TEXT OF FINAL RULE

SECTION 1. PSC 114.001 (3) is amended to read:

(3) AVAILABILITY OF STATE ELECTRICAL CODE. The commission has adopted the ~~2012~~ 2017 edition of the National Electrical Safety Code (~~NESC-2012~~ NESC-2017) with certain deletions, changes and additions which are found in Volume 1, Wisconsin State Electrical Code. Copies of the NESC may be purchased from the Institute of Electrical and Electronics Engineers, Inc., IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331 (telephone 1-800-678-IEEE) or the American National Standards Institute, 1430 Broadway, New York, NY 10018 (telephone 212/642-4900). Copies of the NESC may be ordered online at http://standards.ieee.org/nesc. Copies of Volume 1, Wisconsin State Electrical Code, may be ordered from the Wisconsin Department of Administration, Document Sales, 202 S. Thornton Avenue, Madison, WI 53702 (telephone 608/266-3358). Unofficial copies of the rules can be obtained online at http://docs.legis.wi.gov/code/admin_code/psc/114/.

SECTION 2. PSC 114.002 (2) (d) is amended to read:

(d) This chapter does not apply to installations in mines, ships, railway rolling equipment, aircraft or automotive equipment, or utilization wiring except as covered in Parts 1 and 3, ~~NESC2012~~ NESC-2017.

SECTION 3. PSC 114.006 (1) and (2) are amended to read:

(1) ADOPTION OF STANDARD. The National Electrical Safety ~~Code-2012~~ Code-2017 edition (also American National Standards Institute ~~C2-2012~~ C2-2017 edition) subject to omissions, changes and additions as otherwise shown in this chapter, is hereby incorporated by reference into the Wisconsin State Electrical Code, Volume 1. Interim amendments to the ~~NESC-2012~~ NESC-2017 will not be effective in this state until such time as this chapter is revised to reflect such changes.

(2) CONSENT TO INCORPORATE ~~NESC-2012~~ NESC-2017 BY REFERENCE. Pursuant to s. 227.21, Stats., the attorney general has consented to the incorporation by reference of these standards contained in the ~~NESC-2012~~ NESC-2017, except for the omissions, changes and additions as shown later in this chapter. Copies of the ~~NESC-2012~~ NESC-2017 are on file in the offices of the commission and the legislative reference bureau.

SECTION 4. Chapter PSC 114 Subchapter III is amended to read:

Subchapter III – Omissions, Changes or Additions to ~~NESC-2012~~ NESC-2017

SECTION 5. PSC 114.007 (intro.) and PSC 114.007 Notes are amended to read:

PSC 114.007 Omissions, changes, additions to ~~NESC-2012~~ NESC-2017. Omissions, changes or additions to the ~~NESC-2012~~ NESC-2017 are specified in this subchapter and are rules of the commission and not requirements of the ~~NESC-2012~~ NESC-2017.

Note 1: Each omission, change or addition is found in the same location in this subchapter as the appropriate NESC part, section or subsection where the affected rule is found. Each change or addition has been prefixed by ch. PSC 114. Following the PSC designation is the referenced NESC section or subsection and the page on which it is found in the NESC. Example: PSC 114.096C [NESC 096C, p. ~~32~~ 34]. The word "Change" following the section number and heading means that the corresponding wording of the ~~NESC-2012~~ NESC-2017 has been changed and that the new wording is substituted at the appropriate location. The word "Addition" following the section number and heading means that a new requirement is incorporated in the ~~NESC-2012~~ NESC-2017 and that the new requirement is inserted at the appropriate location.

Note 2: To observe federal directives and recommendations that national standards adopt the metric system for units of measure, the numerical values of the ~~NESC-2012~~ NESC-2017 are stated in the metric system and in the customary inch-foot-pound system. To conform to this more international convention, this revision of the Wisconsin State Electrical Code, Volume 1 also adopts the same measurement convention. In the text, the metric value is now shown first with the customary inch-foot-pound value (in parentheses) following. In tables, the metric values are also given first and where the entire tables are duplicated, the table of metric values appears first with the table of inch-foot-pound values following.

SECTION 6. PSC 114.010 is amended to read:

PSC 114.010 Omissions. [NESC 010 through 016, pp. 1-6] Introduction to the National Electrical Safety Code (Section 1) (Omission) Rules 010 through 016 of the ~~NESC-2012~~ NESC-2017 are omitted and not incorporated as part of the Wisconsin State Electrical Code, Volume 1.

SECTION 7. PSC 114.02 (intro.), (1) and (2) are amended to read:

PSC 114.02 Definitions of special terms. ~~[NESC Section 2, p. 7]~~ ~~(Change and Addition).~~

(1) ADMINISTRATIVE AUTHORITY. [NESC Section 2., p. 7] (Change) Change the definition of "Administrative Authority" to read:

~~(a)~~ *Administrative authority*. The authority for the enforcement of this code is vested in the commission with respect to the installation and operation of circuits or equipment by public utilities and railroads in the exercise of their functions as utilities and railroads.

(2) COMMISSION. [NESC Section 2, p. 8] (Addition) Add the following definition:

~~(a)~~ *Commission*. Public service commission of Wisconsin.

SECTION 8. PSC 114.092 (title), (1) (intro.) and (2) (intro.) are amended to read:

PSC 114.092 Point of connection of grounding ~~connector~~ conductor.

(1) CABLE WITH INSULATING JACKET. [NESC 092B2b(3), p. ~~23~~ 25] (Change) Change paragraph (3) to read:

(2) CURRENT IN GROUNDING CONDUCTOR. [NESC 092D, p. ~~24~~ 26] (Change) Change paragraph D to read:

SECTION 9. PSC 114.094 is amended to read:

PSC 114.094 Grounding electrodes. [~~NESC 094B4 p. 29~~ NESC 094B3 p. 32] (Omission) ~~**(1)**~~ Rule ~~094B4~~ 094B3 of the ~~NESC-2012~~ NESC-2017 is omitted and not incorporated as part of the Wisconsin State Electrical Code, Volume 1.

SECTION 10. PSC 114.096 (intro.) and PSC 114.096 Exception 2 are amended to read:

PSC 114.096 ~~Multi-grounded systems~~ Ground resistance requirements. [NESC 096C, p. ~~32~~ 34] (Change) Change paragraph C to read:

Exception 2: Where underwater crossings are encountered, the requirements of made electrodes do not apply for the underwater portion if the neutral is of sufficient size and capacity for the duty involved and the requirements of Rule ~~92B2~~ 092B2 are met.

SECTION 11. PSC 114.097 (intro.), (1) (intro.) and (2) (intro.) are amended to read:

PSC 114.097 Separation of grounding conductors. ~~[NESC 097C, p. 32]~~ ~~(Changes)~~

(1) ~~Change paragraph~~ PARAGRAPH C. [NESC 097C, p. 35] (Changes) Change paragraph C to read:

(2) UNDERGROUND OR SINGLE-GROUNDED SYSTEMS AND MULTI-GROUNDED SYSTEMS. [NESC 097D, p. 35] (Change) Change paragraph D to read:

SECTION 12. PSC 114.099 (intro.), (1) (intro.), (2) and (3) (intro.) are amended to read:

PSC 114.099 Additional requirements for grounding and bonding of communication apparatus. ~~[NESC 099, p. 33] (Change and Addition)~~

(1) ADDITIONAL REQUIREMENTS FOR GROUNDING AND BONDING OF COMMUNICATION APPARATUS. [NESC 099, p. 36] (Change) Change title ~~099~~ to read:

(2) BONDING OF ELECTRODES. [NESC 099C, p.37] (Change) Change paragraph C to read:

C. Bonding of electrodes

A bond not smaller than AWG No. 6 copper or equivalent shall be placed between the communication grounding electrode and the supply system neutral grounding electrode where separate electrodes are used at the structure or building being served. All separate electrodes

shall be bonded together except where separation is required per Rule ~~97~~ 097. Bonding to other systems shall not be done on or within a metering enclosure unless a means of bonding, intended for inter-system bonding, is furnished as part of the metering enclosure.

Recommendation: If water piping is used as a bonding means, care must be taken to assure that the metallic path is continuous between electrodes.

(3) TRANSMISSION SHIELD WIRE SYSTEMS AND TRANSMISSION SYSTEMS WITH UNDER-BUILT MULTI-GROUNDED DISTRIBUTION SYSTEMS. ~~(Addition)~~ [Follows NESC 099C, p. ~~34~~ 37] (Addition) Following NESC 099C, ~~Add~~ add paragraph D to read:

SECTION 13. Part 1 (follows PSC 114.099) is created to read:

Part 1. Safety Rules for the Installation and Maintenance of Electric Supply Stations and Equipment

Section 10. Purpose and Scope of Rules

SECTION 14. PSC 114.102 is created to read:

PSC 114.102 Application of rules. [NESC 102, p. 39] (Change) Change paragraph 102 to read:

102. Application of rules

The general requirements for application of these rules are contained in s. PSC 114.005.

SECTION 15. PSC 114.103 is created to read:

PSC 114.103 Referenced sections. [NESC 103, p. 39] (Change) Change paragraph 103 to read:

103. Referenced sections

The Introduction (Section 1) as amended by s. PSC 114.010, Definitions (Section 2) as amended by Section 2 of Chapter PSC 114, List of Referenced Documents (Section 3) and Grounding Methods (Section 9) as amended by Section 9 of Chapter PSC 114 shall apply to the requirements of Part 1.

SECTION 16. PSC 114.114 is created to read:

PSC 114.114 Fire-extinguishing equipment. [Follows NESC 113, p. 46] (Addition) Following NESC 113 add paragraph 114 to read:

114. Fire-extinguishing equipment

Portable or permanent fire-extinguishing equipment approved for the intended use shall be conveniently located inside control buildings or similar buildings and conspicuously marked.

Exception: This rule does not apply to unmanned, outdoor substations that do not contain a control building or similar building. This rule is not intended to require permanently installed fire extinguishers or fire extinguishment system in all electric supply stations or in all areas of large, complex stations.

SECTION 17. PSC 114.202 is amended to read:

PSC 114.202 Application of rules. [NESC 202, p. ~~73~~ 77] (Change) Change the paragraph 202 to read:

202. Application of rules

The general requirements for application of these rules are contained in s. PSC 114.005. However, when a structure is replaced, arrangement of equipment shall conform to the ~~2012~~ 2017 Edition of Rule 238C.

SECTION 18. PSC 114.210 (intro.) is amended to read:

PSC 114.210 Referenced sections. [NESC 210, p. ~~74~~ 78] (Change) Change paragraph 210 to read:

SECTION 19. PSC 114.215 is repealed and recreated to read:

PSC 114.215 Grounding of circuits, supporting structures, and equipment. [NESC 215C1, p. 80] (Addition) Following NESC 215C1 Exception 3, add Exception 4 to read:

Exception 4: This requirement does not apply to supply cables meeting Rule 230C3 or communication cables.

SECTION 20. PSC 114.219 is amended to read:

PSC 114.219 Marking of poles and structures carrying high voltage supply lines. [Follows NESC 218, p. ~~79~~ 84] (Addition) ~~Add the following~~ Following NESC 218, add section 219 to read:

219. Marking of poles and structures carrying high voltage supply lines

~~(1)~~ A. Every corporation, company or person constructing, operating or maintaining an electric transmission line with a voltage of 2,000 or more between conductors and the ground shall place warning signs from 1.2 to 2.45 m (4 to 8 ft) above the ground upon all poles or other structures supporting the line.

Exception: Existing poles and structures which were required to be signed by s. 196.67, stats. and were installed prior to January 1, 1995, are permitted to comply with the warning sign requirements which existed on December 31, 1994.

~~(2)~~ B. Warning signs installed as replacements or new facilities on overhead electrical supply line poles and structures shall comply with the following standards:

~~(a)~~ 1. Warning signs which meet the requirements as to format and color of American National Standards Institute standard ANSI Z535.2-2011 for safety signs.

~~(b)~~ 2. The overall dimensions of these signs shall not be less than 25.4 cm by 17.78 cm (10 in by 7 in) except that in those situations where use of a sign this size is not practical, two or more signs not smaller than 17.78 cm by 12.7 cm (7 in by 5 in) may be substituted.

Exception: Existing poles and structures installed prior to July 1, 2003, are permitted to continue to use the "Danger - High Voltage" sign format meeting the requirements of the prior rule until such signs are replaced.

SECTION 21. Chapter PSC 114 Section 23 note is amended to read:

Note: The specification of clearances in Rules 232, 233, and 234, first adopted in the NESC-1990, and continued in the 1997 edition of the NESC adopted herein, have been revised in both concept and content to reflect the new Uniform System of Clearances approach which is described in Appendix A of NESC-1990, NESC-1993, NESC-1997, NESC-2002, NESC-2007, ~~and~~ NESC-2012 and NESC-2017. Because the approach and the application of the rules have been revised, it must be understood that clearance values of editions of the national and state codes prior to 1990 cannot be directly compared to those of editions of the codes after 1990. See Appendix A of NESC-1990, NESC-1993, NESC-1997, NESC-2002, ~~and~~ NESC-2007, ~~or~~ NESC-2012, or NESC-2017.

SECTION 22. PSC 114.230 (title), (1) and (2) (intro.) are amended to read:

PSC 114.230 ~~Clearances~~ General.

(1) ~~CLEARANCES~~ APPLICATION. [NESC ~~230A(1)~~ 230A1 and ~~230A(2)~~ 230A2, p. ~~85~~ 90] (Omission) Rules ~~230A(1)~~ 230A1 and ~~230A(2)~~ 230A2 of the ~~NESC-2012~~ NESC-2017 are omitted and not incorporated as part of the Wisconsin State Electrical Code, Volume 1.

(2) MAINTENANCE OF CLEARANCES AND SPACINGS. [NESC 230I, p. ~~89~~ 94] (Change) Change the Note in paragraph I to read:

SECTION 23. PSC 114.231 is created to read:

PSC 114.231 Clearance of supporting structures from other objects. [NESC 231B1, p. 96] (Change) Change paragraph 1 to read:

1. Where there are curbs: supporting structures, support arms, anchor guys, or equipment attached thereto, up to 4.6 m (15 ft) above the road surface shall be located a sufficient distance behind the curb to avoid contact by ordinary vehicles using and located on the traveled way. For a redirectional curb, such distance shall be not less than 150 mm (6 in) from the street side of the curb.

SECTION 24. PSC 114.232 (1) (intro.), (1) (a) (intro.), (1) (b) (intro.) (1) (c), (1) (d), (1) (e) (intro.), (1) (f), (2) (intro.) and (3) (intro.) are amended to read:

(1) TABLE PSC 114.232-1. [NESC Table 232-1, pp. ~~94-97~~ 99-102: metric; pp. ~~97-100~~ 103-106: feet] ~~Vertical Clearance of Wires, Conductors and Cables above Ground, Rails, or Water Surfaces (Changes and Additions) The Footnotes for NESC Table 232-1 on page 96-97 (Metric) and page 99-100 (Feet) contain the following changes and additions:~~

(a) Footnote 18 [NESC, Table 232-1, p. 101: metric; p. 105 feet] Change Footnote 18 to read as follows:

(b) Footnote 21 [NESC, Table 232-1, p. 102 metric; p. 106: feet] Change Footnote 21 to read as follows:

(c) ~~Add Footnote 26 to read as follows:~~ Footnote 25 [NESC, Table 232-1, p. 102: metric; p. 106: feet] (Change) Change Footnote 25 to read as follows:

~~26~~ 25 Water areas not suitable for sailboating include portions of meandering rivers, streams and canals where the widest width does not exceed 50 m (165 feet) within any unobstructed,1.6-km (1-mile) long segment that includes the crossing or where the width does not exceed 50 m (165 feet) within the surface area of any segment less than 1.6-km (1-mile) long on the line-crossing side of an overwater obstruction. All rivers, streams, canals and creeks as defined by the Wisconsin department of natural resources (DNR) which meet this definition are considered not suitable for sailing.

(d) Footnote 25 [NESC, Table 232-1, p. 102: metric; p. 106: feet] (Addition) Add the reference to Footnote ~~26~~ 25 in the ~~in NESC-2012~~ NESC-2017 Table 232-1 (both the metric and feet sections) on ~~pp. 94-97 (Metric) and pp. 97-100 (Feet)~~ to the sailboating category titles of rows 6 and 7. It applies to all clearances in those rows.

(e) Footnote 27 [Follows NESC, Table 232-1 Footnote 26, p. 102: metric; p. 106: feet] (Addition) Following Footnote 26 for Table 232-1 (for both the metric and feet sections), ~~Add~~ add Footnote 27 which reads as follows:

(f) Footnote 27 [Follows NESC, Table 232-1 Footnote 26, p. 102: metric; p. 106: feet] (Addition) Add the reference to Footnote 27 in the Table 232-1 (both the metric and feet sections) ~~in NESC-2012 Table 232-1 on pp. 94-97 (Metric) and pp. 97-100 (Feet)~~ to the conductor category titles of columns 3, 4 and 5. It applies to all clearances in those columns.

(2) TABLE PSC 114.232-2. [NESC, Table 232-2, ~~pp. 101-102~~ p. 108 (metric) and ~~pp. 102-103~~ p. 111 (feet)] ~~Vertical Clearance of Equipment Cases, Support Arms, Platforms, Braces and Unguarded Rigid Live Parts Above Ground, Roadway, or Water Surfaces~~ (Change) Change Footnote 8 to read as follows:

(3) TABLE PSC 114.232-3. [NESC, Table 232-3, p. ~~104~~ 113] ~~Reference Heights~~ (Change) Change Footnote 3 to read:

SECTION 25. PSC 114.234 (1) (intro.), (2) (intro.), (3) (intro.), (4) (intro.), (5) (intro.) and (6) (intro.) are amended to read:

(1) ~~VERTICAL AND HORIZONTAL~~ CLEARANCES. [NESC 234C1a, p. ~~118~~ 128] (Change) Change paragraph (1) (a) to read:

(2) TRANSMISSION LINES OVER DWELLING UNITS. [Follows NESC 234C1b, p. ~~119~~ 128] (Addition) Following 234C1b, ~~Add~~ add the following paragraph c:

(3) ~~SUPPLY CONDUCTORS ATTACHED TO BUILDINGS OR OTHER INSTALLATIONS.~~ SERVICE-DROP CONDUCTORS, INCLUDING DRIP LOOPS SHALL HAVE CLEARANCE OF NOT LESS THAN THE FOLLOWING: [NESC 234C3d, p. ~~119~~ 129] (Change) Change Exception 2(a) to read:

(4) CLEARANCE OF LINES NEAR STORED MATERIALS. [Follows NESC 234C5, p. ~~120~~ 129] (Addition) Following 234C5, ~~Add~~ add the following paragraph 6 and note:

(5) CLEARANCE OF SUPPLY LINES NEAR FUEL STORAGE TANKS [Follows NESC 234C5, p. ~~120~~ 129] (Addition) Following NESC 234C5 and the PSC 114 addition of paragraph 6, ~~Add~~ add the following paragraph 7 and exceptions 1 and 2 to read:

(6) ~~CLEARANCE OF LINES NEAR WELLS~~ CLEARANCE OF OPEN SUPPLY LINES NEAR WELLS. [Follows NESC 234C5, p. ~~120~~ 129] (Addition) Following NESC 234C5 and PSC 114 additions of paragraph 6 and 7, ~~Add~~ add the following paragraph 8 and exception:

SECTION 26. PSC 114.234 (7) is repealed.

SECTION 27. PSC 114.234 (8) (intro.) and (9) (intro.) are amended to read:

(8) SWIMMING POOLS. [NESC 234E1, p. ~~121~~ 130] (Addition) Add the following sentence to the beginning of paragraph E1:

(9) GRAIN BINS LOADED BY PERMANENTLY INSTALLED AUGERS, CONVEYERS, OR ELEVATOR SYSTEMS. [Follows NESC 234F1, p. ~~122~~ 131] (Addition) Following 234F1, ~~Add Exception and Note~~ add exception and note to read:

SECTION 28. PSC 114.234 (10) is repealed and recreated to read:

(10) TABLE PSC 114.234-1. [NESC Table 234-l, pp. 141-145: metric]

(a) Table PSC 114.234-l [NESC Table 234-l, p. 141: metric] (Change) Change the following values in the NESC Table 234-1 (metric):

1. The value in Item (Row) 1.b.(1), Column 2 is revised from "0.90" to "2.45"

2. The value in Item (Row) 1.b.(1), Column 3 is revised from "1.07" to "2.45"

(b) Footnote 19 [Follows NESC Table 234-1 Footnote 18, p. 144: metric] (Addition) Following Footnote 18 for Table 234-1 (metric), add Footnote 19 to read:

[19]This clearance may be reduced to 0.90 m for supply conductors limited to 300 V to ground and communications conductors and cables if the roof has a slope of not less than 1 (vertical) to 3 (horizontal).

(c) Footnote 19 [NESC Table 234-1, p. 141: metric] (Addition) Add the reference for Footnote 19 to the values in Item (Row) 1.b.(1), Columns 2 and 3.

SECTION 29. PSC 114.234 (11), (12), and (13) are created to read:

(11) TABLE PSC 114.234-1. [NESC Table 234-1, pp. 145-148: feet]

(a) Table PSC 114.234-1 [NESC Table 234-1, p. 145: feet] (Change) Change the following values in the NESC Table 234-1 (feet):

1. The value in Item (Row) 1.b.(1), Column 2 is revised from "3.0" to "8.0."

2. The value in Item (Row) 1.b.(1), Column 3 is revised from "3.5" to "8.0."

(b) Footnote 19 [Follows NESC Table 234-1 Footnote 18, p. 148: feet] (Addition) Following Footnote 18 for Table 234-1 (feet), add Footnote 19 to read:

[19]This clearance may be reduced to 3 ft for supply conductors limited to 300 V to ground and communications conductors and cables if the roof has a slope of not less than 1 (vertical) to 3 (horizontal).

(c) Footnote 19 [NESC Table 234-1, p. 145: feet] (Addition) Add the reference for Footnote 19 to the values in Item (Row) 1.b.(1), Columns 2 and 3.

(12) TABLE PSC 114.234-6. [NESC Table 234-6, p. 156: metric]

(a) Table PSC ll4.234-6 [NESC Table 234-6, p. 156: metric] (Change) Change the following values from the NESC Table 234-6 (metric):

The value in the Items Row 4 (230C3, 230C2), Columns 6 and 7; Row 5 (230C1), Columns 6, 7 and 8; Row 6 (230D), Column 6; Row 7 (230C3, 230C2), Columns 3, 4, 6 and 7; Row 8 (230C1), Columns 3, 4, 5, 6, 7 and 8; Row 9 (230D), Columns 3 and 6 is revised from "0.90" to "2.45".

(b) Footnote 3 [Follows NESC Table 234-6 Footnote 2, p. 156: metric] (Addition) Following Footnote 2, add Footnote 3, which reads as follows:

[3]This clearance may be reduced to 0.90 m for supply conductors limited to 300 V to ground and communications conductors and cables if the roof has a slope of not less than 1 (vertical) to 3 (horizontal).

(c) Footnote 3 [NESC Table 234-6, p. 156: metric] (Addition) The reference to Footnote 3 is added to the values in Items Row 4 (230C3, 230C2), Columns 6 and 7; Row 5 (230C1), Columns 6 and 7; Row 6 (230D), Column 6; Row 7 (230C3, 230C2), Columns 3, 4, 6 and 7; Row 8 (230C1), Columns 3, 4, 6 and 7; Row 9 (230D), Columns 3 and 6.

(13) TABLE PSC 114.234-6. [NESC Table 234-6, p. 157: feet]
(a) Table PSC 114.234-6 [NESC Table 234-6, p. 157: feet] (Change) Change the following values from the NESC Table 234-6 (feet):

1. The value in the Items Row 4 (230C3, 230C2), Columns 6 and 7; Row 5 (230C1), Columns 6,
7 and 8; Row 6 (230D), Column 6; Row 7 (230C3, 230C2), Columns 3, 4, 6 and 7; Row 8 (230C1), Columns 3, 4, 5, 6, 7 and 8; Row 9 (230D), Columns 3 and 6 is revised from "3.0" to "8.0."

(b) Footnote 3 [Follows NESC Table 234-6 Footnote 2, p. 157: feet] (Addition) Following Footnote 2, add footnote 3, which reads as follows:

[3]This clearance may be reduced to 3 ft for supply conductors limited to 300 V to ground and communications conductors and cables if the roof has a slope of not less than 1 (vertical) to 3 (horizontal).

(c)Footnote 3 [NESC Table 234-6, p. 157: feet] (Addition) The reference to Footnote 3 is added to the value in Items Row 4 (230C3, 230C2), Columns 6 and 7; Row 5 (230C1), Columns 6 and 7; Row 6 (230D), Column 6; Row 7 (230C3, 230C2), Columns 3, 4, 6 and 7; Row 8 (230C1), Columns 3, 4, 6 and 7; Row 9 (230D), Columns 3 and 6.

SECTION 30. PSC 114.235 (intro.) is amended to read:

PSC 114.235 ~~Sag-related clearances~~ Clearance for wires, conductors, or cables carried on the same supporting structure. [~~Follows NESC 235C2b(1)(a)~~ NESC 235C2b(1)(b) Exception 2, p. ~~150~~ 162] (Change) Change Exception 2 to read:

SECTION 31. PSC 114.242 (intro.) is amended to read:

PSC 114.242 Grades of construction for conductors. [Follows NESC 242F, p. ~~187~~ 199] (Addition) Following NESC 242F, ~~Add~~ add the following paragraph G to read:

SECTION 32. PSC 114.250 (1) and (2) (intro.) are amended to read:

(1) EXTREME WIND LOADING. [Alternative to NESC 250C, p. ~~191~~ 203] As an alternate to NESC Tables 250-2 and Table 250-3, the following Table PSC 114.250-2 and the related definitions and formulas for k_Z and G_{RF} may be used. (NESC Figure 250-2(b) "Basic Wind Speeds" is a part of this rule by reference.)

C. Extreme wind loading

If no portion of a structure or its supported facilities exceeds 18 m (60 ft) above ground or water level, the provision of the rule are not required, except as specified in ~~Rule 261A.1.2.f.~~ Rule 261A1c, 261A2e, or 261A3d. Where a structure or its supported facilities exceeds 18 m (60 ft) above ground or water level, the structure and its supported facilities shall be designed to withstand the extreme wind load associated with the Base Wind Speed as specified by NESC Figure 250-2(b). The wind pressures calculated shall be applied to the entire structure and supported facilities without ice.

The following formula shall be used to calculate wind load.

Load in Newton = $0.613 \cdot (V_{m/s})^2 \cdot k_Z \cdot G_{RF} \cdot I \cdot C_d \cdot A(m^2)$

Load in pounds = $0.00256 \cdot (V_{mi/h})^2 \cdot k_Z \cdot G_{RF} \cdot I \cdot C_d \cdot A(ft^2)$

Where:

0.613 0.00256	Ambient Air Density Value, reflects the mass density of air for the standard atmosphere, i.e., temperature of 15ºC (59ºF) and average sea level pressure of 760 mm (29.92 in) of mercury. (No adjustment in the velocity to pressure coefficient has been made relative to changes in air density with altitude.) The dimensions associated with this coefficient are, for metric, 0.613 Ns^2/m^4; and, for English, 0.00256 $lbhr^2/mi^2 ft^2$.
kz	Velocity-Pressure Exposure Coefficient, as defined in Table PSC 114-250-2.
V	Basic wind speed, from NESC 250C, Figure 250-2 given in m/s at 10 m (mi/h at 33 ft) above ground;
G_{RF}	Gust Response Factor, as defined in Table PSC 114-250-2.
I	Importance factor equal to 1.0 for utility structures and their supported facilities,
C_d A	Shape Factor as defined as defined in NESC Rule 252B, Projected wind area, m^2 (ft^2).

Table PSC 114.250-2 (Metric)
Velocity Pressure Exposure Coefficient, k_Z Gust Response Factor, G_{RF}

	kz • GRF	
	For Structures:	For Wires:
For structures with a total height of 30 m or less above ground or water level	1.0	0.85
For structures with a total height exceeding 30 m above ground or water level	0.93+0.00245(h)	0.78+0.00245(h)

Table PSC 114.250-2 (English)
Velocity Pressure Exposure Coefficient, k_Z Gust Response Factor, G_{RF}

	kz • GRF	
	For Structures:	For Wires:
For structures with a total height of 100 ft or less above ground or water level	1.0	0.85
For structures with a total height exceeding 100 ft above ground or water level	0.93+0.00075(h)	0.78+0.00075(h)

Where:

h = height of the structure above ground or water level. For wind loads on wires attached to the structure, the height of the highest wire attachment above ground or water level may be used if less than the height of the structure. In unique terrain where the height of the wire above ground

at mid-span may be substantially higher than at the attachment point, engineering judgment may be used to determine an appropriate value the height of the wire.

Note: The height of all wire attachments should be based on the height of the highest attachment or total structure height. The formulas to determine $k_Z G_{RF}$ were based on this premise, not the height of each attachment.

The wind pressure parameters (k_Z, V, and G_{RF}) are based on open terrain with scattered obstructions (Exposure Category C as defined in ASCE 7-98). Exposure Category C is the basis of the NESC extreme wind criteria. Topographic features such as ridges, hills, and escarpments may increase the wind loads on site-specific structures. A topographic Factor, k_{zt}, from ASCE7-98 may be used to account for these special cases.

(2) LONGITUDINAL CAPABILITY. [Follows NESC 250D, p. ~~193~~ 205] (Addition) Following NESC 250 D, ~~Add~~ add the following paragraph E:

SECTION 33. PSC 114.253 (intro.) and (2) are amended to read:

PSC 114.253 Load factors for structures, cross arms, support hardware, guys, foundations, and anchors. [NESC Table 253-1, p. ~~212~~ 225] Load factors for structures[1], cross arms, support hardware, guys, foundations, and anchors to be used with the strength factors of Table 261-1. (Changes)

(2) ~~Change~~ Add Footnote ~~4~~ 9 to read:

~~4~~ 9For guys associated with structures supporting only supply conductors or supply conductors and communication conductors and cables, this factor may be reduced to 2.00. ~~This factor may be reduced to 1.75 for wood and reinforced (not prestressed) concrete structures when the span being supported is not at a crossing.~~

SECTION 34. PSC 114.253 (3) is created to read:

(3) The reference to Footnote 9 is added to the value located at Transverse loads, Wind for Grade C, At crossings.

SECTION 35. Chapter PSC 114 Section 26 is repealed.

SECTION 36. PSC 114.261 is repealed.

SECTION 37. PSC 114.302 (intro.) is amended to read:

PSC 114.302 Application of rules. [NESC 302, p. ~~233~~ 247] (Change) Change Rule 302 to read:

SECTION 38. PSC 114.310 (intro.) is amended to read:

PSC 114.310 Referenced sections. [NESC 310, p. ~~234~~ 248] (Change) Change Rule 310 to read:

SECTION 39. PSC 114.317 is amended to read:

PSC 114.317 Outdoor location of oil-insulated padmounted transformers near buildings. [Follows NESC 316, p. ~~236~~ 250] (Addition) Following NESC 316, ~~Add~~ add the following:

317. Outdoor location of oil-insulated padmounted transformers near buildings.

A. Noncombustible and Combustible Walls

For the purposes of this section, combustible walls are walls of Type No.V buildings as determined by Wisconsin Building Code (Construction Classification IBC Chapter 6). All other walls are considered to be non-combustible.

B. Noncombustible Walls

Padmounted oil-insulated transformers may be located directly next to noncombustible walls if the following clearances are maintained from doors, windows and other building openings.

1. Padmounted oil-insulated transformers shall not be located within a zone extending 6.1 m (20 ft) outward and 3.0 m (10 ft) to either side of a building door. See Figure PSC 114-317B1.

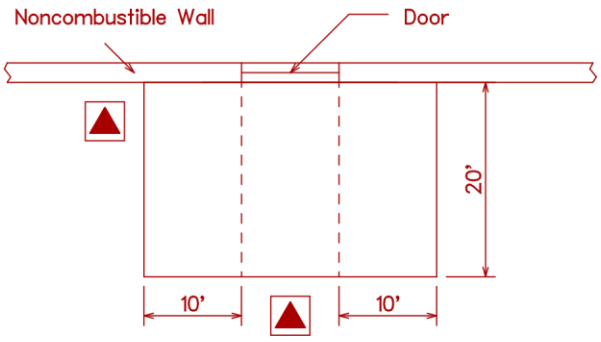

Figure PSC 114-317B1.

2. Padmounted oil-insulated transformers shall not be located within a zone extending 3.0 m (10 ft) outward and 3.0 m (10 ft) to either side of an air intake opening. Such transformers may be

located within said zone beneath an air intake opening provided there is not less than 7.6 m (25 ft) diagonal separation between the transformer and said opening. See Figure PSC 114-317B2.

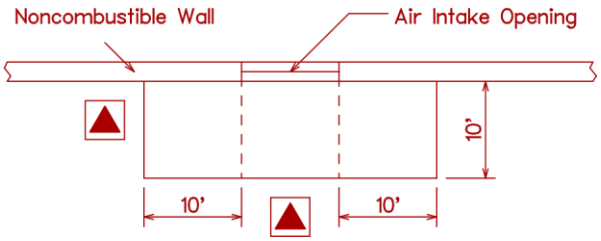

Figure PSC 114-317B2.

3.a. Padmounted oil-insulated transformers shall not be located within a zone extending 3.0 m (10 ft) outward and 0.9 m (3 ft) to either side of a building window or opening other than an air intake. See Figure PSC 114-317B3a.

Exception: This does not apply to a glass block or fire window meeting the requirements of the Wisconsin Commercial Building Code (Fire Window IBC Chapter 7, Section 714.3).

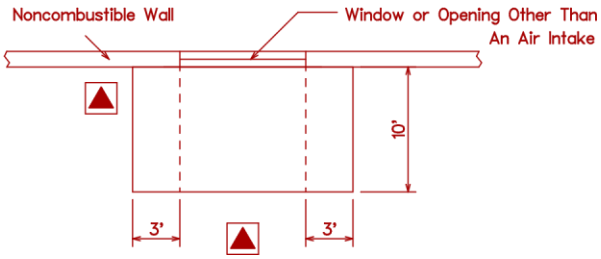

Figure PSC 114-317B3a.

3.b. For second story windows, the transformer shall not be located less than 1.5 m (5 ft) from any part of the window. See Figure PSC 317B3b.

Exception: This does not apply to a glass block or fire window meeting the requirements of the Wisconsin Commercial Building Code (Fire Window, IBC Chapter 7, Section 714.3).

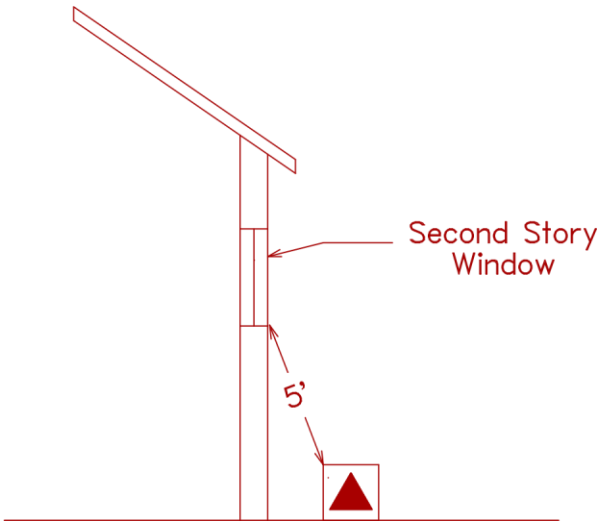

Figure PSC 114-317 B3b.

C. Combustible Walls

1. Padmounted oil-insulated transformers in sizes up to and including 100 kVA shall be located according to the provisions set forth in Subsection B for noncombustible walls.

2. Padmounted oil-insulated transformers in sizes above 100 kVA shall be located a minimum of 3.0 m (10 ft) from the building wall in addition to the clearances from building doors, windows and other openings set forth for noncombustible walls. ~~Also, a sump shall be installed for transformers in size exceeding 500 kVA if the immediate terrain is pitched toward the building.~~

D. Barriers

If the clearances specified in PSC 114.317 cannot be obtained, a fire-resistant barrier may be constructed in lieu of the required separation. The following methods of construction are acceptable:

1. Noncombustible Walls

The barrier shall extend to a projection line from the corner of the padmounted transformer to the furthest corner of the window, door or opening in question. The height of the barrier shall be 0.3 m (1 ft) above the top of the padmounted transformer. See Figure PSC 114-317D1.

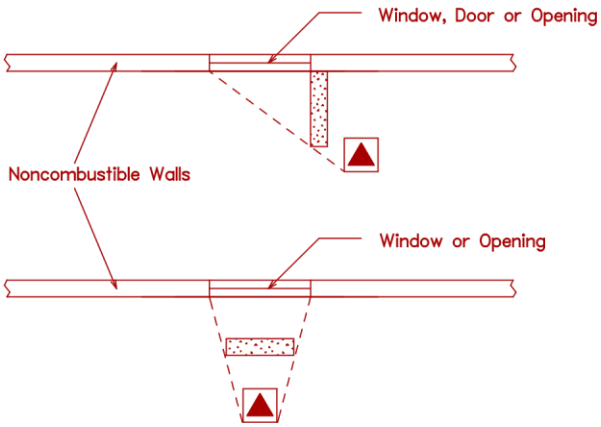

Figure PSC 114-317D1.

2. Combustible Walls

The barrier shall extend 0.9 m (3 ft) beyond each side of the padmounted transformer. The height of the barrier shall be 0.3 m (1 ft) above the top of the transformer. See Figure PSC 114-317D2.

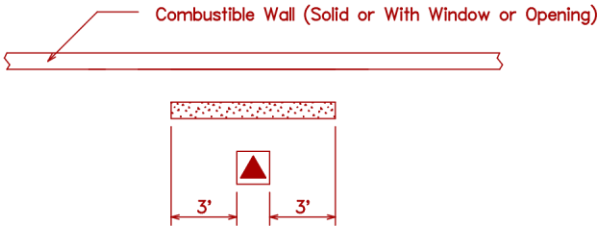

Figure PSC 114-317D2.

E. Fire Escapes

1. Padmounted oil-insulated transformers shall not be located within a zone extending 6.1 m (20 ft) outward and 3 m (10 ft) to either side of the point where a fire escape meets the ground. See Figure PSC 114-317E1.

2. Padmounted oil-insulated transformers located beneath fire escapes shall have a vertical clearance of not less than 3 m (10 ft) from the top of the transformer to the bottom of the fire escape. See Figure PSC 114-317E2.

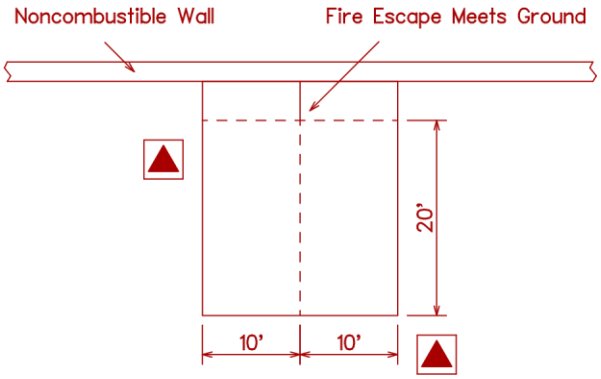

Figure PSC 114-317E1

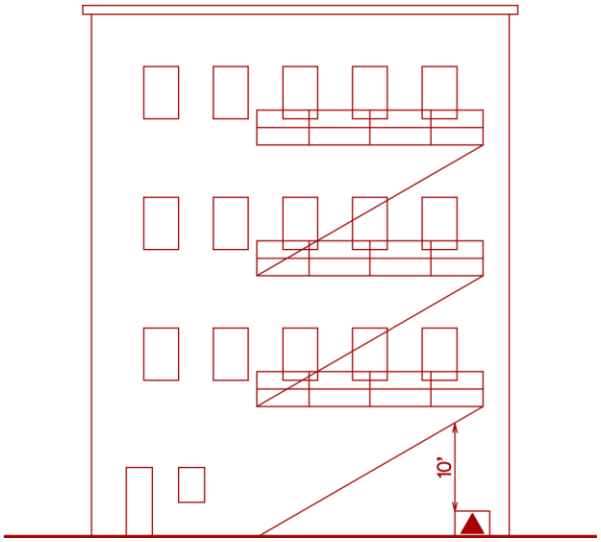

Figure PSC 114-317E2

SECTION 40. Chapter PSC 114 Section 32 is repealed.

SECTION 41. PSC 114.320 is repealed.

SECTION 42. PSC 114.323 is repealed.

SECTION 43. PSC 114.350 (intro.) is amended to read:

PSC 114.350 General. [NESC 350F, p. ~~248~~ 263] (Change) Change paragraph F to read:

SECTION 44. PSC 114.352 (intro.) is amended to read:

PSC 114.352 Installation. Table PSC 114.352-1 [NESC Table 352-1, p. ~~251~~ 266] Supply cable, conductor, or duct burial depth (Change and Addition)

SECTION 45. PSC 114.353 (intro.) is amended to read:
PSC 114.353 Deliberate separations—Equal to or greater than 300 mm (12 in) from underground structures or other cables. [Follows NESC 353D, p. ~~252~~ 267] (Addition)
Following NESC 353D, ~~Add~~ add the following paragraph E to read:

SECTION 46. PSC 114.354 is repealed and recreated to read:

PSC 114.354 Random separation – Separation less than 300 mm (12 in) from underground structures or other cables.

(1) SUPPLY AND COMMUNICATION CABLES OR CONDUCTORS [NESC 354D1g, p. 268] (Change)

Change paragraph g to read:

g. Adequate bonding shall be provided between the effectively grounded supply conductor or conductors and the communication cable shield or sheath at intervals that should not exceed 300 m (1,000 ft). At each above or below grade transformer or above or below grade pedestal, all existing grounds shall be interconnected. These include the primary neutral, secondary neutral, power cable shield, metal duct, or sheath and communication cable sheath. Communication protectors, communication service cable shields and secondary neutrals shall be connected to a common ground at each customer's service entrance when communication circuits are underground without separation from power conductors.

(2) INSULATING JACKETED EFFECTIVELY GROUNDED NEUTRAL SUPPLY CABLES. [NESC 354D3b Exception, p. 269] (Omission) The exception in Rule 354D3b of the NESC-2017 is omitted and not incorporated as part of the Wisconsin State Electrical Code, Volume 1.

(3) SUPPLY AND COMMUNICATION CABLES OR CONDUCTORS AND NON-METALLIC WATER AND SEWER LINES. [NESC 354E, p. 269] (Change) Change paragraph E to read:

E. Supply and communication cables or conductors, foundations and water and sewer lines.

1. Supply cables and conductors and water and sewer lines or foundations may be buried together with no deliberate separation between facilities and at the same depth, provided all parties involved are in agreement.

2. Communication cables and conductors and water and sewer lines or foundations may be buried together with no deliberate separation between facilities and at the same depth, provided all parties involved are in agreement.

3. Supply cables or conductors, communication cables or conductors, water and sewer lines or foundations may be buried together with no deliberate separation between facilities and at the same depth, provided the applicable rules in Rule 354D are met and all parties involved are in agreement.

SECTION 47. PSC 114.381 (intro.) is amended to read:
PSC 114.381 ~~Warning Signs~~ Design. [Follows NESC 381G, p. ~~257~~ 273] (Addition) Following NESC 381G, ~~Add~~ add paragraph H to read:

SECTION 48. Chapter PSC 114 Part 4 is amended to read:

Part 4. Work Rules for the Operation of Electric Supply and Communications Lines and Equipment

SECTION 49. PSC 114.402 (intro.) is amended to read:

PSC 114.402 Referenced sections. [NESC 402, p. ~~261~~ 277] (Change) Change first sentence of NESC Rule 402 to read:

SECTION 50. PSC 114.410 is amended to read:

PSC 114.410 General requirements. ~~[NESC 410A3 p. 262]~~ [Follows NESC 410A3b Note 5, p. 279] (Addition) Add the following clarifying note to Rule 410A3b:

~~Note 4~~ **Note** 6: It is the intent of this rule that the facility owner and equipment owner cooperate to provide the necessary arc assessment of their respective areas of responsibility where work is to be performed. Either the facility owner or the equipment owner may request the appropriate information from the other party and perform the assessment on behalf of the other.

SECTION 51. Effective date. This rule shall take effect on the first day of the month following publication in the Wisconsin Administrative Register as provided in Wis. Stat. § 227.22(2) (intro.).