2.

¹²⁴ Tr. at 95-97.

¹²⁵ Board’s Preliminary Response to Comments at 7-8 (Sept. 8, 2020).

¹²⁶ Tr. at 65-74; see also Ex. K11 (NAHB Cost Report).

desires on a particular property,” the Board was required to undertake “reasonable efforts” to estimate costs and was “not required to undertake a complex and hypothetical analysis.”¹²⁷ These compliance costs do not warrant a finding that the thresholds in Minn. Stat. § 14.127 are exceeded. The Commenters speculated that a small business may construct a certain number of homes that may exceed the threshold. The Commenters’ assertions that, based on a speculative number of homes that may be constructed, a small business may incur costs of over \$25,000, is not enough to overturn the Board’s reasoned and well-supported analysis of compliance costs.

101. The Administrative Law Judge finds that the Department has made the determinations required by Minn. Stat. § 14.127.

2. Adoption or Amendment of Local Ordinances

102. Under Minn. Stat. § 14.128 (2020), the Department must determine if a local government will be required to adopt or amend an ordinance or other regulation to comply with a proposed agency rule. The Department must make this determination before the close of the hearing record, and the Administrative Law Judge must review the determination and approve or disapprove it.¹²⁸

103. The Department concluded that no local government will need to adopt or amend an ordinance or other regulation to comply with the proposed rules. The Agency’s proposed rule should not require local governments to adopt or amend those more general ordinances and regulations.¹²⁹

104. No Commenters contested the Department’s finding regarding Minn. Stat. § 14.128.

105. The Administrative Law Judge finds that the Department has made the determination required by Minn. Stat. § 14.128 and approves that determination.

IV. Rulemaking Legal Standards

106. The Administrative Law Judge must make the following inquiries: whether the agency has statutory authority to adopt the rule; whether the rule is unconstitutional or otherwise illegal; whether the agency has complied with the rule adoption procedures; whether the proposed rule grants undue discretion to government officials; whether the rule constitutes an undue delegation of authority to another entity; and whether the proposed language meets the definition of a rule.¹³⁰

¹²⁷ *Water in Motion*, 2016 WL 7041978, at *8 (Minn. Ct. App. Dec. 5, 2016).

¹²⁸ Minn. Stat. § 14.128, subd. 1.

¹²⁹ Ex. D at 000020.

¹³⁰ See Minn. R. 1400.2100.

107. Under Minn. Stat. § 14.14, subd. 2 (2020), and Minn. R. 1400.2100 (2019), the agency must establish the need for, and reasonableness of, a proposed rule by an affirmative presentation of facts. In support of a rule, the agency may rely upon materials developed for the hearing record,¹³¹ “legislative facts” (namely, general and well-established principles, that are not related to the specifics of a particular case, but which guide the development of law and policy),¹³² and the agency’s interpretation of related statutes.¹³³

108. A proposed rule is reasonable if the agency can “explain on what evidence it is relying and how the evidence connects rationally with the agency’s choice of action to be taken.”¹³⁴ By contrast, a proposed rule will be deemed arbitrary and capricious where the agency’s choice is based upon whim, devoid of articulated reasons or “represents its will and not its judgment.”¹³⁵

109. An important corollary to these standards is that when proposing new rules an agency is entitled to make choices between different possible regulatory approaches, so long as the alternative that is selected by the agency is a rational one.¹³⁶ Thus, while reasonable minds might differ as to whether one or another particular approach represents “the best alternative,” the agency’s selection will be approved if it is one that a rational person could have made.¹³⁷

V. Rule by Rule Analysis

110. As noted above, the role of the Administrative Law Judge during a legal review of rules is to determine whether the Department has made a reasonable selection among the regulatory options that it has available. The judge does not fashion requirements that the judge regards as best suited for the regulatory purpose. This is because the delegation of rulemaking authority is drawn from the Minnesota Legislature and is conferred by the Legislature upon the agency. The legal review under the Administrative Procedure Act begins with this important premise.¹³⁸

¹³¹ See *Manufactured Housing Institute v. Pettersen*, 347 N.W.2d 238, 240 (Minn. 1984); *Minnesota Chamber of Commerce v. Minnesota Pollution Control Agency*, 469 N.W.2d 100, 103 (Minn. Ct. App. 1991).

¹³² Compare generally *United States v. Gould*, 536 F.2d 216, 220 (8th Cir. 1976).

¹³³ See *Mammenga v. Agency of Human Services*, 442 N.W.2d 786, 789-92 (Minn. 1989); *Manufactured Housing Institute v. Pettersen*, 347 N.W.2d 238, 244 (Minn. 1984).

¹³⁴ *Manufactured Hous. Inst.*, 347 N.W.2d at 244.

¹³⁵ See *Mammenga*, 442 N.W.2d at 789; *St. Paul Area Chamber of Commerce v. Minn. Pub. Serv. Comm’n*; 251 N.W.2d 350, 357-58 (1977).

¹³⁶ *Peterson v. Minn. Dep’t of Labor & Indus.*, 591 N.W.2d 76, 78 (Minn. Ct. App. 1999).

¹³⁷ *Minnesota Chamber of Commerce*, 469 N.W.2d at 103.

¹³⁸ See *Manufactured Housing Institute*, *supra*, 347 N.W.2d at 244 (The Court instructs that the state courts are to restrict the review of agency rulemaking to a “narrow area of responsibility, lest [the court] substitute its judgment for that of the agency”); see also *In the Matter of the Proposed Rules of the Minnesota Pollution Control Agency Governing Permits for Greenhouse Gas Emissions*, REPORT OF THE ADMINISTRATIVE LAW JUDGE, Minnesota Rules Chapters 7005, 7007 and 7011, OAH 8-2200-22910-1 at 20 (2012) (<http://mn.gov/oah/images/2200-22910-GreenhouseGas-dismissal.pdf>).

111. Several sections of the proposed rules were not opposed by any member of the public and were adequately supported by the SONAR. Accordingly, this Report will not necessarily address each comment or rule part. Rather, the discussion that follows below focuses on those portions of the proposed rules as to which commentators prompted a genuine dispute as to the reasonableness of the Agency's regulatory choice or otherwise requires closer examination.

112. The Administrative Law Judge finds that the Department has demonstrated by an affirmative presentation of facts the need for and reasonableness of all rule provisions that are not specifically addressed in this Report.

113. Further, the Administrative Law Judge finds that all provisions that are not specifically addressed in this Report are authorized by statute and that there are no other defects that would bar the adoption of those rules.

A. 2020 NEC Section 210.8(A): Ground-Fault Circuit-Interrupter Protection for Dwelling Units

114. In his April 13, 2020, written comment, David Siegel, Executive Director of HFM, stated that the provision requiring GFCI protection for receptacles serving 250-volt appliance is unnecessary because only a single appliance is serviced by a single 250-volt connection. According to this Commenter, these appliances are stationary, and the risk of water is virtually non-existent.¹³⁹

115. The other pre-hearing comments received by the Board simply requested that the language of the 2017 NEC be retained, rather than adopting the language of the 2020 NEC, to eliminate the requirement that receptacles serving 250-volt appliances be protected with GFCIs.¹⁴⁰

116. In comments submitted following the hearing, Grace Keliher, Executive Vice President of the Builders Association of Minnesota (BAM), suggested that the above-referenced section be revised to only apply to 125-volt receptacles. She argues that GFCI protection for 250-volt receptacles is only necessary in older homes, and new construction homes with updated electrical systems allegedly do not present the same hazards.¹⁴¹ She also refers to an "unfortunate event" as the impetus for this code change and alleges that event was only possible with an older installation. She also disputes the NFPA Code Committee's finding that 250-volt receptacles present the same hazards as 125-volt receptacles because 250-volt receptacles generally only service one large appliance, are not used for extension cords or other appliances, and less accessible to the homeowner.¹⁴²

¹³⁹ See generally Exhibit I of the Board's Part 1400.2220 Exhibits for Proposed Rule Hearing and Record.

¹⁴⁰ *Id.*

¹⁴¹ Grace Keliher's August 17, 2020, post-hearing written comments.

¹⁴² See *id.*

117. Angie Wiese, President of the Fire Marshal's Association of Minnesota, testified that GFCI protection for ranges installed within six feet of the sink is necessary. She noted that many ranges would not require this protection because they are not electric or within six feet of a sink.¹⁴³

118. Amy Acton, Chief Executive Officer of the Phoenix Society for Burn Survivors, wrote in support of adoption of the 2020 NEC without amendment and specifically supported the expanded GFCI requirements. She noted that the amendments prevent children from being electrocuted or shocked near appliances and bathtubs.¹⁴⁴

119. In its response, the Board stated that GFCIs are intended to protect individuals from a fatal electric shock. A ground-fault condition occurs when an electrical current takes an unintentional path back to the source of the electricity by coming into contact with a grounded surface, such as the metal case of an electric power tool or a person standing in damp grass. This unintentional electrical current is often referred to as "leakage current." Ground faults commonly occur in a dwelling due to worn wire insulation, miswiring, or when a faulty cord or plug on an appliance causes the hot wire to directly connect with another pathway to the ground, which can be a person. This hazard of electrical shock is increased in the presence of moisture or water, which is an excellent conductor of electrical current. As Dean Hunter explained in his testimony, a GFCI "protect[s] people from the hazards of electrical shock" and is able to do this because "it senses the imbalance of electrical current between the hot and the neutral conductor."¹⁴⁵ When this imbalance of electrical current occurs, a GFCI causes the circuit to de-energize and shuts off the flow of electricity, thereby preventing an individual using a faulty appliance from experiencing electric shock.¹⁴⁶

120. The Board further explained that the location of the 250-volt receptacle does not necessarily mitigate potential hazards. The Board noted that while it may be correct that 250-volt receptacles are *generally* installed behind a range or dryer, but if so they are still accessible to the consumer as is any other receptacle in the home that is located behind furniture or any other large object. Consequently, the location of the receptacle has little to no impact on the hazards posed by water and electricity, so the Board believes the GFCI expansion contained in the 2020 NEC is needed and reasonable.¹⁴⁷

121. While it is undeniable that the proposed rule will result in real impacts on the prices of new homes, the Department made a reasoned decision that, after considering the costs and benefits, expanding GFCI requirements to receptacle outlets rated at 250-volts is an available, reasonable, and needed protection against potential

¹⁴³ Tr. at 99-100.

¹⁴⁴ Amy Acton's August 13, 2020, comments.

¹⁴⁵ See Tr. at 23.

¹⁴⁶ Board's Preliminary Response to Comments at 10 (Sept. 8, 2020); See *generally* Tr. at 23-24.

¹⁴⁷ *Id.*

hazards, including electrocution. The proposed rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

B. 2020 NEC Section 210.8(A)(5) GFCI Protection Basements

122. The pre-hearing written comments received by the Board suggested that this section be amended to retain the language of the 2017 NEC so that GFCI protection is only required in unfinished portions or areas of the basement not intended as habitable rooms.¹⁴⁸

123. Grace Keliher's written comments submitted following the hearing also proposed that this section be amended to retain the language of the 2017 NEC. The rationale given is that water is not expected in the finished areas of basements, and there has been no expansion of GFCI requirements for basements in the past 30 years. She reasons, this shows there is no known benefit to requiring finished basements to be covered by GFCIs.¹⁴⁹ She further noted that "[n]ewer homes require drain tile and water proofing materials which go beyond the traditional parging mortar of the past," and so concludes that GFCI requirements are unnecessary for newer homes and any expansion to GFCI requirements in basements should be applied only to older homes.¹⁵⁰

124. Angie Wiese testified that GFCI protection in Minnesota basements is warranted whether the basement is finished or not, because Minnesota basements have both a tendency to retain moisture and flood from snow melt or rain events.¹⁵¹

125. The Board responded that it does not agree that expansion of GFCI protection in basements is unnecessary. It concurs with Ms. Wiese that protection is needed because of the inherent risk of moisture in basements, a space that is below grade level. Furthermore, it believes this code section provides clarification that will result in uniform application and enforcement of the code.¹⁵²

126. The Board explained that the code has expanded GFCI protection requirements in various portions of a home since the early 1970s. The 2020 NEC is a continuation of that expansion of GFCI protection into spaces of the home that are prone to water and moisture. As explained by Dean Hunter in his testimony for the Board, the changes to section 210.8(A)(5) eliminate confusion as to what is an unfinished space, or one not intended for habitation, by requiring all portions of the basement to be protected, which will allow uniform enforcement and application of the code.¹⁵³

¹⁴⁸ See *generally* pre-hearing written comments, reproduced in Ex. I of the Board's Part 1400.2220 Exhibits for Proposed Rule Hearing.

¹⁴⁹ See Grace Keliher's August 17, 2020, post-hearing written comments.

¹⁵⁰ *Id.*

¹⁵¹ See Tr. at 99; see *also* Wiese's undated Post-Hearing Comment entitled "Notes from 2020 NEC Hearing."

¹⁵² Board's Preliminary Response to Comments at 11 (Sept. 8, 2020).

¹⁵³ *Id.*; Tr. at 31.

127. The Board also explained that the distinction between a finished basement and an unfinished basement is not necessarily useful when discussing the risk of electrical hazards. Unfinished areas of the basement do expose individuals to additional hazards caused through the indirect contact with the earth through concrete floors, masonry walls, and steel columns embedded in concrete floors. Finished basement floors that only typically have a painted concrete floor or tiled areas with masonry grout in contact with a concrete floor or masonry walls that are indirectly in contact with the earth do no more than slightly mitigate the hazards that can be caused by an individual in contact with a damp floor interacting with electrical hazards.¹⁵⁴

128. The Board further explained that the improvements in the built environment have indeed tended to lessen the problem of water that frequently occurs because of rain, snowmelt, or groundwater seeping into the basement. The “traditional parging mortar of the past” is a technique left to the past, having been largely abandoned since the 1960s. Drain tile has been in use since the 1980s and has mitigated, but in no way eliminated, flooding and moisture in basements. Due to Minnesota’s climate, it is difficult to entirely prevent water from entering the home, such as when a significant snowmelt and rain event occur simultaneously. Soils, intended to assist with drainage, can settle over time in such a way as to direct rain and snowmelt runoff towards the home. Water can also infiltrate from the outside when a large amount of volume is present, such as when a gutter or downspout is clogged. The basement, as the lowest point in the home, can also be affected by water or moisture from other sources within the home, such as clogged or collapsed drains or leaking pipes in an area adjacent to or above the basement. Additionally, basements are often cooler areas of the home and subject to condensation during the summer months, which again contributes to moisture in that space. Because Minnesota basements are prone to moisture and water infiltration, whether in newer or older homes, in finished or unfinished areas, the Board believes that it is reasonable to require these spaces to have GFCI protection to mitigate the hazards of electric shock.¹⁵⁵

129. The Administrative Law Judge finds that the Board considered the costs and benefits of expanding GFCI protection to finished portions of basements and made a reasoned decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

C. 2020 NEC Section 210.8(F): Outdoor Outlets

130. Grace Keliher proposed deleting the requirement that outdoor outlets up to 250-volts and 50 amperes have GFCI protection.¹⁵⁶

131. This provision would apply to circuits serving air-conditioner (A/C) condenser units. Ms. Keliher agrees that GFCIs are effective for standard “convenience

¹⁵⁴ Board’s Preliminary Response to Comments at 11 (Sept. 8, 2020).

¹⁵⁵ *Id.*

¹⁵⁶ See Grace Keliher’s August 17, 2020, post-hearing written comments.

receptacles in a damp or wet location but should not be used for hardwired appliances.” Her comments allege that there is no data to support expanding GFCI protection to all outdoor outlets and the only evidence to support expansion is due to an “unqualified individual” performing an installation. Furthermore, the Commenter believes that it has not been determined if A/C condenser units will operate on a GFCI protected circuit. She lists several consequences to A/C condenser units failing to operate on a GFCI protected circuit, including “unhealthy conditions and property damage inside the home due to heat, humidity and mold growth” if the home is unoccupied. The Commenter also expressed concerns with unwanted tripping of the circuit breaker and compatibility with heat pumps, as well the compatibility of GFCI protection with older condenser units.¹⁵⁷

132. In comments submitted before the hearing, John Nordell, a master electrician, expressed concerns about the costs of this requirement and the availability of materials. He was also concerned with the potential for non-compliance due to the costs, as well as nuisance tripping.¹⁵⁸

133. The Board responded that it does not agree that GFCI protection for A/C condenser units is unnecessary. The Board argues that the exterior location of A/C condenser units is damp outdoor spaces that can and do pose an electrical hazard where a ground fault exists.¹⁵⁹

134. The Board explained that the 2020 NEC requires GFCI protection for dwelling unit outdoor outlets supplied by single-phase branch circuits rated 150-volts or less to ground, and 50-amperes or less, which includes 240-volt A/C units. Article 100, part I, of the 2020 NEC defines “outlet” as a point on the wiring system at which current is taken to supply utilization equipment. There are various types of outlets, including receptacle outlets, appliance outlets, lighting outlets, smoke alarm outlets, and equipment outlets. With the exception of outdoor luminary or lighting outlets, the 2020 NEC requires all outdoor outlets to have GFCI protection, including receptacle outlets and equipment outlets that supply A/C condenser units.¹⁶⁰

135. Furthermore, the Board contends that the expansion of GFCI protection to all outdoor outlets is necessary and reasonable due to the known hazards that occur when an individual comes into contact with electricity in a wet or damp area. Similar to the code change requiring GFCI protection for 250-volt rated receptacle outlets discussed above, the impetus for this code change was the electrocution of several individuals who came into contact with A/C condenser units with a ground fault. A/C condenser units are rarely inspected or serviced after the original installation and are continuously exposed to the elements. The unit could experience an electrical malfunction yet continue to operate seemingly correctly. This is particularly hazardous because an individual can be completely unaware that an electrical malfunction is present. Furthermore, an individual does not necessarily need to come into contact with

¹⁵⁷ *Id.*

¹⁵⁸ See John Nordell’s July 31, 2020, written comments.

¹⁵⁹ Board’s Preliminary Response to Comments at 12 (Sept. 8, 2020).

¹⁶⁰ *Id.*

the wiring to be harmed. When a ground fault occurs in an A/C condenser unit, the unit's outer metal housing can become electrified so that an individual who touches it may experience an electric shock or electrocution.¹⁶¹

136. Commenters also expressed concern about A/C condenser units operating on a GFCI protected circuit being subject to nuisance tripping.¹⁶²

137. The Board responded that GFCI protection is required for devices with similar loads, including compressor-based refrigeration equipment and variable-speed drives for motors on commercial kitchen appliances, such as mixers. Furthermore, swimming pool pump motors rated 15- or 20-amperes, 120-volt through 240-volt, single-phase have been required to have GFCI protection since the 2002 NEC and have functioned correctly and safely in high-humidity areas and wet locations. Therefore, it is unlikely that an A/C condenser unit that is on a GFCI protected circuit will experience nuisance tripping.¹⁶³

138. In response to concerns about the effects of nuisance tripping leading to mold and moisture in a house, the Board responds that the operation of an A/C condenser unit is only one method that can be used to mitigate mold and moisture when the house is not occupied for an extended period. Newer homes are equipped with a balanced ventilation system that provides fresh air and vents out stale air, thereby improving indoor air quality. Excessive moisture and mold can occur because of standing water within the home due to leaking plumbing and wet items left in the home, and these issues can be resolved prior to leaving the home unoccupied. Although excessive moisture and mold damage is troublesome, ground fault protection for A/C condenser units is necessary to protect individuals from the hazards posed by electrocution.¹⁶⁴

139. Responding to the concerns raised about the costs of GFCI protection, the Board noted that there is a cost of approximately \$94 for GFCI protection for A/C condenser units, which, the Board asserts, is a modest sum given the needed protection it provides.¹⁶⁵ Regarding comments about availability, the Board noted that with the recent COVID-19 crisis, there has been an increase in home improvement projects. This rise has resulted in increased difficulty in obtaining supplies from big-box retailers. Regarding concerns about non-compliance, the Board responded that with any code provision there are some individuals who will not comply for various reasons: costs, ignorance of code requirements, or finding the requirement overly burdensome or that it simply interferes with their preferred aesthetics. The purpose of the code, however, is to provide a minimum safety standard for individuals and their property with

¹⁶¹ *Id.*

¹⁶² See Grace Keliher's August 17, 2020, post-hearing written comments and Attachment A to same.

¹⁶³ Board's Preliminary Response to Comments at 13 (Sept. 8, 2020).

¹⁶⁴ *Id.*

¹⁶⁵ See Ex. K10 of the Board's Part 1400.2220 Exhibits for Proposed Rule Hearing and Record.

costs as only one factor in that determination. Accordingly, the Board believes that the 2020 NEC's GFCI expansion to outdoor outlets is needed and reasonable.¹⁶⁶

140. The Administrative Law Judge finds that the Board considered the costs and benefits of expanding GFCI protection to outdoor outlets and made a reasoned decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

D. 2020 NEC Section 210.12 Arc-Fault Circuit-Interrupter (AFCI) Protection

141. HFM's David Siegel suggested that the Board amend this section to delete AFCI protection requirements for newly built residential dwellings because fires that could be prevented by AFCIs are most likely to occur in dwellings more than 40 years old. Furthermore, the Commenter alleges that AFCI technology frequently causes nuisance tripping that has resulted in call-backs and questions from new homeowners within the past two years.¹⁶⁷ Individual HFM members shared this concern and requested that this provision be deleted.¹⁶⁸

142. Grace Keliher also recommended deleting AFCI protection requirements for residential dwellings because this provision is applied to newly built homes but fires that could be prevented by this technology are most likely to occur in dwellings more than 40 years old. She also gives an overview of the history of requirements for arc-fault circuit-interrupter protections in the NEC. These requirements were introduced in the 1999 NEC with an effective date of January 1, 2002, and were based on several U.S. Consumer Product Safety Commission reports. She believes that this data is erroneous based on later reports showing AFCIs to allegedly have minimal benefit.¹⁶⁹

143. Tony Wiener, homebuilder for Cardinal Builders, testified on behalf of Housing First that he has received complaints about nuisance tripping in homes, including a customer whose CPAP machine was tripping an arc-fault circuit breaker.¹⁷⁰

144. The Board explained that an AFCI is a type of circuit breaker that is located in the home's main electrical panel. It protects against the effects of arcing faults, which can cause electrical fires. Arcing faults are uncontrolled electrical arcs created by current flowing through an unintended path, which can create sufficient heat to spark a fire. An arc-fault can occur at loose electrical connections and terminations, or where electrical wiring within the walls, or flexible cords used for appliances and other devices, have been damaged.¹⁷¹

¹⁶⁶ Board's Preliminary Response to Comments at 13 (Sept. 8, 2020).

¹⁶⁷ See Housing First's April 13, 2020, pre-hearing written comments, reproduced in Ex. I of the Board's Part 1400.2220 Exhibits for Proposed Rule Hearing.

¹⁶⁸ Ex. I of the Board's Part 1400.2220 Exhibits for Proposed Rule Hearing.

¹⁶⁹ Grace Keliher's August 17, 2020, post-hearing written comments.

¹⁷⁰ Tr. at 82.

¹⁷¹ Board's Preliminary Response to Comments at 15 (Sept. 8, 2020); Tr. at 24.

145. The Board further explained that Arc faults can occur in a home in a variety of simple ways such as a nail piercing the wiring in a wall thus creating sparking and combusting nearby flammable materials such as carpet, drapes, furniture and other common household objects. In addition, worn or damaged cords, switches, and power strips can cause faults.¹⁷² According to the Board, these hazards exist in all homes regardless of size or year of construction. An older home may be more prone to these hazards simply because electrical components age and deteriorate over time, but in the Board's opinion that is not a viable argument against protecting new homes and their occupants as well against these hazards that develop over time.¹⁷³

146. The Board states that AFCI devices help to protect against fire by utilizing advanced technology to continuously monitor the electrical current in a circuit by looking for unwanted arcing signatures, and then de-energizing the electricity when dangerous arcing signatures are detected. This monitoring includes the branch circuit wiring from the electrical panel, light switches, light fixtures, receptacle outlets, devices that are "cord-and-plug connected" into the receptacle outlets (e.g., table lamps, vacuum cleaners, television monitors), and anything that is "hard-wired" like an undercounter dishwasher. The Board asserts that, AFCI protection is about fire prevention, protecting property and more importantly, saving lives.¹⁷⁴

147. The Board also offered an extensive history of AFCI technology. In a nutshell, the Board states that the NEC has gradually expanded AFCI protection as electricity demands have extended throughout homes, increasing arcing risks, at the same time nuisance tripping has diminished as appliance compatibility has increased.¹⁷⁵

148. Responding to a comment that NFPA data regarding house fires does not support the AFCI requirements for residential dwellings, the Board argues that the number of house fires prevented cannot be ascertained, as data is not collected on fire events that are prevented.¹⁷⁶ However, the Board provides evidence that there is a correlation between a decline in home fires and the expansion of AFCI protection.¹⁷⁷

149. The Board notes that the 2020 NEC does not expand AFCI protection for residential dwellings such as apartments and houses but expands AFCI protection so it now includes similar transient use living quarters such as dormitories, guest rooms and guest suites in hotels and motels, and patient-sleeping rooms in nursing homes and limited-care facilities. The Board contends that AFCI protection is effective at preventing arc faults in permanent dwellings, such as homes and apartments, and it is reasonable to expand that same protection to individuals regardless if their use of a dwelling is permanent or temporary in nature.¹⁷⁸

¹⁷² *Id.*

¹⁷³ *Id.* at 16.

¹⁷⁴ *Id.*

¹⁷⁵ *Id.* at 16-17.

¹⁷⁶ *Id.* at 17.

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

150. The Administrative Law Judge finds that the Board considered the costs and benefits of expanding AFCI protection and made a reasoned, research-based decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

E. 2020 NEC Section 210.52(C)(2): Island and Peninsular Countertops and Work Surfaces

151. HFM and other Commenters state that Section 210.52 (C) related to outlets for island and peninsular countertops is overly burdensome. They state that it will increase costs for engineering design and labor to ensure that the requirements are met while maintaining the designs the market demands.¹⁷⁹

152. The Board responded that the 2020 NEC, as well as previous editions, includes requirements for the number and location of receptacle outlets for dwelling unit kitchen countertops and work surfaces. This is necessary so the homeowner has a sufficient number of receptacle outlets for small kitchen appliances without resorting to less safe measures such as the use of extension cords.¹⁸⁰

153. Dean Hunter testified for the Board on this provision, stating the 2017 NEC required only one receptacle outlet at a kitchen island or peninsula. The 2020 NEC revised this requirement so there must be one receptacle outlet for the first 9 square feet of an island or peninsula and then one for each additional 18 square feet.¹⁸¹ One of these receptacle outlets is required to be placed within 2 feet of the outer end of the peninsula or island, but the other receptacle outlets may be placed as a builder or homeowner chooses them to be placed.¹⁸² Because an additional receptacle outlet is only required for every additional 18 square feet, a peninsula or island measuring up to 27 square feet is only required to have 2 receptacle outlets in total. These 2 receptacle outlets may be placed in the same two-gang electrical box (a square electrical box that would be housing 2 receptacle outlets). Or, as Mr. Hunter explained, a receptacle plug strip with multiple receptacle outlets may be placed right underneath the edge of the island and peninsular space.¹⁸³

154. The Board asserts that because this provision provides obvious benefits to homeowners and flexibility in its application it will not result in additional costs, labor or design time.¹⁸⁴

155. The Administrative Law Judge finds that the Board considered the costs and benefits of the 2020 NEC Section 210.52(C)(2) provision concerning outlets for countertop islands and peninsulas and made a reasoned decision to adopt the provision

¹⁷⁹ Ex. I at 000203.

¹⁸⁰ Board's Preliminary Response to Comments at 18 (Sept. 8, 2020); Tr. at 37.

¹⁸¹ *Id.* at 36.

¹⁸² *Id.* at 38.

¹⁸³ *Id.* at 39.

¹⁸⁴ Board's Preliminary Response to Comments at 18 (Sept. 8, 2020).

as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

F. 2020 NEC Section 230.67 Surge-Protective Devices (SPDs)

156. The 2020 NEC requires an SPD to be an integral part of the service equipment or it must be located immediately adjacent to the service equipment. The SPD is required to be either a Type 1 or Type 2. Type 1 SPDs are permitted to be directly connected to the supply side of the service disconnecting means. Type 2 SPDs are required to be connected to a circuit breaker. Both Type 1 and Type 2 SPDs provide whole-house surge protection.¹⁸⁵

157. HFM and other Commenters objected to the addition of requirements related to surge protection devices. HFM noted that the state building code is meant to protect the health and safety of occupants and durability for the structure, but this provision is about maintaining the appliances in the rare event that an electrical surge causes damage. HFM went on to note that surge protectors can be overly sensitive, and the activation of surge protection can produce a complete loss of power during winter months—shutting down furnaces. HFM contends that during an especially cold winter, homebuyers could see massive damage from burst pipes. HFM contends that this provision is in conflict with the intent of the code and should be removed.¹⁸⁶

158. Grace Keliher also proposed that this section be deleted because “[t]he code-making panel did not provide adequate substantiation to clearly identify a risk to equipment or safety concern to warrant this new requirement,” so installation of a surge protection device should remain the choice of the consumer, rather than required by the code. See Grace Keliher’s August 17, 2020, post-hearing written comments. Furthermore, the code language lacked specificity regarding “which conductors are to be protected or what the minimum short circuit current rating, the minimum nominal discharge current rating or the voltage protection rating should be.” In so doing, the Commenter assumes that as a result of this lack of specificity, the lowest level of protection will be provided. The Commenter also noted that the surge protection device requirement was not extended to other occupancies.¹⁸⁷

159. Angie Wiese commented at the hearing that the 2020 NEC provides several compliance options for SPD protection depending on building or home type, and that any cost analysis provided for this protection is less than the cost of a new iPhone or other electronic device that would be protected by the SPD.¹⁸⁸

¹⁸⁵ *Id.* at 19 (Sept. 8, 2020).

¹⁸⁶ Ex. I at 000203.

¹⁸⁷ Grace Keliher’s August 17, 2020, post-hearing written comments.

¹⁸⁸ Tr. at 100-101.

160. At the hearing, Dick Johnson asked questions about the cost to replace an SPD if it was permanently damaged by a transient voltage and could no longer function.¹⁸⁹

161. At the hearing, Dean Hunter explained on behalf of the Board that SPDs are commonly used for computers and provide protection from voltage surges by limiting transient voltages from affecting electronic equipment, including a home's electrical systems.¹⁹⁰ Transient voltages that affect electronic equipment often occur during lightning events or because of a downed power line.¹⁹¹

162. The Board contends that a common misunderstanding of an SPD located in the electrical panel is that when the device is activated, the power to the whole home will be shut down until the device is replaced. This is simply not the case and a dwelling that does not have SPD protection is more likely to suffer a complete loss of power. The SPD is a sacrificial device.¹⁹² The Board further explains, that if a transient voltage of sufficient strength affects the home, then the SPD will be affected by this voltage, thereby protecting the rest of the electronics and electrical systems in the home. The circuits in the panel will continue to function after the event, thereby allowing the electronic devices and systems in the home to continue to function.¹⁹³ The Board admits that if the transient voltage exceeds the rating of the SPD, it may no longer function and must be replaced. The cost for an SPD is between \$40 and \$80, and mostly likely less than \$100.¹⁹⁴ The Board further explains that there is a variation in the cost of an SPD because the 2020 NEC does not mandate a uniform device for all homes. The 2020 NEC recognizes the size of the SPD will vary depending on the size and type of the electrical system in a home and so it uses performance-based criteria instead of mandating any particular device. Therefore, it is possible for an SPD to cost approximately \$200, but that is highly unlikely for most electrical systems found in average-sized homes.¹⁹⁵

163. The Board believes that the cost to install or replace an SPD is minimal when compared to its cost savings, as well as the safety benefits of protecting electrical systems and devices in the home. The SPD can prevent hundreds or often thousands of dollars of damage to electronic equipment and devices, including damage to electrical systems and devices that provide life safety benefits. For example, GFCIs and AFCIs can be damaged by transient surges and as a result will no longer function properly and protect against the hazards of electricity. Smoke alarms and carbon monoxide alarms are "hard-wired" to the dwelling's electrical system and transient voltage can damage these alarms, so they no longer alert occupants of the hazards of

¹⁸⁹ *Id.* at 132.

¹⁹⁰ *Id.* at 25.

¹⁹¹ *Id.* at 26.

¹⁹² Board's Preliminary Response to Comments at 19 (Sept. 8, 2020); Tr. at 41.

¹⁹³ Board's Preliminary Response to Comments at 20 (Sept. 8, 2020).

¹⁹⁴ See *id.* at 70, 135; see also Ex. K.10, reproduced in the Board's Part 1400.2220 Exhibits for Proposed Rule Hearing and Record.

¹⁹⁵ Board's Preliminary Response to Comments at 20 (Sept. 8, 2020).

smoke or carbon monoxide. Accordingly, the Board believes that this requirement is both needed and reasonable.¹⁹⁶

164. The Administrative Law Judge finds that the Board considered the costs and benefits of requiring surge protection devices. The Board, after weighing various positions and considerations, made a reasoned decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

G. 2020 NEC Section 230.85 Emergency Disconnect, Dwellings

165. The requirement of this section of the 2020 NEC is for an exterior emergency disconnect.

166. HFM proposed retaining the 2017 NEC language, which would require only homes with solar photovoltaic systems to have an emergency exterior disconnect.¹⁹⁷ HFM and its commenting members are concerned that expanding the exterior disconnect requirement has the potential for misuse and vandalism. HFM is also concerned that any misuse of an emergency exterior disconnect will result in costly damage during the winter months or when there is water in the basement in homes reliant on sump pumps. HFM argues that the negative outcomes to the homeowner far outweigh the benefit, as the vast majority of the devices required will never be used.¹⁹⁸

167. Grace Keliher recommended deleting the exterior disconnect requirement in its entirety. She notes that these devices are common in other states and a means of complying with the requirement in other parts of the country would be installing a meter main housing, which includes the main circuit breaker along with the meter socket, on the exterior of the home where the service drop is located. Because of this, a second main circuit breaker is allegedly unnecessary in the electrical panel within the home. She concludes that this requirement is not necessary in jurisdictions where the fire service has made other arrangements and that the emergency disconnect will not eliminate the hazards posed by electricity in every instance because backup generators and photovoltaic systems provide power after the electrical utility is disconnected.¹⁹⁹

168. At the hearing, Tony Wiener stated that customers for his homes were concerned over the exterior disconnect because a burglar or youthful vandals might cut power to a dwelling.²⁰⁰

169. At the hearing, Dick Johnson expressed concerns especially about the use of these disconnects in metropolitan areas where the device might be disconnected by unobserved youth.²⁰¹

¹⁹⁶ *Id.*

¹⁹⁷ Ex. I at 000203-204.

¹⁹⁸ *Id.*

¹⁹⁹ Grace Keliher's August 17, 2020, post-hearing written comments.

²⁰⁰ Tr. at 80.

170. Angie Wiese commented on this section that it is a first responder issue and noted the dangers that firefighters encounter when cutting into roofs and walls or when spraying water into open electrical wire and systems.²⁰²

171. The Board agrees with Ms. Wiese that the 2020 NEC emergency disconnect requirement is reasonable and needed for the protection of first responders or anyone entering a burning home. Emergency disconnects are necessary in order to shut down power to the home in the event of a fire.²⁰³

172. In response to the suggested alternatives, the Board stated that electrical meters are not designed or intended for the *disconnection* of electrical services and to do so from the electrical meter can be extremely dangerous for first responders. Moreover, the suggestion of locating the combination meter/main circuit breaker enclosure on the exterior of the dwelling where the service is located is already permitted in the 2017 NEC and would merely eliminate the need for a main circuit breaker in the branch circuit panelboard on the interior of the dwelling. The dwelling would still be equipped with an emergency disconnect on the exterior. The suggestion that fire services may have other methods for disconnect does not provide sufficient detail as to what these other methods may be. Furthermore, the emergency disconnect was proposed and is supported by the fire services community as the best and safest option to protect first responders and others.²⁰⁴

173. The Board acknowledged the concerns about vandalism and shutdown of the power to the dwelling by those with malicious intent. However, the Board noted that emergency disconnects are common in Greater Minnesota and yet it is unaware of any vandalism issues. The Board further noted that the disconnect could be locked in the on position and the disconnect itself is located in a combination meter/main circuit breaker enclosure that can be mechanically locked to provide an additional deterrent against vandalism.²⁰⁵

174. The Administrative Law Judge finds that the Board considered the costs and benefits of requiring emergency disconnects including the benefits to the safety of first responders, the risks of vandalism and the precautions in place to limit mischief. The Board, after weighing various positions and considerations, made a reasoned decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

²⁰¹ *Id.* at 132.

²⁰² *Id.* at 101.

²⁰³ Board's Preliminary Response to Comments at 20 (Sept. 8, 2020).

²⁰⁴ *Id.*

²⁰⁵ Board's Preliminary Response to Comments at 20 (Sept. 8, 2020); Tr. at 46, 135.

H. 2020 NEC Section 314.27(C): Boxes at Ceiling Suspended Paddle Fan Outlets

175. The 2020 NEC provision at issue regarding ceiling fan “boxes” states in its entirety:

Outlet boxes or outlet box systems used as the sole support of a ceiling-suspended (paddle) fan shall be listed, shall be marked by their manufacturer as suitable for this purpose, and shall not support ceiling-suspended (paddle) fans that weigh more than 32 kg (70 lb). For outlet boxes or outlet box systems designed to support ceiling-suspended (paddle) fans that weigh more than 16 kg (35 lb), the required marking shall include the maximum weight to be supported.

Outlet boxes mounted in the ceilings of habitable rooms of dwelling occupancies in a location acceptable for the installation of a ceiling-suspended (paddle) fan shall comply with one of the following:

- (1) Listed for the sole support of ceiling-suspended (paddle) fans
- (2) An outlet box complying with the applicable requirements of 314.27 and providing access to structural framing capable of supporting of a ceiling-suspended (paddle) fan bracket or equivalent.²⁰⁶

176. The Board states that paddle fan rated boxes house electrical wire connections as well as provide support for a ceiling paddle fan. A ceiling paddle fan weighs more than a typical light fixture and is subject to vibrations that a box used for a generic light fixture cannot support. Prior to the 2011 NEC, outlet boxes for ceiling mounted light fixtures in newly built homes included spare conductors to allow for the eventual installation of the ceiling paddle fan by the homeowner. These spare conductors were necessary because a switch was needed for the fan and a separate switch for the light. However, the homeowner was typically unaware the outlet box supporting the light fixture could not also support a ceiling paddle fan. The unsuspecting homeowner would then install a ceiling paddle fan that could fall and injure a family member or guest.²⁰⁷

177. Beginning in 2011, the NEC required that all outlet boxes intended for ceiling paddle fans that came with spare conductors be able to support a ceiling paddle fan. The requirement only applied to boxes with spare conductors because those conductors, which allowed there to be a switch for both the fan and the light, were needed to install ceiling paddle fans. The 2020 NEC was revised, however, because of advances in technology that allow many new fans to operate via remote control, meaning that additional wires are not necessary. This means that, without a change in

²⁰⁶ 2020 NEC Section 314.27(C).

²⁰⁷ Board’s Preliminary Response to Comments at 22 (Sept. 8, 2020); Tr. at 47.

the NEC, homeowners may think that a ceiling box in which there are not additional wires is appropriate for installation of one of these remote-controlled fans, even though, in actuality, it cannot support the weight of that fan.

178. HFM argues that, throughout the various building codes adopted in Minnesota, the practice is to require permitting for the use at the time and not permitting for future use. This practice avoids adding cost to the home for a situation that may never occur. HFM concedes that the cost may be minimal but states that there are labor costs for the framing and drywall trades that will be impacted by this change and increase the costs of homes. HFM is also concerned with the impact of requiring support boxes in the ceiling when combined with other new requirements that can result in additional outlets for island and peninsular countertops in kitchen work areas.²⁰⁸

179. The Board explains that the requirements for ceiling paddle fans in the 2020 NEC were revised to continue to ensure that homeowners and their families were protected from the hazards of unsupported ceiling paddle fans. The 2020 NEC does not require outlet boxes in the ceilings of habitable rooms to be able to support a ceiling paddle fan, but instead allows for either an outlet box listed for the sole support of the ceiling paddle fan or securing a standard outlet box to an existing structural member or brace between two structural members that can support the weight of a ceiling paddle fan.²⁰⁹

180. The Board also explains that it does not agree that a revision of existing safety provision due to technological advances is contrary to the intent of the electrical code. The Board argues that the NEC is subject to revision on a three-year cycle in order to address such changes in technology and building practices so in that the level of safety provided by the 2011 NEC is maintained in the 2020 NEC. The Board asserts that the flexibility allowed by the 2020 NEC should not result in an increase of drywall or framing costs while maintaining the expected level of safety for homeowners and their families. Finally, given the flexibility in design, material, and compliance provided by the 2020 NEC, the Board is unconvinced the provisions of this section make it more difficult to comply with the peninsular and island receptacle outlet requirements.²¹⁰

181. The Board believes that the support requirements for ceiling suspended paddle fan outlets to protect the inhabitants of a residential dwelling is both needed and reasonable.²¹¹

182. The Administrative Law Judge finds that the Board considered the costs and benefits of requiring support for a ceiling paddle fan by requiring a box intended to support such a fan. The Board, after weighing various positions and considerations, made a reasoned decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

²⁰⁸ Ex. I at 000203-204.

²⁰⁹ Board's Preliminary Response to Comments at 23 (Sept. 8, 2020); Tr. at 49.

²¹⁰ Board's Preliminary Response to Comments at 23 (Sept. 8, 2020).

²¹¹ *Id.*

I. 2020 NEC Section 406.4(D)(4): Arc-Fault Circuit-Interrupter Protection Replacement

183. Housing First and other Commenters proposed amending this section for consistency with its recommended amendment to section 210.12 to eliminate AFCI protection in kitchens and laundry rooms.²¹²

184. Thus, this proposed amendment is not separate from the discussion of section 210.12, but rather a part of that analysis. The Board responds by referencing the broader discussion of AFCIs, and states that it believes that AFCI technology provides the necessary protection from arc faults in kitchen and laundry spaces that use more electricity than many other spaces in the home and that contain combustible materials as well.²¹³

185. As discussed above in Section D, the Administrative Law Judge finds that the Board considered the costs and benefits of requiring AFCI protection. The Board, after weighing various positions and considerations, made a reasoned decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

J. 2020 NEC Section 406.9(C): Receptacles in Bathtub and Shower Space

186. Section 406.9(C) of the 2020 NEC does not permit receptacles within a zone measuring 3 feet horizontally and 8 feet vertically from the top of the bathtub rim or shower stall threshold, including the space directly over the tub or shower stall. An exception is provided for small bathrooms that do not meet the space thresholds. For these small bathrooms, receptacle outlets are permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.²¹⁴

187. Housing First proposed amending this section to retain the requirements for receptacle placement from the 2017 NEC. Housing First argues that homeowners want an easily accessible receptacle in their bathrooms and the NEC has long recognized this fact.²¹⁵

188. Grace Keliher also proposed retaining the 2017 NEC requirements that only prohibit the installation of receptacles within or directly over a bathtub or shower stall while maintaining the 2020 NEC exception that allows the receptacle “to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.”²¹⁶ She suggested that this change is necessary because the 2020 NEC

²¹² Housing First’s April 13, 2020, pre-hearing written comments.

²¹³ Board’s Preliminary Response to Comments at 23 (Sept. 8, 2020).

²¹⁴ Tr. at 53-54.

²¹⁵ Housing First’s April 13, 2020, pre-hearing written comments.

²¹⁶ Grace Keliher’s August 17, 2020, post-hearing written comments.

language “will cause non-uniform enforcement” and cited a lack of clarity in the language as to what is meant by “3 feet from the bathtub rim” and whether that is intended to mean 3 feet in every direction from the rim of the tub. Ms. Keliher was concerned that the language will prohibit “a receptacle from being installed within that zone even if there is a wall separating the end of the bathtub from the vanity. A receptacle is even more likely to be prohibited where a fixed glass panel separates the tub or shower from the area where a homeowner would like a receptacle.”²¹⁷

189. Angie Wiese testified in support of adopting the 2020 NEC in full without amendment. She stated “that the code is very clear that convenience can still be achieved while providing for safety” and “3 feet is a very reasonable number to work with to provide for the safety of occupants with regard to being in the bath or shower in close proximity to electronics.”²¹⁸

190. The Board argues that the 2017 NEC stated that the receptacle outlets were not permitted to be installed within or directly over the bathtub or shower stall. According to the Board, this language was less clear as to what encompasses the area of the bathtub or shower stall and whether it was the shell of the bathtub or shower stall or the walls enclosing the tub or shower. The Board believes that the revision in the 2020 NEC to define bathtub and shower stall areas will result in more uniform enforcement and application of the electrical code and is therefore needed and reasonable.²¹⁹

191. The Administrative Law Judge finds that the Board considered the costs and benefits of the bathtub and shower receptacle placement provisions of the 2020 NEC. The Board, after weighing various positions and considerations, made a reasoned decision to adopt the provision as contained in the 2020 NEC. The rule is needed and reasonable as those terms are used in the Administrative Procedure Act.

Based upon the Findings of Fact and the contents of the rulemaking record, the Administrative Law Judge makes the following:

CONCLUSIONS

1. The Department has demonstrated its statutory authority to adopt the proposed rules.
2. The Notice of Hearing complied with Minn. R. 1400.2080, subp. 5.
3. The Department gave notice to interested persons in this matter.
4. The Department has fulfilled its additional notice requirements.

²¹⁷ *Id.*

²¹⁸ Tr. at 101.

²¹⁹ Board’s Preliminary Response to Comments at 24 (Sept. 8, 2020).

5. The Department has fulfilled the procedural requirements of Minn. Stat. §§ 14.05, subd. 1, .14, .15, subd. 3, and .50 (i) and (ii).

6. The Department has fulfilled the procedural requirements of law or rule.

7. The Department has demonstrated the need for and reasonableness of the proposed rules by an affirmative presentation of facts in the record within the meaning of Minn. Stat. §§ 14.14 and 14.50.

Based upon the foregoing Conclusions, the Administrative Law Judge makes the following:

RECOMMENDATION

IT IS HEREBY RECOMMENDED that the proposed amended rules be adopted.

Dated: October 14, 2020



BARABARA J. CASE
Administrative Law Judge

Reported: One Transcript, Shaddix & Associates

NOTICE

This Report must be available for review to all affected individuals upon request for at least five working days before the agency takes any further action on the rules. The agency may then adopt the final rules or modify or withdraw its proposed rule. If the agency makes any changes in the rule, it must submit the rule to the Chief Administrative Law Judge for a review of the changes prior to final adoption. Upon adoption of a final rule, the agency must submit a copy of the Order Adopting Rules to the Chief Administrative Law Judge. After the rule's adoption, the OAH will file certified copies of the rules with the Secretary of State. At that time, the agency must give notice to all persons who requested to be informed when the rule is adopted and filed with the Secretary of State.