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202, 608.8, 608.8.1, 608.8.1.1, Table 608.8.1.1(1), Table 608.8.1.1(2), Table 608.8.1.1(2), 608.8.1.2, 608.8.1.3, 608.8.2

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Delete definition without substitution:

~~**LOW VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER.** A NEMA 'Class 1' transformer that is air-cooled, does not use oil as a coolant, has an input voltage ≤ 600 volts, and is rated for operation at a frequency of 60 hertz.~~

Revise as follows:

608.8 Electrical system efficiency. Electrical systems shall comply with Sections 608.8.1 and 608.8.2.

608.8.1 ~~Prescriptive compliance~~ Voltage drop in feeders. ~~Prescriptive compliance for electrical systems shall be in accordance with Sections 608.8.1.1 through 608.8.1.3.~~ The voltage drop in feeder conductors shall not exceed 1.5 percent at design load.

~~**608.8.1.1 Transformer efficiency.** Distribution transformers installed on the load side of the service disconnecting means shall comply with the provisions of Tables 608.8.1.1(1), 608.8.1.1(2) and 608.8.1.1(3), and the Energy Policy Act of 2005 as applicable.~~

~~**Exception:** The following transformers are exempt from the efficiency standards of Section 608.8.1.1:~~

1. ~~Transformers not covered by the Energy Policy Act of 2005.~~
2. ~~Transformers for special purpose applications, and not used in general purpose applications.~~
3. ~~Transformers with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.~~
4. ~~Drive transformers, rectifier transformers, auto-transformers, uninterruptible power supply transformers, impedance transformers, regulating transformers, sealed and nonventilating transformers, machine tool transformers, welding transformers, grounding transformers, and testing transformers.~~

~~**TABLE 608.8.1.1(1)**~~
~~**LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS**~~
~~**(Maximum 600 Volt Primary)[a]**~~

~~SINGLE PHASE~~		~~THREE PHASE~~	
~~kVA Rating~~	~~Minimum Efficiency (%)~~	~~kVA Rating~~	~~Minimum Efficiency (%)~~
~~15~~	~~97.7~~	~~15~~	~~97.0~~
~~25~~	~~98.0~~	~~30~~	~~97.5~~
~~37.5~~	~~98.2~~	~~45~~	~~97.7~~
~~50~~	~~98.3~~	~~75~~	~~98.0~~
~~75~~	~~98.5~~	~~112.5~~	~~98.2~~
~~100~~	~~98.6~~	~~150~~	~~98.3~~

SINGLE PHASE		THREE PHASE	
167	98.7	225	98.5
250	98.8	300	98.6
333	98.9	500	98.7
—	—	750	98.8
—	—	1000	98.9

a. All efficiency values for low-voltage transformers are at 35 percent of nameplate-rated load, determined in accordance with the DOE test procedure. 10 CFR Part 431, Sub-part K, Appendix A.

TABLE 608.8.1.1(2)
MEDIUM-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS
(Maximum 34,500 Volt Primary, Maximum 600 Volt Secondary)[a]

SINGLE PHASE				THREE PHASE			
kVA Rating	20-45 kV BIL Minimum Efficiency (%)	46-95 kV BIL Minimum Efficiency (%)	>96 kV BIL Minimum Efficiency (%)	kVA Rating	20-45 kV BIL Minimum Efficiency (%)	46-95 kV BIL Minimum Efficiency (%)	>96 kV BIL Minimum Efficiency (%)
15	98.10	97.86	—	15	97.50	97.18	—
25	98.33	98.12	—	30	97.90	97.63	—
37.5	98.49	98.30	—	45	98.10	97.86	—
50	98.60	98.42	—	75	98.33	98.12	—
75	98.73	98.57	98.53	112.5	98.49	98.30	—
100	98.82	98.67	98.63	150	98.60	98.42	—
167	98.96	98.83	98.80	225	98.73	98.57	98.53
250	99.07	98.95	98.91	300	98.82	98.67	98.63
333	99.14	99.03	98.99	500	98.96	98.83	98.80
500	99.22	99.12	99.09	750	99.07	98.95	98.91
667	99.27	99.18	99.15	1000	99.14	99.03	98.99
833	99.31	99.23	99.20	1500	99.22	99.12	99.09
—	—	—	—	2000	99.27	99.18	99.15
—	—	—	—	2500	99.31	99.23	99.20

BIL = Basic impulse insulation level.

a. All efficiency values for medium-voltage transformers are at 50 percent of nameplate-rated load, determined in accordance with the DOE test procedure. 10 CFR Part 431, Sub-part K, Appendix A.

~~**TABLE 608.8.1.1(3)**~~
~~**MEDIUM-VOLTAGE LIQUID-IMMERSED**~~
~~**DISTRIBUTION TRANSFORMERS**~~
~~**(Maximum 34,500 Volt Primary, Maximum 600 Volt Secondary)**~~[a]

~~SINGLE PHASE~~		~~THREE PHASE~~	
~~kVA Rating~~	~~Minimum Efficiency (%)~~	~~kVA Rating~~	~~Minimum Efficiency (%)~~
~~10~~	~~98.62~~	~~15~~	~~98.36~~
~~15~~	~~98.76~~	~~30~~	~~98.62~~
~~25~~	~~98.91~~	~~45~~	~~98.76~~
~~37.5~~	~~99.01~~	~~75~~	~~98.91~~
~~50~~	~~99.08~~	~~112.5~~	~~99.01~~
~~75~~	~~99.17~~	~~150~~	~~99.08~~
~~100~~	~~99.23~~	~~225~~	~~99.17~~
~~167~~	~~99.25~~	~~300~~	~~99.23~~
~~250~~	~~99.32~~	~~500~~	~~99.25~~
~~333~~	~~99.36~~	~~750~~	~~99.32~~
~~500~~	~~99.42~~	~~1000~~	~~99.36~~
~~667~~	~~99.46~~	~~1500~~	~~99.42~~
~~883~~	~~99.49~~	~~2000~~	~~99.46~~
~~—~~	~~—~~	~~2500~~	~~99.49~~

~~a. All efficiency values for medium-voltage transformers are at 50 percent of nameplate-rated load, determined in accordance with the DOE test procedure. 10 CFR Part 431, Sub-part K, Appendix A.~~

~~**608.8.1.2 Voltage drop in feeders.** The voltage drop in feeder conductors shall not exceed 1.5 percent at design load.~~

~~**608.8.1.3**~~ **608.8.2 Voltage drop in branch circuits.** The voltage drop in branch circuit conductors shall not exceed 1.5 percent at design load.

Reason: CE329 AS added transformer efficiency standards to the IECC. Since these are included in the IECC they are no longer needed in the IgCC. No change has been proposed for the voltage drop requirements, just a renumbering of sections.

Cost Impact: Will not increase the cost of construction.

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