

CR 84-213

File No. 2-U-5058.17

84-213

CERTIFICATE

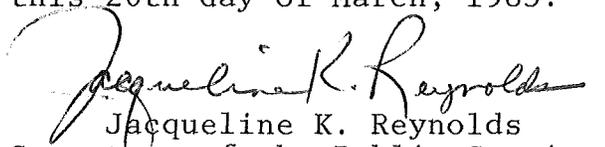
STATE OF WISCONSIN )  
 ) ss.  
PUBLIC SERVICE COMMISSION )

TO ALL WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Jacqueline K. Reynolds, Secretary of the Public Service Commission of Wisconsin, and custodian of the official records of said commission, do hereby certify that the annexed order amending Wis. Adm. Code section PSC 114 was duly approved and adopted by this commission on March 19, 1985.

I further certify that said copy has been compared by me with the original on file in this commission and that the same is a true copy thereof, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the commission at the Hill Farms State Office Building, in the City of Madison this 26th day of March, 1985.

  
Jacqueline K. Reynolds  
Secretary of the Public Service Commission of Wisconsin

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BEFORE THE  
PUBLIC SERVICE COMMISSION OF WISCONSIN

In the Matter of Proposed Amendment of )  
Chapter PSC 114, Wis. Adm. Code, as ) 2-U-5058.17  
Wisconsin State Electrical Code, )  
Volume 1 )

ORDER OF THE PUBLIC SERVICE COMMISSION  
AMENDING RULES

Relating to rules concerning electric safety--Amendment  
of Volume 1 of the Wisconsin State Electrical Code.

Analysis prepared by the Public Service Commission of  
Wisconsin.

ANALYSIS

On October 25, 1984, the Public Service Commission  
issued a notice of hearing on revisions to Volume 1 of the State  
Electrical Code. Volume 1, Wisconsin State Electrical Code, has  
been based on the National Electrical Safety Code (American  
National Standards Institute C2). In 1979 and 1982 the  
commission adopted the 1977 and 1981 editions of the code,  
respectively, with certain changes, deletions and additions.

The 1984 edition of the National Electrical Safety Code  
has now been issued, and the proposed PSC rules contain  
corresponding revisions. Volume 1 of the Wisconsin State  
Electrical Code is presently found in Chapter PSC 114, Wis. Adm.  
Code. The rules in Chapter PSC 114 will deal with safety  
requirements for the installation and maintenance of electrical  
facilities.

No fiscal impact is anticipated from this change in the electrical code, and no impact on small business.

PROPOSED RULES AND STATUTORY AUTHORITY

Pursuant to authority vested in the Public Service Commission of Wisconsin by § 196.47, 196.67 and 227.014(2)(a), Stats., the commission amends rules as follows:

Chapter PSC 114, Wis. Adm. Code, is amended as shown in the appendix.

This action is classified as a Type III action according to PSC 2.90(3), Wis. Adm. Code. No unusual circumstances have come to the attention of the commission that would require further environmental review. It consequently requires neither an environmental impact statement under s. 1.11, Stats., nor an environmental assessment.

These rules have been forwarded to the legislature for review pursuant to s. 227.018, Stats. They will take effect on the first day of the month following publication in the Wisconsin Administrative Register, as provided in s. 227.026, Stats.

Dated at Madison, Wisconsin,

March 19, 1985

By the Commission.

Jacqueline K. Reynolds  
Jacqueline K. Reynolds  
Secretary to the Commission

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## REPORT

### A.B. FINDINGS OF FACT; NEED FOR RULES.

As explained in the analysis, the State Electrical Code is updated every few years to incorporate newly issued technological changes.

### C. MODIFICATIONS AS A RESULT OF HEARING.

None.

### D. APPEARANCES AT THE HEARING.

None

### E. RESPONSE TO LEGISLATIVE COUNCIL REPORT.

All comments and suggestions of the Legislative Council related to editorial or nonsubstantive aspects of the rules. Most of these suggestions have been followed.

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SEC. 1: PSC Ch. 114 is amended as follows:

(Note: Table PSC 114-232-1, Table PSC 114-234-1, and Figure 114-234E1 are entirely repealed and recreated.)

CHAPTER PSC 114  
WISCONSIN STATE ELECTRICAL CODE, VOLUME 1

PSC 114.01 GENERAL INFORMATION. (1) ADMINISTRATIVE AUTHORITIES. The Wisconsin State Electrical Code is issued and administered by the public service commission and the department of industry, labor and human relations as part of the Wisconsin Administrative Code. The public service commission has primary responsibility for issuance and administration of Volume 1 thereof as found in this chapter. The department of industry, labor and human relations has similar responsibility for issuance and administration of Volume 2 which is found in ch. ILHR 16, Wis. Adm. Code.

(2) AVAILABILITY OF STATE ELECTRICAL CODE. The public service commission has adopted the 1984 edition of the National Electrical Safety Code (NESC-1981 1984) with certain deletions, changes and additions which are found in Volume 1, Wisconsin State Electrical Code. Copies of the NESC-1984 may be purchased from the Institute of Electrical and Electronics Engineers, Inc., 345 E. 47th Street, New York, NY 10017 IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854, telephone 212/644-7960 201/981-0060, or the American National Standards Institute, 1430 Broadway, New York, NY 10018, telephone 212/354-3300. 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.

Note: The department of industry, labor and human relations has similarly adopted the National Electrical Code (NEC) with certain deletions, changes and additions which are found in Volume 2, Wisconsin State Electrical Code. Copies of Volume 2, Wisconsin State Electrical Code, may be ordered from the Wisconsin Department of Administration, Document Sales, 202 S. Thornton Avenue, Madison, WI 53702. See chapter ILHR 16, Wis. Adm. Code, for current availability information for the National Electrical Code NEC.

PSC 114.02 PURPOSE AND SCOPE. (1) PURPOSE. The purpose of this chapter these rules is the practical safeguarding of persons during the installation, operation or maintenance of electric supply and communication lines and their associated equipment. The chapter They contains contain minimum provisions considered necessary for the safety of employees and the public and is. They are not intended as a design specification or an instruction manual.

(2) SCOPE. (a) This chapter covers supply and ~~communication~~ communications lines, equipment, and associated work practices employed by an electric supply, communication, railway, or similar utility in the exercise of its function as a utility. In addition, s. PSC 114-234A prohibits the location of a dwelling occupancy by any party under a transmission line and paragraph PSC 114-234C8 fixes minimum clearance requirements for the construction of a well by any party near open electric supply conductors. This chapter has also been adopted by the department of industry, labor and human relations as part of Volume 2, Wisconsin State Electrical Code, for application to installations over 600 volts of parties other than utilities.

(b) This chapter does not cover installations in mines, ships, railway rolling equipment, aircraft or automotive equipment, or utilization wiring except as covered in Parts 1 and 3, NESC-1981 1984.

PSC 114.03 AUTHORITY AND STATUTORY REFERENCES (1) STATUTORY AUTHORITY. Volume 1, Wisconsin State Electrical Code, constitutes a general order of the public service commission authorized by § 196.74 and 227.014, Stats.

(2) STATUTORY ENFORCEMENT. (a) Compliance with the requirements of Volume 1, Wisconsin State Electrical Code, is required before a utility may provide electric service even though some portions of the code may not be directly enforceable by state agencies. See s. 167.16, Stats. The authority for the enforcement of Volume 1, Wisconsin State Electrical Code, is vested in the public service 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.

Note: While the public service commission does not have jurisdiction for enforcement of Volume 1, Wisconsin State Electrical Code, over parties other than public utilities and railroads, electric utilities are prohibited under s. 167.16, Stats., from extending electric service to premises which are not in compliance with the Wisconsin State Electrical Code, which includes both Volumes 1 and 2.

(b) The requirements in the code are enforceable in the same manner as other orders of the public service commission. See § 102.57, 102.58, 195.07, 196.41, 196.64, 196.66, 196.74, and ch. 227, Stats.

(3) OTHER REQUIREMENTS. (a) Nothing in this code shall be construed to deprive a municipality of jurisdiction over utilities, places of employment or public buildings, except that no local requirements shall be less stringent than the requirements in this chapter. See s. 196.58, Stats.

(b) A utility may file with the public service commission ; as a condition of a rate application; requirements covering subject matter which is a part of this code, but such requirements must be acceptable and not less stringent than the requirements of this chapter. See s. 196.19, Stats.

Note: There are state statutes that refer directly to certain electrical construction. Some of these are § 66.047, 86.16, 134.40, 134.41, 167.16, 182.017, 182.0175, 182.018, 196.171, 196.58, 196.67 and 196.72, ~~196.81~~; and 893.28(2) Stats.

(4) COMPLAINTS. If a complaint is filed with the public service commission by any interested party to the effect that public safety requires changes in construction or methods of operation, the public service commission shall investigate and make recommendations. See s. 196.74, Stats., for procedure if changes in utility facilities are necessary.

PSC 114.04 GENERAL REQUIREMENTS. (1) CHARACTER OF CONSTRUCTION, MAINTENANCE AND OPERATION. All electrical power and communication equipment and lines shall be of such construction, and so installed, operated and maintained as to minimize the life and fire hazard.

(2) CONSTRUCTION, INSPECTION AND REPAIRS. (a) All construction and equipment shall be cleaned when necessary and inspected at such intervals as experience has shown to be necessary. Any equipment or construction known to be defective so as to endanger life or property shall be promptly repaired, permanently disconnected, or isolated until repairs can be made. Construction, repairs, additions and changes to electrical equipment and conductors shall be made by qualified persons only.

(b) Facilities installed or used in the generation, transmission, distribution and utilization of electricity shall be designed for such installation and use.

PSC 114.05 APPLICATION OF RULES. (1) NEW INSTALLATIONS AND EXTENSIONS. (a) This chapter shall apply in full to all new installations, reconstructions, alterations and extensions, except when any requirement rule is shown to be impracticable for special reasons or where the advantage of uniformity with existing construction is greater than the advantage of construction in compliance with this chapter the rules, providing the existing construction is reasonably safe;

(b) By bringing existing installations into conformity with this chapter these rules as far as may be directed by the public service commission and within the time determined by said agency; or

(c) Where the requirement is waived by the public service commission under sub. (3).

(2) EXISTING INSTALLATIONS. (a) Existing installations, including maintenance replacements, which comply with prior editions of the code, need not be modified to comply with this chapter these rules except as may be required for safety reasons by the administrative authority.

(b) Where conductors or equipment are added, altered, or replaced on an existing structure, the structure or the facilities on the structure need not be modified or replaced if the resulting installation will be in compliance with the rules which were in effect at the time of the original installation.

(3) WAIVING RULES. The rules are intended to apply to all installations, except as modified or waived by the public service commission. The requirements They are intended to be so modified or waived in particular cases whenever any rules are shown for any reason to be impracticable or if equivalent or safer construction safety is secured in other ways.

(4) TEMPORARY INSTALLATIONS. Modifying or waiving certain of the rules will sometimes be necessary in case of temporary installations or installations temporary construction which is are shortly to be dismantled or reconstructed. Such temporary construction may be used for a reasonable length of time without fully complying with this code, provided it is under competent supervision while it or adjoining equipment is alive energized, or if it is protected by suitable barriers or warning signs when accessible to any person; but all such construction shall be made reasonably safe.

(5) TESTING. Rooms which are used exclusively for routine or special electrical test work, and therefore are under the supervision of a qualified person, need comply with this code only insofar as is practicable for the character of the testing done.

(6) EMERGENCY. In case of emergency the person responsible for the installation may decide as to modification or waiver of any order, subject to review by the public service commission, even should an application be pending before the public service commission for a requested emergency related modification or waiver.

(7) INTENT. Rules in this code which are to be regarded as mandatory are characterized by the use of the word shall. Where a rule is of an advisory nature, to be followed insofar as practicable, it is indicated by the use of the word should. Other practices which are considered desirable are stated as RECOMMENDATIONS. NOTES contained herein, other than footnotes to tables, are for information purposes only and are not to be considered as mandatory or as part of the code requirements.

PSC 114.06 ADDOPTION OF STANDARD BY REFERENCE. (1) ADOPTION OF STANDARD. The National Electrical Safety Code -1981 1984 edition (also American National Standards Institute C2-1984 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-1984 will not be effective in this state until such time as this chapter is revised to reflect such changes.

(2) CONSENT TO INCORPORATE NESC-1981 1984 BY REFERENCE. Pursuant to s. 227.025, Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference of these standards contained in the NESC-1981 1984, except for the omissions as shown in s. PSC 114.07 and the changes and additions as shown later in subsequent sections of this chapter. Copies of the NESC-1981 1984 standard code are on file in the offices of the public service commission, the secretary of state, and the revisor of statutes.

PSC 114.07 OMISSIONS FROM NESC-1984. (1) OMISSIONS. The following portions of the NESC-1981 1984 are is not incorporated as part of the Wisconsin State Electrical Code, Volume 1:

(a) All Rules 010-016 of Section 1 - Introduction to the National Electrical Safety Code, pp. 47-48 45-46. ; and Rule 180B8; p- 125

(b- The following other portions, all of which relate to alternate clearance requirements based on known switching surge factors:

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232B1a-Exception	147
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233C2a-Exception	161
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PSC 114.08 CHANGES OR ADDITIONS TO NESC-1984. Following are the changes or additions to the NESC-~~1981~~ 1984 prescribed by the public service commission. Each change or addition has been prefixed by 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 114-96A3 [NESC 96A3, p. 80 78]. The word "Change" following the section number and heading means that the corresponding wording of the NESC-~~1981~~ 1984 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 inserted at the appropriate location.

## SECTION 2. DEFINITIONS OF SPECIAL TERMS

Administrative Authority [NESC, p. 51 49] (Change). The authority for the enforcement of this code is vested in the public service 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.

Commission [NESC, p. 51 50] (Addition). Public service commission of Wisconsin.

## SECTION 3. REFERENCES

PSC 114.03 [NESC, p. 61] (Change). Change reference [31] to read as follows:

ANSI/NFPA 70-1984, National Electrical Code.

## SECTION 9. GROUNDING METHODS FOR ELECTRIC SUPPLY AND COMMUNICATION FACILITIES

PSC 114.96A3 [NESC 96A3, p. 80 78] Multiple Grounded Systems

(Change). Change the first sentence A3 to read:

The neutral, which shall be of sufficient size and ampacity for the duty involved, shall be connected to made electrodes at each transformer location and at a sufficient number of additional points to total not less than nine grounds in each mile (1.6 km) of line, not including grounds at individual services.

Exception: In underground multiple-grounded systems where an insulating jacket is used over direct-buried concentric neutral supply cable for the purpose of corrosion mitigation, this requirement shall be permitted to be reduced to four grounds in each mile. This exception for use of supply cable with an insulating

jacket shall not be permitted for random lay construction. See Part 3, Rule 354, "Random Separation--Additional Requirements."

NOTE: Multiple grounding systems extending over a substantial distance are more dependent on the multiplicity of grounding electrodes than on the resistance to ground of any individual electrode. Therefore, no specific values are imposed for the resistance of individual electrodes.

PSC 114.97C [NESC 97C, p. 81 79] Separation of Grounding Conductors (Change). Change paragraph C. to read:

- C. Primary and secondary circuits utilizing a single conductor as a common neutral shall have at least nine ground connections on such conductor in each mile (1.6 km) of line exclusive of ground connections at customers' service equipment.

PART 1. RULES FOR THE INSTALLATION AND MAINTENANCE OF ELECTRICAL SUPPLY STATIONS AND EQUIPMENT

SECTION II. PROTECTIVE ARRANGEMENTS IN ELECTRICAL SUPPLY STATIONS

PSC 114-110A [NESC 110A, p. 85 83] Enclosure of Equipment (Change) Change second paragraph and note to read: (Addition). Add to third paragraph:

Metal fences; when used to enclose electrical supply-stations having energized electric conductors or equipment that can be reached by trespassers; shall be a minimum of seven feet-in height and shall be effectively grounded. In the case of chain-link, mesh or other open-type fences through which sticks or other objects can be inserted to make contact with live parts or parts that may become alive, horizontal clearance as specified in column 3 of Table 124-1, Minimum Clearance from Live Parts, shall be provided. Other types of construction such as non-metallic material shall present equivalent barriers to climbing or other unauthorized entry. These requirements shall also apply to fences around existing electric supply stations when fencing additions are made.

Note: It is recommended that, where permissible; a one-foot extension carrying three strands of barbed wire be used above the fence fabric; either as an outside or inside the fence overhang or as a vertical extension of the fence; to obtain the required overall height.

PSC 114-111E {NESC 111E; p. 89} Receptacles in Damp or Wet Locations (Change) Change subsection to read:

E. Receptacles in Damp or Wet Locations

All 120 V ac receptacles shall either be provided with ground fault interrupter (GFI) protection; or be on a grounded circuit which is periodically tested.

SECTION 12. INSTALLATION AND MAINTENANCE OF EQUIPMENT

PSC 114-127 [NESC 127, pp. 100 101-117] Hazardous Classified Locations (Change)

Change the first sentence of the introductory paragraph to read:

Electrical installations in hazardous areas shall meet the requirements of articles 500 through 503 and articles 511 through 517 of the National Electric Code-1981. Revise the following subsections of Rule 127, by changing the citations of Reference No. [31] from "ANSI/NFPA 70-1981" to "ANSI/NFPA 70-1984."

<u>127</u>	<u>line 2</u>	<u>page 101</u>
<u>127A.3.</u>	<u>line 5</u>	<u>page 101</u>
<u>127A.5</u>	<u>line 8</u>	<u>page 102</u>
<u>127A.6</u>	<u>line 9</u>	<u>page 102</u>
<u>127E.2.</u>	<u>line 2</u>	<u>page 108</u>
<u>127E.3.</u>	<u>line 4</u>	<u>page 111</u>
<u>127F.1.</u>	<u>line 5</u>	<u>page 112</u>
<u>127F.2.</u>	<u>line 5</u>	<u>page 112</u>
<u>127H.1.</u>	<u>line 4</u>	<u>page 113</u>
<u>127H.2.</u>	<u>line 5</u>	<u>page 113</u>
<u>127K.3.</u>	<u>line 3</u>	<u>page 113</u>
<u>127L.3.</u>	<u>line 3</u>	<u>page 117</u>

SECTION 18. SWITCHGEAR AND METAL ENCLOSED BUS

PSC 114-180B7 {NESC 180B7; p. 124} Metal Enclosed Power Switchgear (Change) Change paragraph to read:

7. Low-voltage cables or conductors; except those to be connected to equipment within the compartment; which are routed through medium or high voltage divisions of switchgear; shall be isolated by grounded metal barriers.

PART 2. SAFETY RULES FOR THE INSTALLATION AND MAINTENANCE  
OF OVERHEAD ELECTRIC SUPPLY AND COMMUNICATION LINES

SECTION 20. PURPOSE, SCOPE AND APPLICATION OF RULES

PSC 114-202 [NEC 202, p. 131] Application of Rules (Change).  
Change the first sentence to read:

The general requirements for application of these rules are  
contained in Rule PSC 114.05.

SECTION 21. GENERAL REQUIREMENTS

PSC 114-210 [NEC 210, p. 131] Referenced Sections (Change).  
Change rule 210 to read:

210. Referenced Sections

The Introduction (Section 1) as amended by § PSC 114.01  
- PSC 114.07, Definitions (Section 2) as amended by Section 2  
of Chapter PSC 114, List of Referenced Documents (Section 3)  
as amended by Section 3 of Chapter PSC 114 and Grounding  
Methods (Section 9) as amended by Section 9 of Chapter PSC  
114 shall apply to the requirements of Part 2.

PSC 114-217 [follows NEC 216, p. 134] Marking of Poles and  
Structures Carrying High Voltage Supply Lines  
(Addition). Add the following section:

PSC 114-217 MARKING OF POLES AND STRUCTURES CARRYING HIGH  
VOLTAGE SUPPLY LINES. A: Section 196-67, Stats.; provides the  
following in part:

196-67 Warning signs: (1) Every corporation, company or  
person constructing, operating or maintaining an electric trans-  
mission line with a voltage of six thousand 2,000 or more between  
conductors or between conductors and the ground shall by January  
1, 1988 place warning signs not less than four feet nor more than  
six from 4 to 6 feet (1.22 to 1.83 m) from above the ground upon  
all poles or other structures supporting such the line: when

- (a) within 100 feet (30.48 m) of school grounds; and
- (b) within 100 feet (30.48 m) of any place where such the  
line crosses a public highway; and
- (c) within any city or village.

(2) Every such sign shall be in red, black, orange or  
reflective letters not less than 2 inches high on a contrasting  
background and shall read "Danger--High-Voltage." The commission  
may establish standards for electric transmission line pole signs  
having at least equivalent warning qualities to signs specified in  
this subsection; and warning signs meeting standards established

or approved by the commission shall be deemed to be in compliance with this section.

B: (2) The following shall constitute standards established by the commission for warning signs on overhead electrical supply line poles and structures:

1: (a) "Danger--High Voltage" warning signs which meet the requirements as to format of subsections 1926.200(a) and (b) of Part 1926-Safety and Health Regulations for Construction-1979 (OSHA) as found in the Code of Federal Regulations, subject to the following ~~condition~~ conditions:

a: 1. The overall dimensions of these signs shall not be less than 10 inches by 7 inches (25.4 cm by 17.78 cm) except that in those situations where use of a sign this size is not practicable, two or more signs not smaller than 7 inches by 5 inches (17.78 cm by 12.7 cm) may be substituted; and

b: Letters of the words "High Voltage" shall be in red, black, orange, or reflective letters on the contrasting white background and at least 2 inches (5.08 cm) in height. Exception: For those specific signs having dimensions of 10 inches (25.4 cm) horizontal by 7 inches (17.78 cm) vertical the height of letters shall not be less than 1½ inches (3.175 cm).

E: (3) Warning signs installed as replacements or installed as new facilities shall comply with the standards as prescribed in PSC 114-217B(2).

Note: This rule amends and expands the application of the warning sign requirements of s. 196.67, Stats. See § 196.67(1m).

### SECTION 23. CLEARANCES

PSC 114-230C1 [NESC 230, p. 138] Supply Cables (Change).  
Change C.1. to read:

1. Cables of any voltage having an effectively grounded continuous metal sheath or shield, or cables designed to operate on a multigrounded system at 22 kV or less, having a semiconducting insulation shield in combination with suitable metallic drainage, all supported on and cabled together with an effectively grounded bare messenger-neutral.

PSC 114-231C [NESC 231C, p. 140] Clearances from Railroad Tracks  
(Change) Change Exception 1 to read: (Deletion)  
Delete Exception 1.

Exception 1. At industrial sidings, a clearance of not less than 7 feet shall be permitted where a supporting structure is not the controlling obstruction; provided sufficient space for a driveway is left where cars are loaded or unloaded.

Renumber Exceptions 2, 3 and 4 to 1, 2 and 3.

Table PSC 114-232-1 [NESC, Table 232-1, pp. 142-146: feet;  
pp. 148-152: metric] Minimum Vertical  
Clearance of Wires, Conductors and Cables  
Above Ground, Rails, or Water (Changes, and  
Deletions, Additions)

Table PSC 114-232-1 which follows includes the following changes,  
deletions and additions in NESC Table 232.1:

Footnotes (8a) and 17 have has been changed.

Footnote 10 has also been applied to item 9; column 3.

Footnote 18 has been deleted.

A new Footnote 23 has been added deleted.

Footnote 24 has been added changed.

Footnote 25 has been changed.

Footnote 26 has been added.

Footnote 27 has been added and its reference in  
column 1 of item 4.

The second column heading has been changed.

A collective title has been added (including reference  
to Footnote 26) over headings of third, fourth, and  
fifth columns as shown.

References to Footnote 23 have been deleted in lines 2  
and 9 of the second column.

Item 7 contains different requirements for clearances  
over water areas: has been changed as follows:

a. Reference to Footnote 18 has been deleted.

b. For 7(a), (b) and (c) substitute the corresponding  
provisions of the 1981 Wisconsin supplement.

Table PSC 114-232-1

**Minimum Vertical Clearance of Wires, Conductors, and Cables Above Ground, Rails, or Water FT**  
 (Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definition section for voltages of other systems.)

Nature of surface underneath wires, conductors, or cables	Communication conductors and cables, guys, messengers, surge protection wires, neutral conductors meeting Rule 230E1, supply line, street lighting, and service drop cables meeting Rule 230C1 and supply cables of 0 to 750 V meeting Rules 230C2 or 230C3 (ft)	Supply line, street lighting, and service drop conductors <sup>26</sup>		Trolley and electrified railroad contact conductors and associated span or messenger wires <sup>1</sup>		
		Open supply line conductors of 0 to 750 V and supply cables over 750 V meeting Rule 230C2 or 230C3 (ft)	Open supply line conductors		0 to 750 V to ground (ft)	750 V to 50 kV to ground (ft)
<b>Where wires, conductors, or cables cross over or overhang</b>						
1. Track rails of railroads (except electrified railroads using over-head trolley conductors) <sup>2 3 6 20</sup>	<sup>3 15</sup> 27	<sup>3</sup> 27	<sup>3</sup> 28	29	<sup>4</sup> 22	<sup>4</sup> 22
2. Roads, streets, alleys; nonresidential driveways, parking lots, and other areas subject to truck traffic <sup>21 22</sup>	<sup>6 13</sup> 18	18	20	21	<sup>5</sup> 18	<sup>5</sup> 20
3. Residential driveways; commercial areas not subject to truck traffic <sup>21 22</sup>	<sup>24</sup> 12	<sup>8a</sup> 15	20	21	<sup>5</sup> 18	<sup>5</sup> 20
4. Other land traversed by vehicles such as cultivated, grazing, forest, orchard, etc <sup>27</sup>	18	18	20	21	-	-
5. Spaces or ways accessible to pedestrians only <sup>9</sup>	<sup>8 7</sup> 15	<sup>8a 14</sup> 15	15	16	16	18
6. Water areas not suitable for sailboating or where sailboating is prohibited <sup>15</sup>	15	15	17	17	-	-
7. Water areas suitable for sailboating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with an unobstructed surface area of: <sup>17 19</sup>						
(a) Less than 1/2 acres	18	18	20	<del>21</del> 22	-	-
(b) 1/2 to 80 acres	<del>26</del> 30	<del>26</del> 30	<del>28</del> 31	<del>29</del> 33	-	-
(c) Over 80 acres	<del>28</del> 40	<del>28</del> 40	<del>31</del> 40	<del>35</del> 42	-	-
8. Public or private land and water areas posted for rigging or launching sailboats	Clearance above ground shall be 5 ft greater than in 7 above, for the type of water areas served by the launching site					
Where wires, conductors, or cables run along and within the limits of highways or other road rights-of-way but do not overhang the roadway						
9. Roads, streets, or alleys <sup>13 25</sup>	18	18	20	21	<sup>5</sup> 18	<sup>5</sup> 20
10. Roads in rural districts where it is unlikely that vehicles will be crossing under the line <sup>10 12</sup>	14	<sup>10</sup> 15	18	19	<sup>5</sup> 18	<sup>5</sup> 20

① Where subways, tunnels, or bridges require it, less clearances above ground or rails than required by Table 232-1 may be used locally. The trolley and electrified railroad contact conductor should be graded very gradually from the regular construction down to the reduced elevation.

② For wire, conductors, or cables crossing over mine, logging, and similar railways which handle only cars lower than standard freight cars, the clearance may be reduced by an amount equal to the difference in height between the highest loaded car handled and 20 ft, but the clearances shall not be reduced below that required for street crossings.

③ These clearances may be reduced to 25 ft where paralleled by trolley-contact conductor on the same street or highway.

④ In communities where 21 ft has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans. (See Rule 289D2 for conditions which must be met where uniform height above rail is impractical.)

⑤ In communities where 16 ft has been established for trolley and electrified railroad contact conductors 0 to 750 V to ground, or 18 ft for trolley and electrified railroad contact conductors exceeding 750 V, or

where local conditions make it impractical to obtain the clearance given in the table, these reduced clearances may be used if carefully maintained.

⑥ If a communication service drop or a guy which is effectively grounded or is insulated against the highest voltage to which it is exposed, up to 87 kV, crosses residential streets and roads, the clearance may be reduced to 16 ft at the side of the traveled way provided the clearance at the center of the traveled way is at least 18 ft. This reduction in clearance does not apply to arterial streets and highways which are primarily for through traffic, usually on a continuous route.

⑦ This clearance may be reduced to the following values:

	<i>feet</i>
(a) For insulated communication conductors and communication cables	8
(b) For conductors of other communication circuits	10
(c) For guys	5
(d) For supply cables meeting Rule 230C1	10

⑧ This clearance may be reduced to the following values:

- (a) 12 ft for supply conductors limited to 300 V to ground
- (b) 10 ft for drip loops of service drop conductors limited to 150 V to ground and meeting Rules 230C2 or 230C3 and the portion of the associated service drop span located within 15 ft of the service entrance to buildings.

⑨ Spaces and ways accessible to pedestrians only are areas where vehicular traffic is not normally encountered or not reasonably anticipated.

⑩ Where a supply or communication line along a road is located relative to fences, ditches, embankments, etc., so that the ground under the line would not be expected to be traveled except by pedestrians, this clearance may be reduced to the following values:

	<i>feet</i>
(a) Insulated communication conductor and communication cables	8
(b) Conductors of other communication circuits	10
(c) Supply cables of any voltage meeting Rule 230C1 and supply cables limited to 150 V to ground meeting Rules 230C2 or 230C3	10

(d) Supply conductors limited to 300 V to ground	12
(e) Guys	5

⑪ No clearance from ground is required for anchor guys not crossing track rails, streets, driveways, roads, or pathways.

⑫ This clearance may be reduced to 13 ft for communication conductors.

⑬ Where this construction crosses over or runs along alleys, driveways, or parking lots, this clearance may be reduced to 15 ft for spans limited to 150 ft.

⑭ Where supply circuits of 600 V or less, with transmitted power of 5000 W or less, are run along fenced (or otherwise guarded) private rights-of-way in accordance with the provisions specified in Rule 220B2, this clearance may be reduced to 10 ft.

⑮ The value may be reduced to 25 ft for guys, for cables carried on messengers, and for supply cables meeting Rule 230C1. This value may be reduced to 25 ft for conductors effectively grounded throughout their length and associated with supply circuits of 0 to 22 kV, only if such conductors are stranded, are of corrosion-resistant material, and conform to the strength and tension requirements for messengers given in Rule 2611.

16 Adjacent to tunnels and overhead bridges which restrict the height of loaded rail cars to less than 20 ft, these clearances may be reduced by the difference between the highest loaded rail car handled and 20 ft, if mutually agreed to by the parties at interest.

17 For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high water level. For other waters, the surface area and clearances shall be based on the normal high water level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any 1 mi long segment which includes the crossing. The clearance over a canal, river, or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water.

~~18 Where an overwater obstruction restricts vessel height to less than the following:~~

<del>For a surface area in acres of</del>	<del>A reference vessel height in feet of</del>
<del>less than 20</del>	<del>16</del>
<del>20 to 200</del>	<del>24</del>
<del>200 to 2000</del>	<del>30</del>
<del>over 2000</del>	<del>36</del>

~~the required clearance may be reduced by the difference between the reference vessel height given above~~

~~and the overwater obstruction height, except that the reduced clearance shall not be less than that required for the surface area on the line crossing side of the obstruction.~~

19 Where the US Army Corps of Engineers, or the State, or a surrogate thereof has issued a crossing permit, clearances of that permit shall govern.

20 See Rule 234H for the required horizontal and diagonal clearances to rail cars.

21 These clearances do not allow for the future road resurfacing.

22 For the purpose of this rule, trucks are defined as any vehicle exceeding 8 ft in height. Areas not subject to truck traffic are areas where truck traffic is not normally encountered or not reasonably anticipated.

~~23 For communications cables supported on a messenger, and with span lengths not exceeding 150 ft, the clearance may be reduced to 17 ft above or along local streets or roads. This reduction does not apply for arterial streets or highways which are primarily for through traffic, usually on a continuous route.~~

24 This clearance may be reduced to 10 ft for communication conductors and cables, guys, and messengers.

25 Communication cables supported on a steel messenger may have a 60° F clearance of 15 ft where span lengths do not exceed 150 ft, 16 ft where span lengths do not exceed 200 ft, and 17 ft where span lengths do not exceed 250 ft, and poles are back of curbs or other deterrents to vehicular traffic.

26 A diagonal clearance the same as the vertical clearance shall be maintained to uneven or sloping terrain within a horizontal distance of 1/4 of the vertical clearance, all distances to be measured from the conductors in their wind-displaced position as defined in Rule 234A1.

27 The clearance for communication conductors and cables not supported by a messenger shall be permitted to be installed at a minimum of 15 feet.

Table PSC 114-232-1

**Minimum Vertical Clearance of Wires, Conductors, and Cables Above Ground, Rails, or Water** M  
 (Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definition section for voltages of other systems.)

Nature of surface underneath wires or cables	Communication conductors and cables, guys, messengers, surge protection wires, neutral conductors meeting Rule 230C1, supply line, street lighting, and service drop cables meeting Rule 230C1 and supply cables of 0 to 750 V meeting Rules 230C2 or 230C3 (a)	Supply line, street lighting, and service drop conductors (2)		Trolley and electrified railroad contact conductors and associated span or messenger wires (1)	
		Open supply line conductors of 0 to 750 V and supply cables over 750 V meeting Rules 230C2 or 230C3 (m)	Open supply line conductors 750 V to 22 kV (m) 22 to 50 kV (m)	0 to 750 V to ground (m)	750 V to 50 kV to ground (m)

Where wires, conductors, or cables cross over or overhang

1. Track rails of railroads (except electrified railroads using over-head trolley conductors) (2) (16) (20)	(3) (15) 8.2	(3) 8.2	(3) 8.5	8.8	(4) 6.7	(4) 6.7
2. Roads, streets, alleys; nonresidential driveways, parking lots, and other areas subject to truck traffic (21) (22)	(6) (13) 5.5	5.5	6.1	6.4	(5) 5.5	(5) 6.1
3. Residential driveways; commercial areas not subject to truck traffic (21) (22)	(24) 3.7	(8a) 4.6	6.1	6.4	(5) 5.5	(5) 6.1

4. Other land traversed by vehicles such as cultivated, grazing, forest, orchard, etc	(27) 5.5	5.5	6.1	6.4	—	—
5. Spaces or ways accessible to pedestrians only (9)	(5) (1) 4.6	(8a) (14) 4.6	4.6	4.9	4.9	5.5
6. Water areas not suitable for sailboating or where sailboating is prohibited (19)	4.6	4.6	5.2	5.2	—	—
7. Water areas suitable for sailboating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with an unobstructed surface area of: (17) (19)						
(a) Less than 4 ha	5.5	5.5	6.1	6.4	—	—
(b) 4 to 32 ha	<del>7.9</del> 9.1	<del>7.9</del> 9.1	<del>8.5</del> 11.1	<del>8.5</del> 10.0	—	—
(c) Over 32 ha	<del>9.8</del> 12.2	<del>9.8</del> 12.2	<del>10.4</del> 12.2	<del>10.7</del> 12.8	—	—
5. Public or private land and water areas posted for rigging or launching sailboats		Clearance above ground shall be 1.5 m greater than in 7 above, for the type of water areas served by the launching site				

Where wires, conductors, or cables run along and within the limits of highways or other road rights-of-way but do not overhang the roadway

9. Roads, streets, or alleys (13)	(25) 5.5	5.5	6.1	6.4	(5) 5.5	(5) 6.1
10. Roads in rural districts where it is unlikely that vehicles will be crossing under the line	(10) (12) 4.3	(10) 4.6	5.5	5.8	(5) 5.5	(5) 6.1

① Where subways, tunnels, or bridges require it, less clearances above ground or rails than required by Table 232-1 may be used locally. The trolley and electrified railroad contact conductor should be graded very gradually from the regular construction down to the reduced elevation.

② For wire, conductors, or cables crossing over mine, logging, and similar railways which handle only cars lower than standard freight cars, the clearance may be reduced by an amount equal to the difference in height between the highest loaded car handled and 6.1 m but the clearances shall not be reduced below that required for street crossings.

③ These clearances may be reduced to 7.6 m where paralleled by trolley-contact conductor on the same street or highway.

④ In communities where 6.4 m has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans. (See Rule 289D2 for conditions which must be met where uniform height above rail is impractical.)

⑤ In communities where 4.9 m has been established for trolley and electrified railroad contact conductors 0 to 750 V to ground, or 5.5 m for trolley and electrified railroad contact conductors exceeding 750 V, or where local conditions make it impractical to obtain the clearance given in the table, these reduced clearances may be used if carefully maintained.

⑥ If a communication service drop or a guy which is effectively grounded or is insulated against the highest voltage to which it is exposed, up to 8.7 kV, crosses residential streets and roads, the clearance may be reduced to 4.9 m at the side of the traveled way provided the clearance at the center of the traveled way is at least 5.5 m. This reduction in clearance does not apply to arterial streets and highways which are primarily for through traffic, usually on a continuous route.

⑦ This clearance may be reduced to the following values:

(a) For insulated communication conductors and communication cables	(m) 2.45
(b) For conductors of other communication circuits	3.0
(c) For guys	2.45
(d) For supply cables meeting Rule 230C1	3.0

⑧ This clearance may be reduced to the following values:

- (a) 3.6 m for supply conductors limited to 300 V to ground
- (b) 3.0 m for drip loops of service drop conductors limited to 150 V to ground and meeting Rules 230C2 or 230C3 and the portion of the associated service drop spar located within 4.6 m of the service entrance to buildings.

⑨ Spaces and ways accessible to pedestrians only are areas where vehicular traffic is not normally encountered or not reasonably anticipated.

⑩ Where a supply or communication line along a road is located relative to fences, ditches, embankments, etc., so that the ground under the line would not be expected to be traveled except by pedestrians, this clearance may be reduced to the following values:

(a) Insulated communication conductor and communication cables	(m) 2.45
(b) Conductors of other communication circuits	3.0
(c) Supply cables of any voltage meeting Rule 230C1 and supply cables limited to 150 V to ground meeting Rules 230C2 and 230C3	3.0
(d) Supply conductors limited to 300 V to ground	3.6
(e) Guys	2.45

⑪ No clearance from ground is required for anchor guys not crossing track rails, streets, driveways, roads, or pathways.

⑫ This clearance may be reduced to 4.0 m for communication conductors.

⑬ Where this construction crosses over or runs along alleys, driveways, or parking lots, this clearance may be reduced to 4.6 m for spans limited to 45 m.

⑭ Where supply circuits of 600 V or less, with transmitted power of 5000 W or less, are run along fenced (or otherwise guarded) private rights-of-way in accordance with the provisions specified in Rule 220B2, this clearance may be reduced to 3.0 m.

⑮ The value may be reduced to 7.6 m for guys, for cables carried on messengers, and for supply cables meeting Rule 230C1. This value may be reduced to 7.6 m for conductors effectively grounded throughout their length and associated with supply circuits of 0 to 22 kV, only if such conductors are stranded, are of corrosion-resistant material, and conform to the strength and tension requirements for messengers given in Rule 2611.

⑯ Adjacent to tunnels and overhead bridges which restrict the height of loaded rail cars to less than 6.1 m, these clearances may be reduced by the difference between the highest loaded rail car handled and 6.1 m, if mutually agreed to by the parties at interest.

⑰ For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high water level. For other waters, the surface area and clearances shall be based on the normal high water level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any 1600 m long segment which includes the crossing. The clearance over a canal, river, or stream normally used to provide access for sailboats to a large body of water shall be the same as that required for the larger body of water.

Footnotes for Table PSC 114-232-1 (continued)

M

~~18~~ Where an overwater obstruction restricts vessel height to less than the following:

<del>For a surface area in ha of</del>	<del>A reference vessel height in m of</del>
<del>less than 8</del>	<del>4.9</del>
<del>8 to 80</del>	<del>7.3</del>
<del>80 to 800</del>	<del>9.0</del>
<del>over 800</del>	<del>11.0</del>

~~the required clearance may be reduced by the difference between the reference vessel height given above and the overwater obstruction height, except that the reduced clearance shall not be less than that required for the surface area on the line crossing side of the obstruction.~~

~~19~~ Where the US Army Corps of Engineers, or the State, or a surrogate thereof has issued a crossing permit, clearances of that permit shall govern.

20 See Rule 234H for the required horizontal and diagonal clearances to rail cars.

21 These clearances do not allow for the future road resurfacing.

22 For the purpose of this rule, trucks are defined as any vehicle exceeding 2.45 m in height. Areas not subject to truck traffic are areas where truck traffic is not normally encountered or not reasonably anticipated.

~~23~~ For communications cables supported on a messenger, and with span lengths not exceeding 45 m, the clearance may be reduced to 5.2 m above or along local streets or roads. This reduction does not apply for arterial streets or highways which are primarily for through traffic, usually on a continuous route.

24 This clearance may be reduced to 3.0 m for communication conductors and cables, guys, and messengers.

25 Communication cables supported on a steel messenger may have a 15° C clearance of 4.6 m where span lengths do not exceed 45 m, 4.9 m where span lengths do not exceed 61 m, and 5.2 m where span lengths do not exceed 76 m, and poles are back of curbs or other deterrents to vehicular traffic.

26 A diagonal clearance the same as the vertical clearance shall be maintained to uneven or sloping terrain within a horizontal distance of 1/4 of the vertical clearance, all distances to be measured from the conductors in their wind-displaced position as defined in Rule 234A1.

27 The clearance for communication conductors and cables not supported by a messenger shall be permitted to be installed at a minimum of 4.6 m.

Table PSC 114-232-2 {NESC; Table 232-2; pp. 150-151} Minimum Vertical Clearance of Rigid Live Parts Above Ground (Addition)

Table PSC 114-232-2 which follows includes the following addition to NESC Table 232-2:

Footnote 7 has been added:

**Table PSC 114-232-2  
MINIMUM VERTICAL CLEARANCE OF RIGID LIVE PARTS ABOVE GROUND**

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definition section for voltages of other systems.)

Nature of surface below live parts	0 to 750 V (ft)	750 V to 15 kV (ft)	15 to 50 kV (ft)
1. Where live parts overhang:			
a. Roads, streets, alleys; nonresidential driveways; parking lots and other areas subject to truck traffic ④⑤	15	18	⑦20
b. Residential driveways; commercial areas not subject to truck traffic ④⑤	①13	18	⑦20
c. Other land traversed by vehicles such as cultivated land, grazing land, forest, orchard, etc.	16	18	⑦20
d. Spaces and ways accessible to pedestrians only.⑥	①③④13	13	15
2. Where live parts are along and within the limits of highways or other road rights-of-way but do not overhang the roadway:			
a. Roads, streets, and alleys	②16	18	⑦20
b. Roads in rural districts where it is unlikely that vehicles will be crossing under the line	②13	18	18

① This clearance may be reduced to the following values:

- |   |      |
|---|------|
| (a) Live parts limited to 300 V to ground   | feet |
| (b) Live parts limited to 150 V to ground and short lengths of supply cables meeting Rule 230C2 or 230C3 and located at the electric service entrance to building | 12   |
|   | 10   |

② Where a supply line along a road is limited to 300 V to ground and is located relative to fences, ditches, embankments, etc., so that the ground under the line would not be expected to be traveled except by pedestrians, this clearance may be reduced to 12 ft.

③ Where supply circuits of 600 V or less with transmitted power of 5000 W or less, are run along fenced (or otherwise guarded) private rights-of-way in accordance with the provisions specified in Rule 220B2, this clearance may be reduced to 10 ft.

④ For the purpose of this rule, trucks are defined as any vehicle exceeding 8 ft. in height.

⑤ These clearances do not allow for future road resurfacing.

⑥ Spaces and ways accessible to pedestrians only are areas where vehicular traffic is not normally encountered or not reasonably anticipated.

⑦ Except for rigid live parts overhanging alleys this clearance shall be permitted to be reduced to 15 feet.

Table PSC 114-232-3 [NESC, Table 232-3, p. 160] Reference Heights  
(Changes).

Change f. to read as follows:

<u>f.</u>	<u>Water areas suitable for sail- boating including lakes, ponds, reservoirs, tidal waters, rivers, streams and canals with an unobstructed surface area of:</u>	<u>Ft.</u>	<u>m.</u>
(1)	<u>Less than 10 acres</u>	<u>18</u>	<u>5.5</u>
(2)	<u>10 to 80 acres</u>	<u>30</u>	<u>9.0</u>
(3)	<u>Over 80 acres</u>	<u>40</u>	<u>12.0</u>

Change Footnote 3 to read:

- <sup>3</sup> For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high water level. For other waters, the surface area and clearances shall be based on the normal high water level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any one-mile-long (1600 m) segment which includes the crossing. The clearance over a canal, river or stream normally providing access for sailboats to a larger body of water shall be the same as that required for the larger body of water.

Delete Footnote 4.

PSC 114-234A4 [follows NESC 234A3, p. 168 180] Transmission Lines Over Dwelling Occupancies (Addition). Add the following paragraph:

4. Transmission Lines Over Dwelling Occupancies

Supply lines designed to operate at voltages in excess of 35 kV shall not be constructed over ~~dwelling occupancies~~ dwelling or mobile homes intended for residential occupancy and ~~dwelling occupancies~~ dwelling or mobile homes intended for residential occupancy shall not be located under such lines. This provision is also ~~applies intended to cover the~~ applies intended to cover the line conductors in their wind-displaced position as defined in Rule 234A1.

Note 1: The term "dwelling" as used herein is the same as defined in Volume 2, Wisconsin State Electrical Code (NEC/NFPA 70-1984), i.e., "Dwelling Unit: One or more rooms for the use of one or more persons as a housekeeping unit with space for eating, living, and sleeping, and permanent provisions for cooking and sanitation."

Note 2: Electric utilities are prohibited by s. 167.16, Stats., from extending electric service to premises which are not in compliance with the Wisconsin State Electrical Code.

PSC 114-234-1 [NESC Table 234-1, pp. 170-171 182-183: feet; pp. 184-185: metric] Clearance of Supply Wires, Conductors, and Cables Passing By But Not Attached to Buildings and Other Installations Except Bridges (Changes and Additions)

Table PSC 114-234-1 which follows contains the following changes and additions:

Clearance value for the fourth entry of column 1 has been changed.

Footnote 6 has been changed.

Footnotes Footnote 5; 8 and 9 have has been added.

The-fourth-entry-from-the-top-in-column-2-has-been-changed.

Table PSC 114-234-1

Clearance of Wires, Conductors, and Cables Passing by but Not Attached to Building and Other Installations Except Bridges FT

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definitions section for voltages of other systems.)

Clearance of	Communication conductors and cables, guys, messengers, surge protection wires, neutral conductors meeting Rule 230E1, supply cables of all voltages meeting Rule 230C1, and supply cables and service drops of 0 to 750 V meeting Rule 230C2 or 230C3 (ft)	Supply line conductors, street lighting conductors, and service drops			
		Open supply line conductors 0 to 750 V, and supply cables over 750 V meeting Rule 230C2 or 230C3 (ft)	Open supply line conductors		
			750 V to 6.7 kV (ft)	8.7 to 22 kV (ft)	22 to 50 kV (ft)
<b>Buildings</b>					
<b>Horizontal</b>					
To walls and projections	② 3	② ① 5	① ② 5	6	7
To unguarded windows	3	② ① 5	5	6	7
To balconies and areas accessible to pedestrians ③	3	5	5	6	7
<b>Vertical</b>					
Above or below roofs or projections not accessible to pedestrians ① ②	3/8	10	10	10	11

Above or below balconies and roofs accessible to pedestrians ③	8	⑤ 15	15	15	16
Above roofs accessible to truck traffic ⑥	18	18	20	20	21
Above roofs accessible to vehicles but not subject to truck traffic ⑥	10	⑤ 15	20	20	21
Signs, chimneys, radio and television antennas, tanks, and other installations not classified as buildings or bridges ④					
Horizontal	3	① ② 5	① ② 5	③ 6	7
Vertical above or below	3	① 5	8	8	9

① Where building, sign, chimney, antenna, tank, or other installation does not require maintenance such as painting, washing, changing of sign letters, or other operation which would require persons to work or pass between supply conductors and structure, the clearance may be reduced to 3 ft.

② Where available space will not permit this value, the clearance may be reduced to the maximum practical clearance but the minimum clearance may not be less than 3 ft provided the conductors, including splices and taps, have covering which provides sufficient dielectric to prevent a short circuit in case of a momentary contact between the conductors and a grounded surface.

③ A roof, balcony, or area is considered accessible to pedestrians if the means of access is through a doorway, ramp, stairway, or permanently mounted ladder.

④ The required clearances shall be to the closest approach of motorized signs or moving portions of installations covered by Rule 234C.

⑤ This clearance may be reduced to 12 ft to supply conductors limited to 300 V to ground.

⑥ For the purpose of this rule, trucks are defined as any vehicles exceeding 8 feet in height.

⑦ This clearance may be reduced to 3 in for the grounded portions of guys.

⑧ This clearance may be reduced to 3 ft. for supply conductors limited to 300 V to ground and communication conductors and cables if the roof has a slope of not less than 1 to 3.

Table PSC 114-234-1

Clearance of Wires, Conductors, and Cables Passing by but Not Attached to Building and Other Installations Except Bridges

M

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definitions section for voltages of other systems.)

Clearance of	Communication conductors and cables, guys, messengers, surge protection wires, neutral conductors meeting Rule 230E1, supply cables of all voltages meeting Rule 230C1, and supply cables and service drops of 0 to 750 V meeting Rule 230C2 or 230C3 (m)	Supply line conductors, street lighting conductors, and service drops			
		Open supply line conductors of 0 to 750 V, and supply cables over 750 V meeting Rule 230C2 or 230C3 (m)	Open supply line conductors		
			750 V to 8.7 kV (m)	8.7 to 22 kV (m)	22 to 50 kV (m)
<b>Buildings</b>					
<b>Horizontal</b>					
To walls and projections	① 0.90	②① 1.50	①② 1.50	1.50	2.13
To unguarded windows	0.90	②① 1.50	1.50	1.80	2.13
To balconies and areas accessible to pedestrians ③	0.90	1.50	1.50	1.80	2.13
<b>Vertical</b>					
Above or below roofs or projections not accessible to pedestrians ④⑤	2.45 <del>0.90</del>	3.0	3.0	3.0	3.4
<hr/>					
Above or below balconies and roofs accessible to pedestrians ③	2.45	⑤ 4.6	4.6	4.6	4.9
Above roofs accessible to truck traffic ⑥	5.5	5.5	6.1	6.1	6.4
Above roofs accessible to vehicles but not subject to truck traffic ⑥	3.0	⑤ 4.6	6.1	6.1	6.4
<b>Signs, chimneys, radio and television antennas, tanks, and other installations not classified as buildings or bridges ④</b>					
Horizontal	0.90	①② 1.50	①② 1.50	1.80	2.13
Vertical above or below	0.90	① 1.50	2.45	2.45	2.75

③ Where building, sign, chimney, antenna, tank, or other installation does not require maintenance such as painting, washing, changing of sign letters, or other operation which would require persons to work or pass between supply conductors and structure, the clearance may be reduced to 0.90 m.

④ Where available space will not permit this value, the clearance may be reduced to the maximum practical clearance but the minimum clearance may not be less than 0.90 m provided the conductors, including splices and taps, have covering which provides sufficient dielectric to prevent a short circuit in case of a momentary contact between the conductors and a grounded surface.

⑤ A roof, balcony, or area is considered accessible to pedestrians if the means of access is through a doorway, ramp, stairway, or permanently mounted ladder.

⑥ The required clearances shall be to the closest approach of motorized signs or moving portions of installations covered by Rule 234C.

⑦ This clearance may be reduced to 3.6 m for supply conductors limited to 300 V to ground.

⑧ For the purpose of this rule, trucks are defined as any vehicles exceeding 2.45 m in height.

⑨ This clearance may be reduced to 75 mm for the grounded portions of guys.

⑩ This clearance may be reduced to 0.90 m for supply conductors limited to 300 V to ground and communication conductors and cables if the roof has a slope of not less than 1 to 3.

PSC 114-234C4c [NESC 234C4c, p.173 187] Supply Conductors Attached to Buildings (Change). Change Exception 1 to read as follows:

Exception 1: Where the voltage between conductors does not exceed 300 volts and the roof has a slope of not less than 4 inches in 12 inches, the clearance may be reduced to 3 feet (0.90 m).

PSC 114-234C4d {follows NESC 234C4e; p. 173} Supply Conductors Attached to Buildings (Addition) Add the following subdivision:

d. Service conductors not in excess of 600 volts between conductors shall have a clearance of not less than 3 feet from windows; doors; porches; fire escapes or similar locations.

Exception: This requirement does not apply to conductors that run above the top level of a window.

PSC 114-234C6 [follows NESC 234C5, p. 173 187] Near Stored Materials (Addition). Add the following paragraph:

#### 6. Near Stored Materials

Lines should not be run over areas where material is regularly stored and handled by cranes, dump trucks, elevators or other types of high machinery unless the clearance of such lines is adequate to permit full use of the equipment.

Note: Material which requires the use of such high machinery should not be stored near or under existing lines.

PSC 114-234C7 [follows NESC 234C5, p. 173 187] Near Fuel Storage Tanks (Addition). Add the following paragraph:

7. Near Fuel Storage Tanks

A horizontal clearance of not less than 8 feet shall be maintained between above-ground flammable liquids and liquefied petroleum gas storage tanks and supply cables of all voltages meeting Rule 230C3. A horizontal clearance of not less than 15 feet shall be maintained between such fuel storage tanks for all other supply conductors.

Exception Note: These requirements do not apply to liquefied petroleum gas tanks with capacity of 1,000 gallons or less.

PSC 114.234C8 [follows NESC 234C5, p. 173 187] Near Wells. (Addition). Add the following paragraph:

8. Near Wells

A horizontal distance of at least 3/4 of the required vertical clearance of the conductors to ground (Rule 232) shall be maintained between open conductors and wells. Persons installing such wells shall also comply with this requirement.

Note: Electric utilities are prohibited by s. 167.16, Stats., from extending electric service to premises which are not in compliance with the Wisconsin State Electrical Code.

PSC 114-234C9 [follows NESC 234C5, p. 187] Antennas (Addition).  
Add the following paragraph:

9. Antennas

Note: Additional requirements with respect to the proximity of antennas to power and communications lines is found in § Ind 62.39 and Ind 62.40, Wis. Adm. Code.

PSC 114-234E1 [NESC 234E1, p. 176 190] Minimum Clearance of Wires, Conductors, or Cables Installed Over or Near Swimming Areas (Change). Change paragraph E to read:

1. Swimming Pools

Where wires, conductors, or cables cross over a swimming pool or the surrounding area within 10 ft. of the inside wall of the pool, the clearances in any direction shall be as shown in Figure PSC 114-234-2. The values of A, B, C and D are specified in Table PSC 114-234-3.

Exception- This rule does not apply to a pool fully enclosed by a solid or screened permanent structure.

E. Minimum Clearance of Wires, Conductors, or Cables Installed Over or Near Swimming Areas.

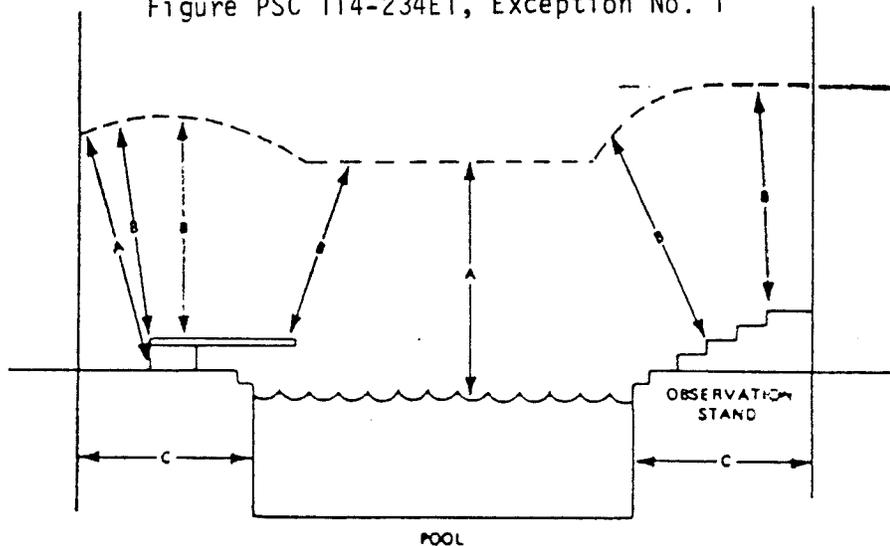
1. Swimming Pools

The following parts of pools shall not be placed under existing service-drop conductors or any other open overhead wiring; nor shall such wiring be installed above the following: (1) pools and the area extending 10 feet (3.05 m) horizontally from the inside of the walls of the pool; (2) diving structure; or (3) observation stands, towers, or platforms.

EXCEPTION 1: Structures listed in (1), (2), and (3) above shall be permitted under utility-owned, -operated and -maintained supply lines or service drops where such installations provide the following clearances:

	Insulated supply or service drop cables, 0-750 volts to ground, supported on and cabled together with an effectively grounded bare messenger	All other supply or service drop conductors	
		Voltage to Ground	
		0-15 kV	15-50 kV
A. Clearance in any direction to the water level, edge of water surface, base of diving platform or permanently-anchored raft	18 feet (5.49m)	25 feet (7.62m)	27 feet (8.23m)
B. Clearance in any direction to the diving platform or tower	14 feet (4.27m)	16 feet (4.88m)	18 feet (5.49m)
C. Horizontal limit of clearance measured from inside wall of the pool.	This limit shall extend to the outer edge of the structures listed in (1) and (2) above but not less than 10 feet (3.05m).		

Figure PSC 114-234E1, Exception No. 1



EXCEPTION 2: Utility-owned, -operated, and -maintained communication conductors, community antenna system coaxial cables complying with Article 820, and the supporting messengers shall be permitted at a height of not less than 10 feet (3.05 m) above swimming and wading pools, diving structures and observation stands, towers, or platforms.

EXCEPTION 3: This rule does not apply to a pool fully enclosed by a solid or screened permanent structure.

Figure PSC 114-234-2 {NFSC Figure 234-2; p: 176} Swimming Pool Clearances (Change)

Table PSC 114-234-3 {NESC; Table 234-3, p: 177} Clearance of Supply Wires, Conductors, and Cables Passing Over or Near Swimming Areas (Change and Addition)

Table PSC 114-234-3 which follows includes the following changes in NESC Table 234-3:

Line C has been changed:

Line D has been added:

PSC 114-236J [follows NESC 236I, p. 206 223] Climbing Space in Rack Construction (Addition). Add the following subsection:

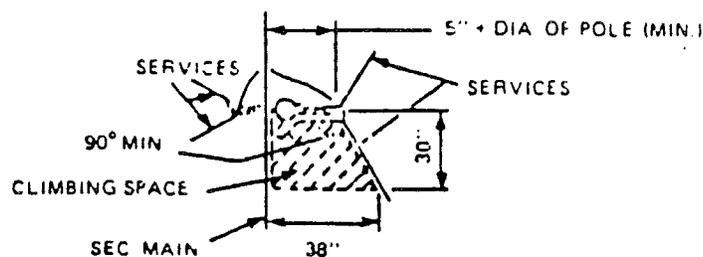
#### J. Climbing Space in Rack Construction

Where the voltage between conductors is less than 600 volts, climbing space shall be maintained through the levels of conductors supported in rack construction and for a vertical distance of not less than 40 inches above the top conductor and not less than 40 inches below the bottom conductor so supported. The width of the climbing space measured horizontally through the center of the pole shall be not less than 5 inches plus the diameter of the pole. The depth of the climbing space shall be not less than 30 inches measured perpendicularly to this climbing space boundary through the center line of pole. The width of the climbing space, perpendicular to and at the extremity of this 30-inch depth dimension, shall be not less than 38 inches and neither of the other 2 side boundaries shall make an angle of less than 90 degrees with the boundary through the center line of pole. The climbing spaces through the levels of conductors of two or more rack groups which are separated less than 6 feet shall be maintained in the same quadrant or on the same side of the pole. Vertical conductors are not permitted in the climbing spaces through conductors in rack construction.

Figure PSC 114-236J depicts the general climbing space past rack construction.

Figure PSC 114-236J

#### CLIMBING SPACE PAST RACK CONSTRUCTION



PSC 114-238D {NESC 238D, p. 208} Clearance from Drip Loops of Luminaire Brackets (Change) Change subsection to read:

D. Clearance from Drip Loops of Luminaire Brackets:

If a drip loop of conductors entering a luminaire bracket from the surface of the structure is above a communication cable, the lowest point of the loop shall be at least 12 inches above the communication cable or through bolt unless guarded. The conductor shall not be closer than 2 inches to the open bottom of the guard.

PSC 114-239C [NESC 239C, p. 211 230] Mechanical Protection Near Ground (Addition) (Change). Add the following as the second sentence in the subsection Change paragraph C to read:

C. Mechanical Protection Near Ground.

Where within 8 feet (2.45 m) of the ground, all vertical conductors, cables, and grounding wires shall be protected by a covering which gives suitable mechanical protection. Raceways installed on poles for supply conductors shall be of rigid metal conduit, intermediate metal conduit, PVC Schedule 80 or equivalent conduit or galvanized steel U-guard extending from at least 1 foot (0.30 m) below ground level up to a point 8 feet (2.45 m) above finished grade. For grounding wires from surge arresters, the protective covering shall be of wood molding or of other nonmetallic material giving equivalent mechanical protection.

(No change to "Exceptions")

PSC 114-239F7 {follows NESC 239F6, p. 215} Requirements for Vertical Supply Conductors Passing Through Communication Space on Jointly Used Line Structures (Addition) Add the following subsection:

7. Multiple-Conductor Cables Attached Directly to Surface of the Line Structure

Multiple-conductor cables operating at voltages not exceeding 600 volts between conductors may be attached directly to the surface of the line structure if protected by a suitable nonmetallic covering in addition to the normal conductor insulation. The nonmetallic covering may consist of a U-guard or other suitable nonmetallic covering. Each conductor shall be insulated for a potential of at least 600 volts. Where used as aerial services, the point where such cables leave the structure shall be at least 40 inches above the highest or 40 inches below the lowest communication attachment. All splices and connections in the cable shall be insulated.

PSC 114-239F8 [follows NESC 239F7, p. 236] Requirements for Vertical Supply Conductors Passing Through Communication Space on Jointly Used Line Structures (Addition). Add the following paragraph:

8. Concentric Neutral or Similar Cable

Concentric neutral or similar cables may be fastened directly to the surface of the line structure. Such cables shall be protected with suitable non-metallic covering up to a distance of 40 inches (1 m) above the highest communication attachment. All splices and connections in the cable shall be insulated.

SECTION 24. GRADES OF CONSTRUCTION

Table FSC 114-242-1 [NESC, Table 242-1, pp. 220-222 240-242] Grades of Construction for Supply Conductors Alone, at Crossing, or on the Same Structures With Other Conductors (Addition)

Table FSC 114-242-1, which follows, contains the following addition:

Footnote 11 has been added.

Table PSC 114-242-1

GRADES of CONSTRUCTION for SUPPLY CONDUCTORS ALONE, at CROSSING, or on the SAME STRUCTURES WITH OTHER CONDUCTORS

(The voltages listed in this table are line to ground values for: effective grounded ac circuits, two wire grounded circuits, or center grounded dc circuits, otherwise line to line values shall be used. The grade of construction for supply conductors, as indicated across the top of the table, must also meet the requirements for any lines at lower levels except when otherwise noted.)

Supply conductors at higher levels ①  Conductors, tracks and rights of way at lower levels	Constant-potential supply conductors										Constant current supply conductors	Communication conductors used exclusively in the operation of and run as supply lines	
	0-0.75 kV		0.75-8.7 kV				Exceeding 8.7 kV ②						
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural			
	Open or Cable	Open or Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable			
Exclusive private rights-of-way	N	N	②N	N	N	N	②N	②N	N	N	B, C, or N; see Rule 242A	C or N; see Rule 242C	
Common or public rights-of-way	N	N	C	N	N	N	③C	C	N	N	B, C or N; see Rule 242A	B, C, or N; see Rule 242C	
Railroad tracks and limited access highways	B	B	B	B	B	B	B	B	B	B			B
Constant potential supply conductors 0 to 750 V Open or cable	N	N	C	N	N	N	③C	C	④C	N			
750 V to 8.7 kV Open	⑤C	N	C	C	N	N	③C	C	N	N			
Cable	N	N	C	N	N	N	③C	C	N	N			
Exceeding 8.7 kV Open	⑥B	⑥C	B	B	N	N	③C	C	N	N			
Cable	⑥C	N	C	N	N	N	③C	C	N	N			
Constant current supply conductors: Open or cable	B, C, or N; see Rule 242A										B, C, or N; see Rule 242A	B, C, or N; see Rules 242A and 242C	
Communication conductors: Open or cable, used exclusively in the operation of supply lines ⑦	B, C, or N; see Rule 242C										B, C, or N; see Rules 242A and 242C	B, C, or N; see Rule 242C	
Communication conductor: Urban or rural, open or cable ⑧	N	N	⑦⑧B	C	⑦⑧B	C	⑧B	C	⑧B	C	⑧B C or N; see Rule 242A	B, C, or N; see Rule 242C	

Footnotes for Table PSC 114-242-1:

- ① The words "open" and "cable" appearing in the headings have the following meanings as applied to supply conductors: Cable means the Type 1 cables described in Rule 241A; open means open wire and Type 2 cables.
- ② Lines that fall outside the exclusive private rights-of-way shall comply with the grades specified for lines not on exclusive private rights-of-way.
- ③ Supply conductors shall meet the requirements of grade B construction if the supply circuits will not be promptly de-energized, both initially and following subsequent breaker operations, in the event of a contact with lower supply conductors or other grounded objects.
- ④ Grade N construction may be used if crossing over supply services only.
- ⑤ If the wires are service drops, they may have grade N sizes and tensions as set forth in Table 263-2.
- ⑥ Grade N construction may be used where the communication conductors consist only of not more than one insulated twisted-pair or parallel-lay conductor, or where service drops only are involved.
- ⑦ Grade C construction may be used if the voltage does not exceed 2.9 kV.

- ⑧ The supply conductors need only meet the requirements of grade C construction if both of the following conditions are fulfilled:
  - (1) The supply voltage will be promptly removed from the communication plant by de-energization or other means, both initially and following subsequent circuit breaker operations in the event of a contact with the communication plant.
  - (2) The voltage and current impressed on the communication plant in the event of a contact with the supply conductors are not in excess of the safe operating limit of the communication protective devices.
- ⑨ Grade C construction may be used if the current cannot exceed 75 A or the open-circuit voltage of the transformer supplying the circuit does not exceed 2.5 kV.
- ⑩ Communication circuits located below supply conductors shall not affect the grade of construction of the supply circuits.
- ⑪ Grade B construction shall always be used if the voltage exceeds 175 kV (to ground).

SECTION 25. LOADING FOR GRADES B, C, AND D

PSC 114.250D [follows NESC 250C, p. 228 250] Longitudinal Capability (Addition). Add the following subsection:

D. Longitudinal Capability

Each supply line designed to operate at 300 kV phase-to-phase or above shall be constructed to limit the effects of a cascading-type failure to a line segment not exceeding 6 miles to 10 miles in length. Such construction requirement may be met by providing at appropriate intervals, structures and associated facilities having full dead-end capability under the loading provisions of 250 A, B and C. Consideration shall be given to factors such as structure type and material, length of line, distance between dead-end or heavy angle structures, and other basic design criteria in determining the length of such individual line segments. For lines supported by "flexible" structures designed with plastic, energy-absorbing capability in failure this requirement may be met if such design and construction will provide equivalent limitation to longitudinal cascading.

Table PSC 114-261-3 [NESC, Table 261-3, p. 259] Overload Capacity Factor for Wood Structures (Addition)

Table PSC 114-261-3, which follows, contains the following addition:

Footnote 1 has been added.

Table PSC 114-261-3

Overload Capacity Factors for Wood Structures				
	Grade B		Grade C	
	When installed	At replacement: <sup>①</sup>	When installed	At replacement: <sup>①</sup>
Transverse (wind) and Vertical strength				
At Crossings	4.0	2.67	2.67	1.33
Elsewhere	4.0	2.67	2.00	1.33
Transverse (wire tension load) strength				
At Crossings	2.0	1.33	1.33	1.00
Elsewhere	2.0	1.33	1.33	1.00
Longitudinal Strength				
In general	1.33	1.00	no requirement	no requirement
At dead-ends	2.00	1.33	1.33	1.00

<sup>①</sup> "When installed" values apply to the initial installation of the wood structure. Where conductors or equipment are altered or replaced on existing structures the structures need not be replaced provided the resultant overload capacity factor exceeds the "At Replacement" value.

NOTES: (1) Where structures are built for temporary service the overload capacity factors at replacement may be used provided that the designated fiber stress is not exceeded during the life of the structure.

(2) The factors in this table apply for the loading conditions of Rule 250B. For extreme wind loading conditions, see Rule 260C.

(3) Metal portions of a structure, except guys, may use the overload capacity factors for metal shown in Table 261-2.

PART 3. UNDERGROUND LINES

SECTION 31. GENERAL REQUIREMENTS APPLYING TO  
UNDERGROUND LINES

PSC 114-310 [NESC 310, p. 296] (Change).  
Change Rule 310 to read as follows:

310. The Introduction (Section 1) as amended by § PSC 114.01-  
PSC 114.07, Definitions (Section 2) as amended by  
Section 2 of Chapter PSC 114, List of Referenced  
Documents (Section 3) as amended by Section 3 of Chapter  
PSC 114 and Grounding Methods (Section 9) as amended by  
Section 9 of Chapter PSC 114 shall apply to the  
requirements of Part 3.

PSC 114-311C [follows NESC 311B, p. 277 296] Installation and  
Maintenance - Markers (Addition). Add the following  
subsection:

C. Markers

When underground electric supply lines over 750  
volts are located outside the corporate limits of  
cities, villages, or developed areas, their location  
shall be marked in a manner recognizable to the public  
at each road crossing, railroad crossing, or drainage  
ditch crossing to identify the location of the facility.

PSC 114-316 [NESC 316; pp. 279-280] Induced Voltage (Addition) Add  
the following sentence to the section:

Steady-state induced voltages of 50 volts AC rms or more are  
considered hazardous for the purposes of this rule:

PSC 114-317 [follows NESC 316, p. 280 299] Outdoor Location of  
Oil-Insulated Padmounted Transformers Near Buildings  
(Addition). Add the following section:

PSC 114-317 OUTDOOR LOCATION OF OIL-INSULATED PADMOUNTED  
TRANSFORMERS NEAR BUILDINGS

A. Noncombustible and Combustible Walls

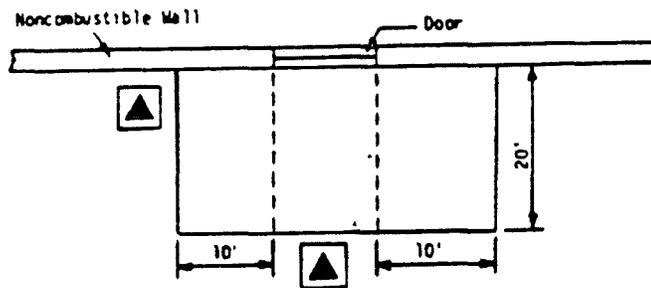
For the purposes of this section, combustible walls  
are walls of Type No. 8 buildings as determined by s.  
ILHR 51.03, Wis. Adm. Code. All other walls are considered  
to be non-combustible.

A. 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.

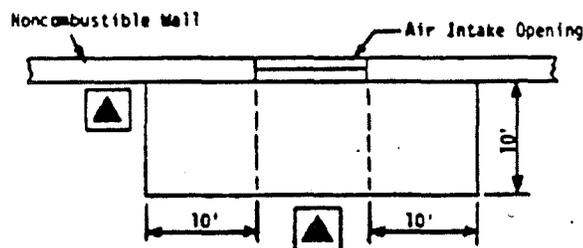
1. Padmounted oil-insulated transformers shall not be located within a zone extending 20' outward and 10' to either side of a building door. See Figure PSC 114-317AB1.

FIGURE PSC 114-317AB1.



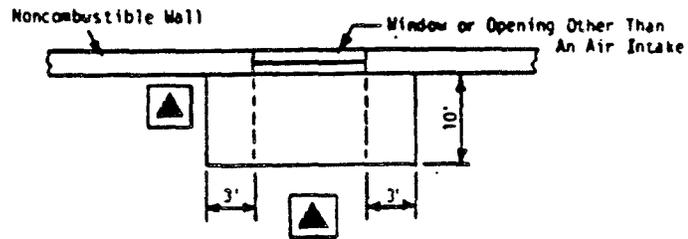
2. Padmounted oil-insulated transformers shall not be located within a zone extending 10' outward and 10' to either side of an air intake opening. Such transformers may be located within said zone beneath an air intake opening provided there is not less than 25 feet diagonal separation between the transformer and said opening. See Figure PSC 114-317AB2.

FIGURE PSC 114-317AB2.



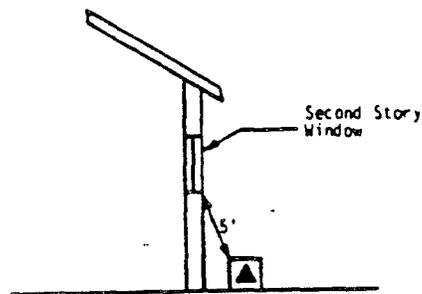
3.a. Padmounted oil-insulated transformers shall not be located within a zone extending 10' outward and 3' to either side of a building window or opening other than an air intake. See Figure PSC 114-317AB3a.

FIGURE PSC 114-317AB3a.



b. For second story windows, the transformer shall not be located less than 5' from any part of the window. See Figure PSC 317AB3b.

FIGURE PSC 114-317AB3b.



B- 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 A B for noncombustible walls.

2. Padmounted oil-insulated transformers in sizes above 100 kVA shall be located a minimum of 10' 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.

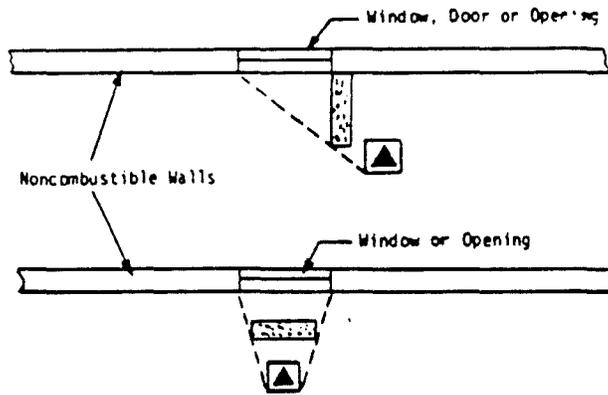
C- D. Barriers

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

1. Noncombustible Walls

The barrier shall extend to a projection line from the corner of the padmount to the furthest corner of the window, door or opening in question. The height of the barrier shall be 1' above the top of the padmount transformer. See Figure PSC 114-317ED1.

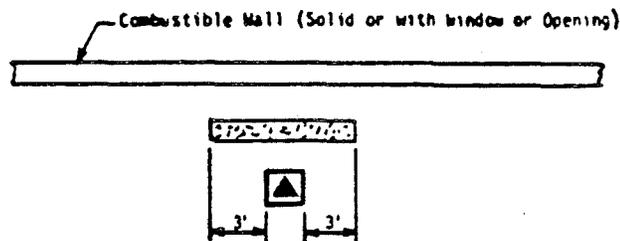
FIGURE PSC 114-317ED1.



## 2. Combustible Walls

The barrier shall extend 3' beyond each side of the padmount transformer. The height of the barrier shall be 1' above the top of the transformer. See Figure PSC 114-317ED2.

FIGURE PSC 114-317ED2.



## D- E. Fire Escapes

Padmounted oil-insulated transformers shall be located such that a minimum clearance of 20' is maintained from fire escapes at all times.

## SECTION 32. UNDERGROUND CONDUIT SYSTEMS

PSC 114-320B7 [follows NESC 320B6, p. 282 301] Clearances from Other Underground Installations - Gas Lines (Addition). Add the following paragraph:

### 7. Gas Lines

a. The separation in any direction of gas transmission lines from electric supply and communications conduit systems shall be a minimum of 12 inches.

b. The separation in any direction of gas distribution or service lines from electric supply and communication conduit systems shall be a minimum of 6 inches.

Exception: If these clearances cannot be attained, the gas line must be protected from damage that might result from the proximity of the electric supply or communication conduit system.

Note: The definition of gas "transmission line," "distribution line," and "service line" as used herein is the same as that found in s. PSC 135.09-192.3, Wis. Adm. Code.

### SECTION 35. DIRECT BURIED CABLE

PSC 114-352E [follows NESC 352D, p. 296 315] Clearances from Other Underground Installations - Gas Lines (Addition). Add the following subsection:

#### E. Gas Lines

The separation in any direction of gas pipelines from direct buried electric supply and communication facilities shall be a minimum of 12 inches.

Exception: If this clearance cannot be attained, the gas line must be protected from damage that might result from the proximity of the electric supply or communication direct buried system.

PSC 114-353D2a [NESC 353D2a, p. 297-298 316] Depth of Burial (Change and Addition)

Change Exception to Exception 1.

Add Exception 2 as follows:

Exception 2: Temporary installations of secondary underground cables operating at less than 600 volts between conductors shall be permitted to be laid on the ground during winter months provided they are suitably protected.

PSC 114-354E4 [NESC 354E4, p. 300 319] Random Separation - Protection (Change). Change the paragraph to read:

#### 4. Adequate Bonding

a. Bonding shall be provided between the effectively grounded supply conductor or conductors and the communication cable shield or sheath (preferably at intervals not to exceed 1,000 feet).

b. At each above or below grade transformer or above or below grade pedestal all existing grounds shall be interconnected. These include primary neutral, secondary neutral, power cable shield, metal duct, or sheath and communication cable sheath.

c. 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.

### SECTION 36. RISERS

PSC 114-360A [NESC 360A, p. 300 319] General (Change). Change subsection to read:

- A. Mechanical protection for supply conductors or cables shall be provided as required by Part 2 of this code. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, PVC Schedule 80 or equivalent conduit or galvanized steel U-guard extending from at least 1 foot (0.30 m) below ground level up to a point 8 feet above finished grade.

### SECTION 38. EQUIPMENT

PSC 11--381H [follows NESC 381G, p. 321 323] Warning Signs (Addition). Add subsection to read:

#### H. Warning Signs

1. Where a padmounted transformer, switchgear, pedestal, or similar above-grade enclosure is not within a fenced or other protected area and contains live parts in excess of 600 volts, a permanent and conspicuous warning sign shall be provided reading substantially as follows: "Caution--High Voltage Inside--Keep Out."
2. Electric supply equipment installed prior to the effective date of these rules shall be signed to comply with these rules by October 1, 1984.

PART 4. RULES FOR THE OPERATION OF ELECTRIC-SUPPLY  
AND COMMUNICATIONS LINES AND EQUIPMENT

SECTION 40. PURPOSE AND SCOPE

PSC 114-402 [NESC 401, p. 326] Referenced Sections  
(Change). Change first sentence of Rule 402 to read  
as follows:

The Introduction (Section 1) as amended by § PSC 114.01 - PSC  
114.07, Definitions (Section 2) as amended by Section 2 of Chapter  
PSC 114, List of Referenced Documents (Section 3) as amended by  
Section 3 of Chapter PSC 114 and Grounding Methods (Section 9) as  
amended by Section 9 of Chapter PSC 114 shall apply to the  
requirements of Part 4.

SECTION 42. SUPPLY SYSTEMS -- RULES FOR EMPLOYEES

PSC 114-423A3 [NESC 423A3, p. 344] De-energizing Equipment or  
Lines to Protect Employees, Application of Rules  
(Addition). Add the following Exception and Note to  
423A3:

Exception: This does not apply to interactive  
installations of 20 kW or less.

Note: See s. PSC 113.70(5), Wis. Adm. Code.

PSC 114-423C [NESC 423C, p. 324] Opening Disconnectors and Tagging  
(Change) Change the end of the last sentence of NESC 243C from:

"...and the name of the system operator;"

to

"...and the name or title of the system operator;"

PSC 114-423D [NESC 423D, p. 324] Employee's Protective Grounds  
(Change) Change the second sentence of NESC 423D to read:

Grounds shall be placed between the work location and all  
sources of energy and as close as practicable to the work location;  
or grounds shall be placed at the work location.

PSC 114-423H [NESC 423H, p. 325] Removal of Tags (Change- Change  
the second sentence of NESC 423H from:

"Upon removal of any tag, there shall be added to the record  
containing the name of the system operator and the..."

to

"Upon removal of any tag, there shall be added to the record  
containing the name or title of the system operator and the..."

PSC 114-4231 {NESC 4231; p: 325} Restoring Service (Change) Change subsection to read:

I. Restoring Service

Only after all protective grounds have been removed from the line or equipment and after all protective tags have been removed by the above procedure at a specific location; may the system operator direct the closing of disconnectors and switches at that location.



State of Wisconsin \ PUBLIC SERVICE COMMISSION

March 26, 1985

NESS FLORES, CHAIRMAN  
BRANKO TERZIC, COMMISSIONER  
MARY LOU MUNTS, COMMISSIONER  
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MADISON, WISCONSIN 53707

Mr. Gary Poulson  
Assistant Revisor of Statutes  
411 West, State Capitol  
Madison, Wisconsin 53702

File No. 2-U-5058.17  
84-213

Re: In the Matter of Proposed Amendment of Chapter  
PSC 114, Wis. Adm. Code, as Wisconsin State  
Electrical Code, Volume 1

Dear Mr. Poulson:

Enclosed please find two copies (one certified) of an order  
of the Public Service Commission adopting rules in the above-  
entitled matter.

The rules have been seen by legislative committees (sent  
December 20, 1984).

Sincerely,

A handwritten signature in cursive script, appearing to read "Steve Levine".

Steven Levine  
Assistant Chief Counsel

SL:nea

Enc.

P.S. Please note that s. 167.16 should be changed to s. 101.865  
on pages 2, 3, 12 and 14. Remember to let us see galley  
print before printing in code format. Thank you.