Public Review Draft

Proposed Addendum af to Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

**First Public Review (June 2024)
(Draft Shows Proposed Changes to Current Standard)**

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FOREWORD

The addendum modifies Section 10.4.1, covering electric motor efficiency, to align with DOE 10 CFR 431. DOE published a Federal Register direct final rule on June 1, 2023, pertaining to energy conservation standards for electric motors. In this direct final rule, DOE is adopting new and amended standards for electric motors. Starting on June 1, 2027, the efficiency of 100 to 250 horsepower (75 to 186 kilowatt) NEMA Design A motor, NEMA Design B motor, and IEC Design N (including NE, NEY, or NY variants) motor, but excluding fire pump electric motors and air-over electric motors, manufactured (alone or as a component of another piece of equipment) has been changed. DOE also has published the minimum efficiency of an air-over electric motor built in a standard frame size and specialized frame size of an air-over electric motor with a power rating from 1 horsepower to 20 horsepower.

DOE published the final rule on October 20, 2023, confirming the effective date and compliance date with the new standards established in the direct final rule, which is required on and after June 1, 2027.

Cost justification: This is a US DOE regulation.

[Note to Reviewers: This public review draft makes proposed independent substantive changes to the previous public review draft. These changes are indicated in the text by <u>underlining</u> (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the previous draft are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed substantive changes.]

Addendum af to 90.1-2022

Modify Section 3 as follows (I-P and SI):

<u>IEC Design NE:</u> <u>an electric motor that:</u>
<u>(1) Is an induction motor designed for use with three-phase power;</u>
<u>(2) Contains a cage rotor;</u>
<u>(3) Is capable of direct-on-line starting;</u>
<u>(4) Has 2, 4, 6, or 8 poles;</u>
<u>(5) Is rated from 0.12 kW to 1600 kW at a frequency of 60 Hz; and</u>
<u>(6) Conforms to Section 6.1, Table 3, and Section 6.3 of the IEC 60034–12:2016 specifications for starting torque, locked rotor apparent power, and starting requirements, respectively.</u>

<u>IEC Design NEY:</u> <u>an electric motor that:</u>
<u>(1) Is an induction motor designed for use with three-phase power;</u>
<u>(2) Contains a cage rotor;</u>
<u>(3) Is capable of star-delta starting;</u>
<u>(4) Has 2, 4, 6, or 8 poles;</u>

(5) Is rated from 0.12 kW to 1600 kW at a frequency of 60 Hz; and
(6) Conforms to Section 5.4, Table 3, and Section 6.3 of the IEC 60034–12:2016 specifications for starting torque, locked rotor apparent power, and starting requirements, respectively.

IEC Design NY: an electric motor that:
(1) Is an induction motor designed for use with three-phase power;
(2) Contains a cage rotor;
(3) Is capable of star-delta starting;
(4) Has 2, 4, 6, or 8 poles;
(5) Is rated from 0.12 kW to 1600 kW at a frequency of 60 Hz; and
(6) Conforms to Section 5.4, Section 6.2 and Section 6.3 of the IEC 60034–12:2016 specifications for starting torque, locked rotor apparent power, and starting requirements, respectively.

air-over electric motor: an electric motor that does not reach thermal equilibrium (i.e., thermal stability), during a rated load temperature test according to section 2 of appendix B, DOE 10 CFR 431, without the application of forced cooling by a free flow of air from an external device not mechanically connected to the motor within the motor enclosure.

specialized frame size: an electric motor frame size for which the rated output power of the motor exceeds the motor frame size limits specified for standard frame size. Specialized frame sizes have maximum diameters corresponding to the NEMA Frame Sizes shown in Table 10.8-9.

Modify Section 10.4.1 as follows (I-P and SI):

10.4.1 Electric Motors. Electric motors manufactured alone or as a component of another piece of equipment with a rated motor power of 1 hp or more, and less than or equal to ~~200~~750 hp (559 kW), shall comply with the requirements shown in Table 10.8-1 for NEMA Design A motors, NEMA Design B motors, and IEC Design N, NE, NEY, or NY motors, and Table 10.8-2 for NEMA Design C motors and IEC Design H motors. General purpose small electric motors with ~~an~~ rated motor power of 0.25 hp [.18 kW] or more, and less than or equal to 3 hp [2.2 kW], shall have a minimum average full-load efficiency that is not less than as shown in Table 10.8-3 for polyphase small electric motors and Table 10.8-4 for capacitor-start capacitor-run small electric motors and capacitor-start induction-run small electric motors.

Fire pump electric motors shall have a minimum nominal full-load efficiency ~~that is~~ not less than that shown in Table 10.8-5. Air-over electric motors shall have a minimum nominal full-load efficiency not less than that shown in Table 10.8-7 and Table 10.8-8.

Exception to 10.4.1: The standards in this section do not apply to the following exempt electric motors:
~~1. Air-over electric motors.~~
~~2~~1. Component sets of an electric motor.
~~3~~2. Liquid-cooled electric motors.
~~4~~3. Submersible electric motors.
~~5~~4. Inverter-only electric motors.

Modify Table 10.8-1 as follows (I-P):

Table 10.8-1 Minimum Nominal Full-Load Efficiency for NEMA Design A, NEMA Design B, and IEC Design N, NE, NEY, or NY Motors (Excluding Fire Pump Electric Motors) at 60 Hz[a,b,c].

Motor Horsepower, hp	Manufactured Date	Nominal Full-Load Efficiency, %							
		2-Pole		4-Pole		6-Pole		8-Pole	
		Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1	All	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5	All	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2	All	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3	All	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5	All	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5	All	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10	All	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15	All	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20	All	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25	All	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30	All	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40	All	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50	All	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60	All	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75	All	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100	On or before May 31, 2027	94.1	93.6	95.4	95.4	95.0	95.0	93.6	94.1
100	On or after June 1, 2027	95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
125	On or before May 31, 2027	95.0	94.1	95.4	95.4	95.0	95.0	94.1	94.1
125	On or after June 1, 2027	95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
150	On or before May 31, 2027	95.0	94.1	95.8	95.8	95.8	95.4	94.1	94.1
150	On or after June 1, 2027	95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
200	On or before May 31, 2027	95.4	95.0	96.2	95.8	95.8	95.4	94.5	94.1
200	On or after June 1, 2027	95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
250	On or before May 31, 2027	95.8	95.0	96.2	95.8	95.8	95.8	95.0	95.0
250	On or after June 1, 2027	96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4
300	All	95.8	95.4	96.2	95.8	95.8	95.8	NR	NR

350	All	95.8	95.4	96.2	95.8	95.8	95.8	NR	NR
400	All	95.8	95.8	96.2	95.8	NR	NR	NR	NR
450	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
500	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
550	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
600	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
650	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
700	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.

b. For purposes of determining the required minimum nominal full-load *efficiency* of an electric motor that has a horsepower or *kilowatt* rating between two horsepower or two *kilowatt* ratings listed in this table, each such motor shall be deemed to have a listed horsepower or *kilowatt* rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.

2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.

3. A *kilowatt* rating shall be directly converted from *kilowatts* to horsepower using the formula 1 *kilowatt* = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraph (1) or (2), whichever applies.

c. NR = no requirement.

Modify Table 10.8-1 as follows (SI):

Table 10.8-1 Minimum Nominal Full-Load Efficiency for NEMA Design A, NEMA Design B, and IEC Design N, NE, NEY, or NY Motors (Excluding Fire Pump Electric Motors) at 60 Hz[a,b,c].

Motor standard kilowatt equivalent, kW	Manufactured Date	Nominal Full-Load Efficiency, %							
		2-Pole		4-Pole		6-Pole		8-Pole	
		Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
0.75	All	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.1	All	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
1.5	All	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
2.2	All	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
3.7	All	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
5.5	All	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
7.5	All	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
11	All	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
15	All	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
18.5	All	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
22	All	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
30	All	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
37	All	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
45	All	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
55	All	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1

75	On or before May 31, 2027	94.1	93.6	95.4	95.4	95.0	95.0	93.6	94.1
	On or after June 1, 2027	95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
90	On or before May 31 1, 2027	95.0	94.1	95.4	95.4	95.0	95.0	94.1	94.1
	On or after June 1, 2027	95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
110	On or before May 31, 2027	95.0	94.1	95.8	95.8	95.8	95.4	94.1	94.1
	On or after June 1, 2027	95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
150	On or before May 31, 2027	95.4	95.0	96.2	95.8	95.8	95.4	94.5	94.1
	On or after June 1, 2027	95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
186	On or before May 31, 2027	95.8	95.0	96.2	95.8	95.8	95.8	95.0	95.0
	On or after June 1, 2027	96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4
224	All	95.8	95.4	96.2	95.8	95.8	95.8	NR	NR
261	All	95.8	95.4	96.2	95.8	95.8	95.8	NR	NR
298	All	95.8	95.8	96.2	95.8	NR	NR	NR	NR
336	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
373	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
410	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
447	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
485	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
522	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR
559	All	95.8	96.2	96.2	96.2	NR	NR	NR	NR

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.

b. For purposes of determining the required minimum nominal full-load *efficiency* of an electric motor that has a horsepower or *kilowatt* rating between two horsepower or two *kilowatt* ratings listed in this table, each such motor shall be deemed to have a listed horsepower or *kilowatt* rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.

2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.

3. A *kilowatt* rating shall be directly converted from *kilowatts* to horsepower using the formula 1 *kilowatt* = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraph (1) or (2), whichever applies.

c. NR = no requirement.

Add Table 10.8-7 as follows (I-P):

Table 10.8-7 Minimum Nominal Full-Load Efficiencies of NEMA Design A, NEMA Design B, and IEC Design N, NE, NEY or NY Standard Frame Size Air-Over Electric Motors (Excluding Fire Pump Electric Motors) at 60 Hz[a,b,c]

Motor Horsepower, hp	Manufactured Date	Nominal Full-Load Efficiency, %							
		2-Pole		4-Pole		6-Pole		8-Pole	
		Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1	On or after June 1, 2027	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5		84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2		85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3		86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5		88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5		89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10		90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15		91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20		91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25		91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30		91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40		92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50		93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60		93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75		93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100		95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
125		95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
150		95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
200		95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
250		96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.
b. For purposes of determining the required minimum nominal full-load *efficiency* of an electric motor that has a horsepower or *kilowatt* rating between two horsepower or two *kilowatt* ratings listed in this table, each such motor shall be deemed to have a listed horsepower or *kilowatt* rating, determined as follows:
  1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
  2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
  3. A *kilowatt* rating shall be directly converted from *kilowatts* to horsepower using the formula 1 *kilowatt* = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraph (1) or (2), whichever applies.

Add Table 10.8-7 as follows (SI):

Table 10.8-7 Minimum Nominal Full-Load Efficiencies of NEMA Design A, NEMA Design B, and IEC Design N, NE, NEY or NY Standard Frame Size Air-Over Electric Motors (Excluding Fire Pump Electric Motors) at 60 Hz[a,b,c]

Motor standard kilowatt equivalent, kW	Manufactured Date	Nominal Full-Load Efficiency, %							
		2-Pole		4-Pole		6-Pole		8-Pole	
		Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
.75		77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.1		84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
1.5		85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
2.2		86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
3.7		88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
5.5		89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
7.5		90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
11		91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
15		91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
18.5	On or after June 1, 2027	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
22		91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
30		92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
37		93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
45		93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
55		93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
75		95.0	94.5	96.2	96.2	95.8	95.8	94.5	95.0
90		95.4	94.5	96.2	96.2	95.8	95.8	95.0	95.0
110		95.4	94.5	96.2	96.2	96.2	95.8	95.0	95.0
150		95.8	95.4	96.5	96.2	96.2	95.8	95.4	95.0
186		96.2	95.4	96.5	96.2	96.2	96.2	95.4	95.4

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.
b. For purposes of determining the required minimum nominal full-load *efficiency* of an electric motor that has a horsepower or *kilowatt* rating between two horsepower or two *kilowatt* ratings listed in this table, each such motor shall be deemed to have a listed horsepower or *kilowatt* rating, determined as follows:
    1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
    2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
    3. A *kilowatt* rating shall be directly converted from *kilowatts* to horsepower using the formula 1 *kilowatt* = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraph (1) or (2), whichever applies.

Add Table 10.8-8 as follows (I-P):

Table 10.8-8 Minimum Nominal Full-Load Efficiencies of NEMA Design A, NEMA Design B and IEC Design N, NE, NEY or NY *Specialized Frame Size* Air-Over Electric Motors (Excluding Fire Pump Electric Motors) at 60 Hz[a,b,c].

Motor Horsepower, hp	Manufactured Date	Nominal Full-Load Efficiency, %							
		2-Pole		4-Pole		6-Pole		8-Pole	
		Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1	On or after June 1, 2027	74.0	NR	82.5	82.5	80.0	80.0	74.0	74.0
1.5		82.5	82.5	84.0	84.0	85.5	84.0	77.0	75.5
2		84.0	84.0	84.0	84.0	86.5	85.5	82.5	85.5
3		85.5	84.0	87.5	86.5	87.5	86.5	84.0	86.5
5		87.5	85.5	87.5	87.5	87.5	87.5	85.5	87.5
7.5		88.5	87.5	89.5	88.5	89.5	88.5	85.5	88.5
10		89.5	88.5	89.5	89.5	89.5	90.2	NR	NR
15		90.2	89.5	91.0	91.0	NR	NR	NR	NR
20		90.2	90.2	91.0	91.0	NR	NR	NR	NR

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.
b. For purposes of determining the required minimum nominal full-load *efficiency* of an electric motor that has a horsepower or *kilowatt* rating between two horsepower or two *kilowatt* ratings listed in this table, each such motor shall be deemed to have a listed horsepower or *kilowatt* rating, determined as follows:
   1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
   2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
   3. A *kilowatt* rating shall be directly converted from *kilowatts* to horsepower using the formula 1 *kilowatt* = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraph (1) or (2), whichever applies.
c. NR = no requirement.

Add Table 10.8-8 as follows (SI):

Table 10.8-8 Minimum Nominal Full-Load Efficiencies of NEMA Design A, NEMA Design B and IEC Design N, NE, NEY or NY *Specialized Frame Size* Air-Over Electric Motors (Excluding Fire Pump Electric Motors) at 60 Hz[a,b,c].

Motor standard kilowatt equivalent, kW	Manufactured Date	Nominal Full-Load Efficiency, %							
		2-Pole		4-Pole		6-Pole		8-Pole	
		Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
.75	On or after June 1, 2027	74.0	NR	82.5	82.5	80.0	80.0	74.0	74.0
1.1		82.5	82.5	84.0	84.0	85.5	84.0	77.0	75.5
1.5		84.0	84.0	84.0	84.0	86.5	85.5	82.5	85.5
2.2		85.5	84.0	87.5	86.5	87.5	86.5	84.0	86.5
3.7		87.5	85.5	87.5	87.5	87.5	87.5	85.5	87.5

5.5		88.5	87.5	89.5	88.5	89.5	88.5	85.5	88.5
7.5		89.5	88.5	89.5	89.5	89.5	90.2	NR	NR
11		90.2	89.5	91.0	91.0	NR	NR	NR	NR
15		90.2	90.2	91.0	91.0	NR	NR	NR	NR

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.

b. For purposes of determining the required minimum nominal full-load *efficiency* of an electric motor that has a horsepower or *kilowatt* rating between two horsepower or two *kilowatt ratings* listed in this table, each such motor shall be deemed to have a listed horsepower or *kilowatt* rating, determined as follows:

  1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
  2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
  3. A *kilowatt* rating shall be directly converted from *kilowatts* to horsepower using the formula 1 *kilowatt* = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraph (1) or (2), whichever applies.

c. NR = no requirement.

Add Table 10.8-9 as follows (I-P and SI):

Table 10.8-9: Maximum NEMA Specialized Frame Sizes of Air-Over Electric Motors

Motor Horsepower, hp	Maximum NEMA Specialized Frame Sizes							
	2-Pole		4-Pole		6-Pole		8-Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1	48	NR	48	48	48	48	140	140
1.5	48	48	48	48	140	140	140	140
2	48	48	48	48	140	140	180	180
3	140	48	140	140	180	180	180	180
5	140	140	140	140	180	180	210	210
7.5	180	140	180	180	210	210	210	210
10	180	180	180	180	210	210	N/A	N/A
15	210	180	210	210	N/A	N/A	N/A	N/A
20	210	210	210	210	N/A	N/A	N/A	N/A