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NESC SUBCOMMITTEE 3  
ELECTRIC SUPPLY STATIONS  
20 Oct, 2005-20 Oct, 2005  
IEEE, Piscataway, NJ

Name	Organization	10/20
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<a href="#">Christopher A Carson</a> (Alternate)	SEEX	X
<a href="#">D. J Christofersen</a> (Principal)	IEEE/PES/SUB	X
<a href="#">Alton L Comans</a> (Principal)	AEIC	X
<a href="#">W. Bruce Dietzman</a> (Principal)	IEEE	X
<a href="#">Gary R Engmann</a> (Principal)	IEEE	X
<a href="#">Keith C Harrison</a> (Principal)	NRECA	A
<a href="#">Steven J Kollmann</a> (Principal)	EEI	X
<a href="#">Mark A Konz</a> (Principal)	SEEX	A
<a href="#">Thomas McNamara</a> (Principal)	NEMA	A
<a href="#">Robert D Saint</a> (Alternate)	NRECA	X
<a href="#">Robert E Sipler, Jr</a> (Principal)	NARUC	A
<a href="#">James R Tomaseski</a> (Principal)	IBEW	X
<a href="#">Brian Winoski</a> (Alternate)	EEI	A
<a href="#">Phillip Young</a> (Principal)	EEI	A
<a href="#">George Zaczek</a> (Principal)	APPA	X

### Guest

<a href="#">Sue Vogel</a>	IEEE	X
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**Chair:** D.J. Christofersen

**X - Present**

**Secretary:** Gary Engmann

**A - Absent**

**Meeting Note:** Gary Engmann has replaced Jim Tomaseski as the Secretary for Subcommittee 3.

\*\*\*\*\*

Proposed TIA from SC3 for Rule 111A for 2002 and 2007 Edition has been created. It will be sent out for processing.

\*\*\*\*\*

In Table 111-1, bold face the word Substations, 3rd line up from the bottom. This is considered an editorial change.

Motion was approved unanimously.

SC3 formed a Working Group 3.1 to address Table 111-1.

Robert Saint and Gary Engmann

\*\*\*\*\*

Work Group 3.2 Inside fence clearances

Alton Comans will head a working group to develop a TIA to address this issue.

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**New Text**

Part: 1 Section: 10 Rule: 102 **CP2741**

**Subcommittee Recommendation:** Accept.

**Subcommittee Comment:**

**Vote on Subcommittee Recommendation:**

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

**Explanation of Vote:**

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**New Text**

Part: 1 Section: 10 Rule: 103 **CP2742**

**Subcommittee Recommendation:** Accept

**Subcommittee Comment:**

**Vote on Subcommittee Recommendation:**

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

**Explanation of Vote:**

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**Deleted Text**Part: 1 Section: 11 Rule: 110 A1 **CP2608****Subcommittee Recommendation:** Accept**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

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**New Text**Part: 1 Section: 11 Rule: 110 A1 **CP2609****Subcommittee Recommendation:** Accept**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

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**New Text**Part: 1 Section: 11 Rule: 110 B2,Exemption 3(4) **CP2610****Subcommittee Recommendation:** Accept**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

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**Deleted Text**Part: 1 Section: 12 Rule: 121 **CP2712***Also Section:4 SC1*

*Part:2 Section:21 214 SC4*

*Part:3 Section:31 313 SC7*

**CM4352 J Frederick Doering self**

*Section:4*

**CM4420 James T Collins** Southeastern Electric Exchange

*Section:4*

**CM4705 Michael Hyland** American Public Power Association

*Part:1 Section:12 121*

**CM5022 Allen Clapp self**

*Entire CP*

**Subcommittee Recommendation:** Reject

**Subcommittee Comment:**

See comments from the Preprint.

**Vote on Subcommittee Recommendation:**

**Affirmative:** (10) Carson, Christofersen, Comans, Dietzman, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (1) Engmann

**Explanation of Vote:**

Sipler - While I see significant merits in this proposal, there are portions that go beyond the safety role of this code. The various notes are also problematical and may lead to confusion.

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**Revised Text**

Part: 1 Section: 12 Rule: 123 C **CP2840**

*Also Part:1 Section:17 173 C SC3*

**CM4399 J Frederick Doering Self**

*Part:1 Section:12 123 C*

**Subcommittee Recommendation:** Accept

**Subcommittee Comment:**

Reference Rule 442D

**Vote on Subcommittee Recommendation:**

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

**Explanation of Vote:**

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**Revised Text**

Part: 1 Section: 12 Rule: 124 124A1, Table 124-1 **CP2674**

**CM4223 Robert Kluge** Wisconsin Utilities Association

Part:1 Section:12 124 124A1, Table 124-1

**CM4398 J Frederick Doering** Self

Part:1 Section:12 124 124A1, Table 124-1

**CM4573 Steve West** Portland General Electric

Part:1 Section:12 124 124A1, Table 124-1

**CM5025 Allen Clapp** self

Part:1 Section:12 124 124A1, Table 124-1

**Subcommittee Recommendation:** Accept as modified in 2005**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (10) Carson, Christofersen, Comans, Dietzman, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek**Negative:** (0)**Abstention:** (1) Engmann**Explanation of Vote:**

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**Revised Text**Part: 1 Section: 12 Rule: 124 C3 **CP2743****CM4033 David Marne** NSPE/HDR/Self

Part:1 Section:12 124 C3

**CM5032 Allen Clapp** self

Part:1 Section:12 124 C3

**Subcommittee Recommendation:** Accept as modified in 2005**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

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**Revised Text**Part: 1 Section: 12 Rule: 124 Fig 124-2 **CP2744****Subcommittee Recommendation:** Accept**Subcommittee Comment:****Vote on Subcommittee Recommendation:**

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

### Explanation of Vote:

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#### Revised Text

Part: 1 Section: 12 Rule: 124 Table 124-1 **CP2641**

*Also Table of Contents* **SC8**

*Part:2 Section:22 223 A3* **SC4**

*Part:3 Section:31 315 A3* **SC7**

*Part:4 Section:44 441 A4* **SC8**

*Part:4 Section:44 441 A4a* **SC8**

*Part:4 Section:44 441 A4b* **SC8**

*Part:4 Section:44 441 A4b2* **SC8**

*Part:4 Section:44 441 A5b* **SC8**

*Part:4 Section:44 441 B3a* **SC8**

*Part:4 Section:44 441 Table 441-2* **SC8**

*Part:4 Section:44 441 Table 441-3* **SC8**

*Part:4 Section:44 441 Table441-4* **SC8**

**CM4222 J Frederick Doering** Self

Table of Contents

**CM4303 Jeffrey Boksiner**

Part:2 Section:22 223 A3

**CM4305 Jeffrey Boksiner**

Part:3 Section:31 315 A3

**CM4416 James T Collins** Southeastern Electric Exchange

Entire CP

**CM4766 Michael Hyland** American Public Power Association

Entire CP

**CM4767 Michael Hyland** American Public Power Association

Entire CP

**Subcommittee Recommendation:** Accept as modified in 2005

### Subcommittee Comment:

#### Vote on Subcommittee Recommendation:

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

### Explanation of Vote:

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#### Revised Text

Part: 1 Section: 12 Rule: 124 Table 124-1 **CP2777**

**CM5037 Allen Clapp** self

Part:1 Section:12 124 Table 124-1

**Subcommittee Recommendation:** Reject

**Subcommittee Comment:**

Reference to column numbers are in the text of Rule 124C2.

**Vote on Subcommittee Recommendation:**

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

**Explanation of Vote:**

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**Revised Text**

Part: 1 Section: 12 Rule: 125 B **CP2745**

**CM5048 Allen Clapp self**

Part:1 Section:12 125 B

**Subcommittee Recommendation:** Accept as Modified in Preprint/2003

**Subcommittee Comment:**

**Vote on Subcommittee Recommendation:**

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

**Explanation of Vote:**

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**Revised Text**

Part: 1 Section: 16 Rule: 162 A **CP2746**

**Subcommittee Recommendation:** Accept

**Subcommittee Comment:**

**Vote on Subcommittee Recommendation:**

**Affirmative:** (11) Carson, Christofersen, Comans, Dietzman, Engmann, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek

**Negative:** (0)

**Abstention:** (0)

**Explanation of Vote:**

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**Revised Text**Part: 1 Section: 18 Rule: 180 B1 **CP2747****CM5033 Allen Clapp self**

Part:1 Section:18 180 B1

**Subcommittee Recommendation:** Accept as modified in 2005**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (10) Carson, Christofersen, Comans, Dietzman, Harrison, Kollmann, Saint, Sipler, Jr, Tomaseski, Zaczek**Negative:** (0)**Abstention:** (1) Engmann**Explanation of Vote:**

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**Meeting Conclusion:**

Typo in Table 124-1, page 45.

The “condition” column is empty. See attached below Part 1 Typos

\*\*\*\*\*

See Table 124-1, add “column and number” to each of the cells. See Table124-1 rework below.

\*\*\*\*\*

**Part 1 Typos**

**Table 125-1  
Working Space**

<b>Voltage to ground</b>	<b>Clear Distance</b>					
	<b>Condition 1</b>		<b>Condition 2</b>		<b>Condition 3</b>	
	<b>(mm)</b>	<b>(ft)</b>	<b>(mm)</b>	<b>(ft)</b>	<b>(mm)</b>	<b>(ft)</b>
0—150	900	3	900	3	900	3
151--600	900	3	1070	3-1/2	1200	4

**B. Working Space Over 600 V**

Working space shall be in accordance with Table 124-1 [Clearance From Live Parts](#)

Table 124 Reworked

Table 124-1 Clearances From Live Parts

Part A—Low, Medium, and High Voltages (based on BIL factors)

<u>Column 1</u>	<u>Column C</u>	<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
Maximum Design Voltage between Phases <del>(1)</del> kV	Basic Impulse Insulation Level 5 (BIL) kV	Vertical clearance of unguarded parts <sup>1</sup> <del>(2)</del> <sup>+</sup> m	Horizontal clearance of unguarded parts <sup>1</sup> <del>(3)</del> <sup>+</sup> m	Clearance guard to live parts <sup>1</sup> <del>(4)</del> <sup>+</sup> mm
0.151–0.6	—	2.64	1.02	50
2.4	—	2.67	1.02	76
7.2	95	2.69	1.02	101
15	95	2.69	1.02	101
15	110	2.74	1.07	152

PART B — Extra-High Voltages (based on switching-surge factors)<sup>2</sup>

<u>Column 1</u>	<u>Column A</u>	<u>Column B</u>	<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
Maximum design voltage between phases <del>(1)</del>	Switching-surge factor per unit <sup>4</sup> <del>(A)</del> <sup>+</sup>	Switching surge line to ground <sup>4</sup> <del>(B)</del> <sup>+</sup> kV	Vertical clearance of unguarded parts <sup>1</sup> <del>(2)</del> <sup>+</sup> m	Horizontal clearance of unguarded parts <sup>1</sup> <del>(3)</del> <sup>+</sup> m	Clearance guard to live parts <sup>1</sup> <del>(4)</del> <sup>+</sup> m
362 000	2.2 or below	650	4.7	3.0	2.13
	2.3	680	4.9	3.2	2.30
	2.4	709	5.0	3.4	2.45
	2.5	739	5.2	3.6	2.60
	2.6	768	5.4	3.7	2.80

PART C — Extra-High Voltages (based on BIL factors)<sup>2</sup>

<u>Column 1</u>	<u>Column C</u>	<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
Maximum design voltage between phases (+)	Basic impulse insulation level 5 (BIL) <sup>4</sup> (-) <sup>4</sup>	Vertical clearance of unguarded parts <sup>1</sup> (-) <sup>+</sup>	Horizontal clearance of unguarded parts <sup>1</sup> (-) <sup>+</sup>	Clearance guard to live parts <sup>1</sup> (-) <sup>+</sup>
	kV	m	m	m
362 000	1050	4.7	3.0	2.13
362 000	1300	5.2	3.6	2.60
550 000	1550	5.7	4.1	3.2

Table 124-1 (Continued) PART D — High Voltage Direct Current (Based on Transient Overvoltage)

<u>Column 1</u>	<u>Column A</u>	<u>Column B</u>	<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
Maximum design voltage conductor to ground	Transient overvoltage per unit <sup>4</sup> (A) <sup>+</sup>	Transient overvoltage line to grnd <sup>4</sup> (B) <sup>+</sup>	Vertical clearance of unguarded parts <sup>1</sup>	Horizontal clearance of unguarded parts <sup>1</sup>	Clearance guard to live parts <sup>1</sup>
kV		kV	m	m	m
250	1.5 or below	375	3.81	2.13	1.22
	1.6	400	3.89	2.22	1.30
	1.7	425	3.97	2.30	1.38
	1.8	450	4.05	2.38	1.46

1

Interpolate for intermediate values. The clearances in column 4 of this table are solely for guidance in installing guards without definite engineering design and are not to be considered as a requirement for such engineering design. For example, the clearances in the tables above are not intended to refer to the clearances between live parts and the walls of the cells, compartments, or similar enclosing structures. They do not apply to the clearances between bus bars and

supporting structures nor to clearances between the blade of a disconnecting switch and its base. However, where surge-protective devices are applied to protect the live parts, the vertical clearances, column 2 of Table 124-1 Part A may be reduced provided the clearance is not less than 2.6 m plus the electrical clearance between energized parts and ground as limited by the surge-protective devices.

2

Clearances shall satisfy either switching-surge or BIL duty requirements, whichever are greater.

3

Switching-Surge Factor—an expression of the maximum switching-surge crest voltage in terms of the maximum operating line-to-neutral crest voltage of the power system.

4

The values of columns A, B, and C are power system design factors that shall correlate with selected clearances. Adequate data to support these design factors should be available.

5

The selection of station BIL shall be coordinated with surge-protective devices when BIL is used to determine clearance. BIL—Basic Impulse Insulation Level—For definition and application, see IEEE Std 1313-1993.