

## DEPARTMENT OF ENERGY

## 10 CFR Part 431

[Docket No. EERE-2008-BT-TP-0008]

RIN 1904-AB71

**Energy Conservation Program: Test Procedures for Electric Motors and Small Electric Motors**

**AGENCY:** Office of Energy Efficiency and Renewable Energy, Department of Energy.

**ACTION:** Supplemental notice of proposed rulemaking.

**SUMMARY:** This supplemental notice of proposed rulemaking (SNOPR) proposes to clarify certain terms and language in our regulations for certain commercial and industrial equipment, as follows: revise the definitions of certain terms related to electric motors and small electric motors, clarify the scope of energy conservation standards for electric motors, update references to several industry and testing standards for electric motors, incorporate by reference and update alternative test methods for polyphase and single-phase small electric motors, and specify the determination of efficiency requirements for small electric motors. These actions are being proposed to clarify the scope of regulatory coverage for small electric motors and electric motors and ensure the accurate and consistent measurement of energy efficiency. This notice invites comments on U.S. Department of Energy (DOE) proposals and the issues presented herein, and requests comments, data, and other information that would enable DOE to promulgate a final rule.

**DATES:** DOE will accept comments, data, and information regarding the SNOPR until February 4, 2011. See section IV, "Public Participation," of this supplemental proposed rule for details.

**ADDRESSES:** Any comments submitted must identify the SNOPR on Test Procedures for Electric Motors and provide the docket number EERE-2008-BT-TP-0008 and/or Regulation Identifier Number (RIN) 1904-AB71. Comments may be submitted using any of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments.

- *E-mail:* [small\\_electric\\_motors\\_tp.rulemaking@ee.doe.gov](mailto:small_electric_motors_tp.rulemaking@ee.doe.gov). Include the docket number EERE-2008-BT-TP-0008 and/or RIN 1904-AB71 in the subject line of the message.

- *Postal Mail:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE-2J,

1000 Independence Avenue, SW., Washington, DC 20585-0121. Please submit one signed paper original. Due to the potential delays in DOE's receipt and processing of mail sent through the U.S. Postal Service, DOE encourages respondents to submit comments electronically to ensure timely receipt.

- *Hand Delivery/Courier:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024. Telephone: (202) 586-2945. Please submit one signed paper original.

For detailed instructions on submitting comments and additional information on the rulemaking process, see section IV, "Public Participation," of this document.

*Docket:* For access to the docket to read background documents or comments received, visit the U.S. Department of Energy, Sixth Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, (202) 586-2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Please call Ms. Brenda Edwards at (202) 586-2945 for additional information about visiting the Resource Room.

**FOR FURTHER INFORMATION CONTACT:** Mr. James Raba, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, EE-2J, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 586-8654. E-mail: [Jim.Raba@ee.doe.gov](mailto:Jim.Raba@ee.doe.gov). In the Office of the General Counsel, contact Ms. Ami Grace-Tardy, U.S. Department of Energy, Office of the General Counsel, GC-71, 1000 Independence Avenue, SW., Washington, DC 20585. Telephone: (202) 586-5709. E-mail: [Ami.Grace-Tardy@hq.doe.gov](mailto:Ami.Grace-Tardy@hq.doe.gov).

For information about how to submit or review public comments, contact Ms. Brenda Edwards, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, EE-2J, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 586-2945. E-mail: [Brenda.Edwards@ee.doe.gov](mailto:Brenda.Edwards@ee.doe.gov).

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## I. Introduction

### A. Authority

Part A–1 of Title III of the Energy Policy and Conservation Act, as amended (EPCA), provides the Department of Energy (“DOE” or, in context, “the Department”) with the authority to promulgate energy conservation standards and related test procedures for certain commercial and industrial equipment. (42 U.S.C. 6311–6317) This supplemental notice of proposed rulemaking addresses issues raised in response to an earlier notice of proposed rulemaking, 73 FR 78220 (December 22, 2008).

### B. Background

In the Energy Policy Act of 1992, Public Law 102–486 (October 24, 1992) (EPAAct 1992), Congress amended EPCA to establish energy conservation standards, test procedures, compliance certification, and labeling requirements for certain electric motors.<sup>1</sup> In addition, EPAAct 1992 directed the Secretary of Energy to determine whether energy conservation standards for small electric motors would be technologically feasible and economically justified, and would result in significant energy savings.<sup>2</sup> On October 5, 1999, DOE published in the **Federal Register**, a final rule that set forth procedures to determine the energy efficiency of electric motors. 64 FR 54114. After determining that energy conservation

standards for small electric motors would be technologically feasible and economically justified, *see* 71 FR 38799 (July 10, 2006), DOE initiated a rulemaking to begin the development of standards for small electric motors.<sup>3</sup> Related to these efforts was DOE’s publication of a July 7, 2009 final rule prescribing test procedures for small electric motors. 74 FR 32059. Today’s supplemental notice of proposed rulemaking (SNOPR) proposes revisions, as summarized below, to the test procedures and definitions related to electric motors and small electric motors that were not addressed in previous rulemakings.

#### 1. Electric Motors

Section 343(a)(5)(A) of EPCA requires that test procedures for electric motor efficiency shall be the test procedures specified in the National Electrical Manufacturers Association (NEMA) Standards Publication MG1–1987 and IEEE Standard 112 Test Method B for electric motor efficiency, as in effect on the date of enactment of EPAAct 1992. (42 U.S.C. 6314(a)(5)(A)) Section 343(a)(5)(B) of EPCA directs that if the NEMA and IEEE test procedures are amended, the Secretary of Energy shall amend the efficiency test procedures for electric motors to conform to the amended NEMA and IEEE test procedures, unless the Secretary determines, by rule, that amended procedures are not reasonably designed to produce results that reflect energy efficiency, energy use, and estimated operating costs, and would be unduly burdensome to conduct. (42 U.S.C. 6314(a)(5)(B)) Subsequently, once newer versions of these industry test procedures became available, DOE amended its regulations to include more recent versions of these procedures. MG1–1993 and IEEE Standard 112–1996 were codified at 10 CFR 431.22 (now codified at 10 CFR 431.16 and appendix B to subpart B). In addition, the equivalent CAN/CSA C390–93, “Energy Efficiency Test Methods for Three-Phase Induction Motors” was added in the final rule published on October 5, 1999. 64 FR 54114. These changes were made

to ensure that the latest industry practices were incorporated into DOE’s regulations and to incorporate related equivalent procedures.

NEMA Standards Publication MG1 was most recently revised and published on April 9, 2010, IEEE Standard 112 was most recently amended in November 2004, and CAN/CSA C390 was most recently amended on March 22, 2010 (as the renamed “Test methods, marking requirements, and energy efficiency levels for three-phase induction motors.”) As directed by section 343(a)(5)(B) of EPCA, DOE proposed in a December 22, 2008, test procedure notice of proposed rulemaking (NOPR) (December 2008 NOPR) to update the test procedures in 10 CFR part 431 by incorporating by reference the test methods from the most current versions (at that time) of those industry testing standards. 73 FR 78220. DOE received several comments on its proposed updates as well as on other issues and is addressing them in today’s SNOPR for further public review.

#### 2. Small Electric Motors

Section 346 of EPCA requires DOE to prescribe test procedures for those small electric motors for which the Secretary of Energy makes a positive determination that energy conservation standards would be technologically feasible and economically justified, and would result in significant energy savings. (42 U.S.C. 6317(b)(1)) Consistent with this requirement, DOE announced its intention in the determination notice to initiate the development of test procedures for certain small electric motors. 71 FR 38807 (July 10, 2006).

Pursuant to section 346(b)(1) of EPCA, in the December 2008 NOPR, DOE presented potential test methods for measuring the energy efficiency of small electric motors that DOE was considering incorporating into its regulations. 73 FR 78220. DOE proposed to base its test procedure on IEEE Standard 114–2001, “Test Procedure for Single-Phase Induction Motors,” IEEE Standard 112–2004, “Test Procedure for Polyphase Induction Motors and Generators,” and Canadian Standards Association (CAN/CSA) C747–94, “Energy Efficiency Test Methods for Single- and Three-Phase Small Motors.”<sup>4</sup> All of these testing standards are industry-based test procedures that

<sup>1</sup> EPCA, as amended by EPAAct 1992, had previously defined an “electric motor” as “any motor which is a general purpose T-frame, single-speed, foot-mounting, polyphase squirrel-cage induction motor of the National Electrical Manufacturers Association, Design A and B, continuous rated, operating on 230/460 volts and constant 60 Hertz line power as defined in NEMA Standards Publication MG1–1987.” (42 U.S.C. 6311(13)(A) (1992)) Through subsequent amendments to EPCA, Congress removed this definition and replaced it with language denoting two new subtypes of general purpose electric motors. (*See* 42 U.S.C. 6311(13)(A)–(B) (2010))

<sup>2</sup> EPCA, as amended by EPAAct 1992, defines the term “small electric motor” to mean a “NEMA general purpose alternating current single-speed induction motor, built in a two-digit frame number series in accordance with NEMA Standards Publication MG1–1987.” (42 U.S.C. 6311(13)(G))

<sup>3</sup> A single-phase small electric motor is a rotating electrical machine that operates on single-phase electrical power, which refers to a single alternating voltage sinusoidal waveform. Similarly, a polyphase small electric motor is a rotating electrical machine that operates on three-phase electrical power, which refers to the sinusoidal waveforms of three supply conductors that are offset from one another by 120 degrees. Small electric motors are generally used as components to drive commercial and industrial pumps, fans, conveyors, and other equipment that require low power (*i.e.*, approximately 3 horsepower and below). 73 FR 78220, 78221 n.2 (December 22, 2008)

<sup>4</sup> The IEEE Standards addressed in this notice are generally listed chronologically by their last date of revision and adoption rather than their sequential number.

are well-known and commonly used by small electric motor manufacturers.

On July 7, 2009, DOE published a final rule adopting test procedures for measuring the energy efficiency of small electric motors. 74 FR 32059. However, there were certain subsidiary issues raised in the December 2008 NOPR that required additional consideration before a final decision could be made on how to address them in light of comments received from interested parties. These issues are addressed in today's SNOPR.

**II. Summary of Supplemental Notice of Proposed Rulemaking**

Today's SNOPR addresses and solicits comment on particular issues concerning definitions and test procedures for electric motors and small electric motors. DOE prepared this SNOPR to ensure clarity in the definitions and test procedures for electric motors and small electric motors and to address public comments received in response to the December NOPR.

With respect to electric motors, DOE proposes to take four actions. First, DOE proposes to clarify definitions for the terms "electric motor," "fire pump motor," "general purpose electric motor (subtype I)," "general purpose electric motor (subtype II)," and "NEMA Design B." In addition, DOE proposes to rename the term "general purpose motor" to be "general purpose electric motor" consistent with terminology used in the regulations. DOE believes that the proposed revisions to these terms will

make the applicable test procedures contained in 10 CFR part 431 appropriate for this equipment while addressing comments from interested parties submitted in response to the December 2008 NOPR. Second, today's notice proposes to clarify the scope of existing and pending energy conservation standards for electric motors in 10 CFR 431.25. Third, DOE proposes to update the references to NIST Handbook 150-10, "Efficiency of Electric Motors," and the associated NIST Handbook 150-10 Checklist, IEC standards documents, CAN/CSA C390, and NEMA MG1 throughout subpart B of 10 CFR part 431. Fourth, DOE proposes revisions to appendix A to subpart B, of 10 CFR part 431, to maintain consistency with the Energy Independence and Security Act (EISA 2007) amendments to the electric motor scope of coverage, and to address acceptable bounds for shaft dimensions for covered general purposes electric motors.

With respect to small electric motors, on July 7, 2009, DOE published a final rule that prescribed test procedures to measure the energy efficiency of small electric motors (July 2009 final rule). 74 FR 32059. Today's SNOPR addresses three related matters that would clarify the scope of coverage and alleviate potential undue testing burdens.

First, DOE proposes to define the represented efficiency value and average full load efficiency for small electric motors.

Second, DOE proposes to include the following test procedures as alternative methodologies for measuring the energy efficiency of polyphase small electric motors: CAN/CSA C747 and CAN/CSA C390. DOE understands that both test methods are equivalent to IEEE Standard 112 Test Methods A and B, respectively, which were adopted in the July 2009 final rule. DOE is also updating existing references to CAN/CSA C747 to the latest version of the standard.

Finally, DOE proposes a method to validate an alternative efficiency determination method (AEDM) for small electric motors, including the statistical requirements to substantiate the AEDM. While the AEDM was addressed in the December 2008 NOPR, comments to that notice indicated that the agency needed to provide additional clarification regarding how manufacturers should use the sample of basic models tested when validating their AEDMs. Today's notice clarifies that issue by proposing an approach based on the AEDM substantiation requirements for 1-200 horsepower electric motors.

The proposed revisions are summarized in the table below and addressed in detail in the following section. Note that all citations to various sections of 10 CFR part 431 throughout this SNOPR preamble refer to the current version of 10 CFR part 431. The proposed regulatory text follows the preamble to this notice. DOE seeks comments from interested parties on each of the proposed revisions.

TABLE 1—SUMMARY OF CHANGES PROPOSED IN THIS SNOPR AND AFFECTED SECTIONS OF 10 CFR PART 431

Existing Section in 10 CFR Part 431	Summary of Proposed Modifications
Section 431.11 of Subpart B—Purpose and Scope .....	<ul style="list-style-type: none"> <li>Clarifies that subpart B is applicable to "electric motors," but not "small electric motors."</li> </ul>
Section 431.12 of Subpart B—Definitions .....	<ul style="list-style-type: none"> <li>Revises the definitions of "accreditation," "definite purpose motor," "general purpose electric motor (subtype I)," "general purpose electric motor (subtype II)," and "nominal full load efficiency."</li> </ul>
Section 431.14 of Subpart B— Sources for information and guidance ...	<ul style="list-style-type: none"> <li>Adds new definitions for "electric motor," "fire pump motor," "general purpose electric motor," and "NEMA Design B motor."</li> </ul>
Section 431.15 of Subpart B—Materials incorporated by reference .....	<ul style="list-style-type: none"> <li>Removes definition of "general purpose motor."</li> </ul>
Section 431.18 of Subpart B—Testing Laboratories .....	<ul style="list-style-type: none"> <li>Removes sources for information and guidance from Section 431.15 and places it in new Section 431.14.</li> </ul>
Section 431.19 of Subpart B—Department of Energy recognition of accreditation bodies.	<ul style="list-style-type: none"> <li>Updates reference to CAN/CSA-C390.</li> </ul>
Section 431.20 of Subpart B—Department of Energy recognition of nationally recognized certification programs.	<ul style="list-style-type: none"> <li>Updates references to IEC standards.</li> </ul>
Section 431.25 of Subpart B—Energy conservation standards and effective dates.	<ul style="list-style-type: none"> <li>Updates reference to IEEE 112.</li> </ul>
Section 431.31 of Subpart B—Labeling Requirements .....	<ul style="list-style-type: none"> <li>Updates reference to NEMA MG1.</li> </ul>
Appendix A to Subpart B—Policy Statement for Electric Motors Covered Under the Energy Policy and Conservation Act.	<ul style="list-style-type: none"> <li>Updates reference to NIST Handbook 150-10.</li> </ul>
	<ul style="list-style-type: none"> <li>Updates references to IEEE 112 and CAN/CSA-C390 for electric motors.</li> </ul>
	<ul style="list-style-type: none"> <li>Clarifies the scope of efficiency standards in 431.25(a) through (e).</li> </ul>
	<ul style="list-style-type: none"> <li>Inserts kilowatt equivalent power ratings in the efficiency standard tables.</li> </ul>
	<ul style="list-style-type: none"> <li>Updates reference to NEMA MG1.</li> </ul>
	<ul style="list-style-type: none"> <li>Revised for consistency with EISA 2007 amendments.</li> </ul>

TABLE 1—SUMMARY OF CHANGES PROPOSED IN THIS SNOPT AND AFFECTED SECTIONS OF 10 CFR PART 431—  
Continued

Existing Section in 10 CFR Part 431	Summary of Proposed Modifications
Appendix B to Subpart B—Uniform Test Method for Measuring Nominal Full Load Efficiency of Electric Motors. Section 431.441 of Subpart X—Purpose and Scope .....	<ul style="list-style-type: none"> <li>• Includes guidance regarding special shaft designs for motors.</li> <li>• Updates references to NEMA MG1, IEEE 112, and CAN/CSA C390.</li> </ul>
Section 431.443 of Subpart X—Materials incorporated by reference .....	<ul style="list-style-type: none"> <li>• Clarifies that subpart X is applicable to “small electric motors,” but not “electric motors.”</li> <li>• Updates reference to CAN/CSA-C747.</li> <li>• Adds reference to CSA-C390.</li> <li>• Updates references to IEEE 112 and 114.</li> <li>• Updates reference to CAN/CSA-C747.</li> </ul>
Section 431.444 of Subpart X—Test procedures for measurement of energy efficiency.	<ul style="list-style-type: none"> <li>• Adds reference to CAN/CSA-C390.</li> </ul>
Section 431.445 of Subpart X—Determination of small electric motor efficiency.	<ul style="list-style-type: none"> <li>• Adds additional guidelines on use of a certification program and references section 431.447 for small electric motors.</li> <li>• Defines the represented efficiency value.</li> </ul>
Section 431.447 of Subpart X—Department of Energy recognition of nationally recognized certification programs.	<ul style="list-style-type: none"> <li>• Adds a section on nationally recognized certification programs for small electric motors similar to section 431.20 for electric motors.</li> </ul>
Section 431.448 of Subpart X—Procedures for recognition and withdrawal of recognition of certification programs.	<ul style="list-style-type: none"> <li>• Adds a section on procedures for recognition of certification programs for small electric motors similar to section 431.21 for electric motors.</li> </ul>

### III. Discussion

#### A. Definition of Electric Motor

Before the enactment of EISA 2007, section 340(13)(A) of EPCA, as amended, defined the term “electric motor” as “any motor which is a general purpose T-frame, single-speed, foot-mounting, polyphase squirrel-cage induction motor of the National Electrical Manufacturers Association, Design A and B, continuous rated, operating on 230/460 volts and constant 60 Hertz line power as defined in NEMA Standards Publication MG1–1987.” Section 313(a)(2) of EISA 2007 struck that definition and established two subtypes: General purpose electric motor (subtype I) and general purpose electric motor (subtype II). (42 U.S.C. 6311(13)) In addition, section 313(b)(2) of EISA 2007 established energy conservation standards for four types of motors: General purpose electric motor (subtype I) with a power rating of 1 to 200 horsepower; fire pump motors; general purpose electric motor (subtype II) with a power rating of 1 to 200 horsepower; and NEMA Design B, general purpose electric motors with a power rating of more than 200 horsepower to 500 horsepower. (42 U.S.C. 6313(b)(2)) All of these standards apply to covered motors that are manufactured alone or as a component of another piece of equipment. The term “electric motor” (which frequently appears throughout EPCA, as amended by EISA, and various subparts of 10 CFR part 431) was left undefined. Consequently, DOE expressed concern that the absence of a definition may cause confusion about which electric motors are required to comply with

mandatory test procedures and energy conservation standards. 73 FR 78225.

In the December 2008 NOPR, DOE proposed to clarify the EISA definition of “electric motor” to mean any of the following four types of motors: A general purpose electric motor (subtype I), a fire pump motor, a general purpose electric motor (subtype II), or a NEMA Design B general purpose electric motor. 73 FR 78225 and 78235. In DOE’s view, applying the term “electric motor” in this manner would clarify that the test procedures prescribed for electric motors would equally apply to each of the four types of motors. 73 FR 78225.

Whereas DOE proposed to separate (and define) the covered electric motors into four distinct and separate types, NEMA asserted that section 313(a)(2) of EISA 2007 categorized covered electric motors into two types: General purpose electric motor (subtype I) and general purpose electric motor (subtype II). Further, NEMA commented that under the DOE-proposed definition of electric motor, a NEMA Design B general purpose electric motor and a fire pump motor would be viewed as separate and apart from general purpose electric motor (subtype I), when in reality they are considered subsets of general purpose electric motors (subtype I). (NEMA, No. 12 at p. 7)<sup>5</sup>

<sup>5</sup> Notations of this form appear throughout this document and identify statements made in written comments or at public hearings that DOE has received and has included in the docket for this rulemaking. For example, “NEMA, No. 12 at p. 7” refers to a comment: (1) From the National Electrical Manufacturers Association; (2) in document number 12 in the docket of this rulemaking; and (3) appearing on page 7 of the submission.

In view of the above and with the term “electric motor” as yet unclear, today’s SNOPT proposes to clarify the term “electric motor” to mean “a machine which converts electrical power into rotational mechanical power.” Additionally, as discussed below, DOE is proposing to clarify what constitutes a “general purpose electric motor (subtype I)” by enumerating certain design and performance elements, and what constitutes a “general purpose electric motor (subtype II)” by explicitly drawing the distinction between a subtype I and subtype II.

#### B. Definition of General Purpose Electric Motors, Subtypes I and II

EISA 2007 defines a general purpose electric motor (subtype I) as a motor that meets the definition of “general purpose” which was in effect at the time of enactment of EISA 2007. At that time, 10 CFR part 431 did not contain a definition of “general purpose,” although the regulations did define “general purpose motor” as a motor designed in standard ratings with either:

(1) Standard operating characteristics and standard mechanical construction for use under usual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.02, “Usual Service Conditions,” and without restriction to a particular application or type of application; or

(2) Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.03, “Unusual Service conditions,” or for a particular type of application, and which can be used in most general purpose applications.

64 FR 54142 (codified at 10 CFR 431.12).

DOE subsequently adopted this definition of “general purpose motor” as the definition of “general purpose electric motor (subtype I).” 74 FR 12058, 12071 (March 23, 2009) (codified at 10 CFR 431.12) In the December 2008 NOPR, DOE did not propose any changes to the definition of “general purpose electric motor (subtype I).”

DOE also did not propose any changes to the definition of “general purpose electric motor (subtype II)” in the December 2008 NOPR because this term was defined in section 313(a)(2) of EISA 2007 and was incorporated without modification into 10 CFR 431.12. 74 FR 12071. The statute defines a subtype II general purpose motor as any motor incorporating the design elements of a general purpose electric motor (subtype I) configured as one of the following:

- (i) A U-frame motor;
- (ii) A Design C motor;
- (iii) A close-coupled pump motor;
- (iv) A footless motor;
- (v) A vertical solid shaft normal thrust motor (as tested in a horizontal configuration);
- (vi) An 8-pole motor (900 rpm); or
- (vii) A polyphase motor with voltage of not more than 600 volts (other than 230 or 460 volts).

(42 U.S.C. 6311(13)(B))

In response to the December 2008 NOPR, NEMA and Baldor commented that Congress created confusion when it struck the EPCA 1992 definition of electric motor from section 340(13)(A) of EPCA via section 313(a)(2) of EISA 2007 and subsequently inserted the terms “general purpose electric motor (subtype I)” and “general purpose electric motor (subtype II)” under the umbrella heading “Electric motor” without further clarification. According to NEMA and Baldor, the DOE definition of general purpose electric motor (subtype I) does not provide the essential elements that would differentiate a general purpose electric motor (subtype II) from a general purpose electric motor (subtype I)—the subtype II characteristics described in the statute are also shared with subtype I motors. Consequently, NEMA requested that DOE clarify how it intends to distinguish between a general purpose electric motor (subtype I) and general purpose electric motor (subtype II), particularly because EISA 2007 prescribes different efficiency levels for subtype I and subtype II motors. Further, Baldor suggested that DOE restore the original [EPCA 1992] definition of electric motor, which was struck by the EISA 2007 amendment to EPCA, and from that [EPCA 1992]

definition derive clear definitions to differentiate general purpose electric motor (subtype I) and (subtype II). (NEMA, No. 12 at p. 11; Baldor, Public Meeting Transcript, No. 8 at 116–119)

In addition, NEMA commented that section 313(a)(2) of EISA 2007 defines a general purpose electric motor (subtype II) as one that incorporates the design elements of a subtype I general purpose electric motor and that is “configured as 1 of several distinct configurations, such as “Design C” or “U-Frame” construction. (codified at 42 U.S.C. 6311(13)(A)–(B)). NEMA asked DOE to clarify how it would interpret the clause “configured as 1 of” in EISA 2007’s definition of general purpose electric motor (subtype II). Otherwise, according to NEMA, it is possible that a general purpose motor could be configured in a manner that uses combinations of the various configurations specified by EISA 2007, that is, a Design C motor could be constructed in a U-frame. (NEMA, No. 12 at p. 11)

In view of the above, DOE proposes first to clarify the definition of “electric motor” by describing what an electric motor is and what it does, rather than listing categories of covered electric motors. Second, DOE proposes to clarify the definition of “general purpose electric motor (subtype I)” by specifying certain design and performance elements. Third, DOE proposes to clarify the relationship between a general purpose electric motor subtype I and a general purpose electric motor subtype II.

NEMA commented that the definition of “general purpose electric motor (subtype I)” in the December 2008 NOPR is confusing because the only identifying characteristic is that the motor is “constructed for use in general purpose applications or can be used in most general purpose applications.” Further, NEMA asserted that design characteristics (such as T-frame, single speed, foot-mounting, polyphase, squirrel-cage induction motor, Design A and B, continuous rated, operating on 230/460 volts or constant 60 Hertz line power, *etc.*), which were essential elements under the EPCA 1992 definition of “electric motor,” are not included in the EISA 2007 definition. In addition, NEMA commented that when [in 1999] DOE originally codified regulations for electric motors into 10 CFR part 431, it determined that motors designed in accordance with IEC standards, and which could be used in the same general purpose applications as NEMA motors, be included as covered equipment. 61 FR 60442–43, 60449–50 (November 27, 1996) and 64 FR 54131. Whereas the definition for

“general purpose electric motor (subtype I),” proposed in the December 2008 NOPR, failed to include IEC motors of similar design and use, NEMA requested that DOE explicitly include equivalent IEC motors as covered equipment. (NEMA, No. 12 at pp. 9 and 11)

In view of the above comments, DOE is proposing to clarify what constitutes a “general purpose electric motor (subtype I)” by referencing the enumerated design and performance elements under the definition of “electric motor,” set forth in EPCA, as amended by EPCA 1992 and codified in 10 CFR 431.2 (January 1, 2000). DOE would also include references to IEC standards to clarify that IEC-equivalent electric motors are subject to energy conservation standards. DOE requests comment on the following proposed definition for “general purpose electric motor (subtype I)”:

*General purpose electric motor (subtype I)* means a general purpose electric motor that:

- (1) Is a single-speed induction motor (MG1);
- (2) Is rated for continuous duty (MG1) operation or for duty type S1 (IEC);
- (3) Contains a squirrel-cage (MG1) or cage (IEC) rotor;
- (4) Has foot-mounting that may include foot-mounting with flanges or detachable feet;
- (5) Is built in accordance with NEMA T-frame dimensions (MG1) or their IEC metric equivalents (IEC);
- (6) Has performance in accordance with NEMA Design A (MG1) or B characteristics or equivalent designs such as IEC Design N (IEC);
- (7) Operates on polyphase alternating current 60-hertz sinusoidal power, and:
  - (i) Is rated 230 or 460 volts (or both) including motors rated at multiple voltages that include 230 or 460 volts (or both), or
  - (ii) Can be operated on 230 or 460 volts (or both); and
- (8) Includes, but is not limited to, explosion-proof construction.

Terms in this definition followed by the parenthetical “MG1” must be construed with reference to provisions in NEMA Standards Publication MG1–2009 and elements followed by the parenthetical “IEC” must be construed with reference to the IEC Standards. 10 CFR part 431, subpart B applies to general purpose electric motors (subtype I) even if the NEMA or IEC-equivalent frame size or design element has been discontinued or is discontinued in the future.

To be consistent with the proposed definition of “electric motor” and corresponding use of the term “general

purpose electric motor” in the definition of “general purpose electric motor (subtype I),” DOE proposes to amend the definition of “general purpose motor” in 10 CFR 431.12 by adding the word “electric” in front of the word “motor” to clarify that a general purpose motor is a type of electric motor. Furthermore, DOE proposes to update references to NEMA MG1, from NEMA MG1–1993 to NEMA MG1–2009 in this definition.

DOE distinguishes between a general purpose electric motor subtype I and subtype II based on whether the motor is configured to have one or more of the design or performance elements listed in the definition of general purpose electric motor (subtype II) at 42 U.S.C. 6311(13)(B). For example, a subtype I motor could be built in accordance with NEMA T-frame dimensions and could have the performance characteristics of a NEMA Design A motor. In contrast, a motor built with all of the same design elements as the above mentioned motor but with the performance characteristics of a NEMA Design C motor would be a subtype II motor. To clarify this interpretation of the statutory definition of “general purpose electric motor (subtype I),” DOE proposes to modify the introductory text of the definition to read, “means any general purpose electric motor that incorporates design elements of a general purpose electric motor (subtype I) but, unlike a general purpose electric motor (subtype II), is configured in one or more of the following ways.” For clarification, DOE is also proposing to add references to MG1 and IEC standards in the definition of “general purpose electric motor (subtype II)” to clarify the terms “U-frame,” “NEMA Design C,” and “vertical solid shaft normal thrust motor.”

Finally, DOE has received inquiries regarding whether motors designed in accordance with IEC standards are covered motors under EPCA, as amended by EISA, if there is no longer a NEMA MG1-equivalent design standard. Specifically, manufacturers are requesting guidance as to whether IEC 100 millimeter frame motors are covered motors under EPCA, as amended by EISA 2007, because the equivalent NEMA 160 frame size was discontinued as a standard NEMA frame. Before EISA 2007 was enacted, DOE addressed this question in the 1996 electric motors test procedure NOPR. 61 FR 60440, 60443 (November 27, 1996). At that time, DOE considered whether the proposed scenario was covered under the then-current definition of “electric motor.”<sup>6</sup> The Department

tentatively decided that the IEC 100 millimeter frame motor was not covered by EPCA because the “electric motor” definition required the motor to be a T-frame motor as defined in NEMA MG1–1987, but the NEMA T-frame motor that was equivalent to an IEC 100 millimeter frame motor had been discontinued.

DOE has reassessed this previous preliminary determination in light of the EISA 2007 amendment that struck the definition of “electric motor” relied upon in the above analysis, and today’s proposal to include references to IEC standards to clarify that IEC-equivalent electric motors are subject to energy conservation standards. Upon reconsideration of the issue, DOE proposes that IEC 100 millimeter frame motors, and other electric motors built to IEC standards, that otherwise meet the proposed definition of “general purpose electric motor (subtype I)” are covered motors under EPCA, even though the NEMA-equivalent frame size has been discontinued.

#### C. Definition of NEMA Design B Motor

In the December 2008 NOPR, DOE proposed to adopt a definition for the term “NEMA Design B, general purpose electric motor.” 73 FR 78235. This definition was based on the definition of general purpose electric motor in paragraph 1.19.1.2, “Design B,” of NEMA MG1–2006 Revision 1, with three changes. First the proposed definition removed the reference to 50 hertz and corresponding performance characteristics because the EISA 2007-prescribed efficiency standards for “NEMA Design B, general purpose electric motors” at 42 U.S.C. 6313(b)(2)(D) cover only 60-hertz motors. (See NEMA MG–1 (2006) Table 12–11) Second, it limited the maximum rated slip at rated load to less than 5 percent for motors with fewer than 10 poles, because the EISA 2007-prescribed energy conservation standards only cover 2-, 4-, 6-, and 8-pole motors and, according to the footnote to MG1–2006 paragraph 1.19.1.2, motors with 10 or more poles are permitted to have slip slightly greater than 5 percent. Third, it corrected the referenced 60-hertz locked-rotor current paragraph from 12.35.3 to 12.35.1, because there is no paragraph 12.35.3 in MG1–2006 and the table under paragraph 12.35.1 contains the maximum currents associated with a locked rotor.

which is a general purpose T-frame, single-speed, foot-mounting, polyphase squirrel-cage induction motor of the National Electrical Manufacturers Association, Design A and B, continuous rated, operating on 230/460 volts and constant 60 Hertz line power as defined in NEMA Standards Publication MG1–1987.”

Several interested parties expressed concern over DOE’s proposed definition for a NEMA Design B, general purpose electric motor. NEMA and Baldor urged DOE not to change the NEMA MG1 definition of Design B where it refers to MG1–12.35.[2] for 50 hertz, stating that the industry definition has existed for many years and should be maintained, and that EISA 2007 does not explicitly limit coverage to 60 hertz. (Baldor, Public Meeting Transcript, No. 8 at p. 159, NEMA, No. 12 at p. 10) NEMA also noted that Table 12–11 of NEMA MG1 (the applicable efficiency standards for NEMA Design B, general purpose electric motors) applies both to 60-hertz and 50-hertz rated motors. In sum, NEMA requested that DOE incorporate the definition of NEMA Design B, general purpose electric motor from NEMA MG1–2006 in its entirety and refer to paragraph 1.19.1.2 of NEMA MG1–2006. Notwithstanding this request, NEMA asserts that it is not condoning the inclusion of efficiency standards for 50-hertz motors in 10 CFR part 431. NEMA also commented that even though NEMA Design B motors are a subset of general purpose electric motor (subtype I), if DOE deems it necessary, NEMA would support adding a separate definition for NEMA Design B general purpose electric motor in § 431.12, as long as it was clearly classified as a general purpose electric motor (subtype I) with some specific characteristics. (NEMA, No. 12 at p. 10)

In addition, the Northwest Energy Efficiency Alliance (NEEA) agreed that it could see no benefit to making changes to an industry-wide and well-accepted definition for a NEMA Design B general purpose motor that includes 50-hertz motors and energy efficiency levels for 8-pole motors. NEEA recommended that DOE adopt the NEMA MG1 1.19.1.2 definition without amending it. (NEEA, No. 10 at pp. 2–3)

In response, due to the NEMA MG1 technical error in referencing section 12.35.3 for 60 Hz motors, DOE cannot simply adopt or reference the NEMA MG1 1.19.1.2 definition for Design B without any amendments, as suggested by NEMA and NEEA. Furthermore, it is common and within DOE’s authority to adopt a long-standing industry definition and adapt the definition to make it more precise for regulatory purposes.

Therefore, DOE intends to adopt a definition of NEMA Design B motor that includes corrections to the reference to section 12.35.1 of MG1. In addition, for consistency with the footnote to the definition in NEMA MG1–2009, DOE intends to maintain the limitation that the maximum rated slip at rated load to

<sup>6</sup> Section 340(13)(A) of EPCA, as amended, defined the term “electric motor” as “any motor

less than 5 percent for only motors with fewer than 10 poles. DOE agrees with commenters that there is limited benefit to constraining the definition of NEMA Design B to only 60-hertz motors. Though DOE's proposed definitions of general purpose electric motor (subtype I) and (subtype II) limit those regulations to 60-hertz motors, DOE could consider expanding energy conservation standards to 50-hertz motors in the future. Including provisions for 50-hertz motors would maintain consistency with the industry definition and preserve DOE's flexibility to regulate electric motors covered under EPCA. In addition, DOE believes that it is inaccurate and inconsistent with industry practice to narrowly categorize NEMA Design B motors as only a subset of general purpose electric motor (subtype I). It is DOE's understanding that NEMA Design B motors can also fall under the category of general purpose electric motor (subtype II) (e.g., a footless NEMA Design B motor), or other type of electric motor.

For all of these reasons, DOE proposes to adopt a broad definition of a NEMA Design B motor similar to that which was proposed for "NEMA Design B, general purpose electric motor" in the December 2008 NOPR with three revisions. First, DOE proposes to include provisions regarding 50 hertz motors. Second, DOE intends to modify the proposal to update the reference to "NEMA MG1-2006" to "NEMA MG1-2009." Third, DOE proposes to eliminate any reference to NEMA Design B motors necessarily being general purpose electric motors.

#### D. Fire Pump Motors Definition

EPCA section 342(b), as amended by section 313(b)(1)(B) of EISA 2007 (Pub. L. 110-140), prescribes energy efficiency standards for fire pump motors, which were subsequently codified at 10 CFR 431.25(d). 74 FR 12072. However, section 340(13) of EPCA, as amended by EISA 2007, does not define the term "fire pump motor." DOE proposed a definition for fire pump motors in its December 2008 NOPR to mean "a Design B polyphase motor, as defined in NEMA MG1-2006, rated 500 horsepower (373 kW) or less, 600 volts or less, and that is intended for use in accordance with the National Fire Protection Association (NFPA) Standard 20-2007, 'Standard for the Installation of Stationary Pumps for Fire Protection.'" 73 FR 78235. In the NOPR, DOE based the definition primarily on the scope of the Underwriters Laboratories (UL) Standard 1004A-2001, "Fire Pump Motors," and NFPA

Standard 20-2007. Further, DOE proposed to make two modifications to the definition by inserting a publication date for the cited NFPA standard and correcting the title of NFPA Standard 20.

In response to the NOPR, NEMA raised concerns that fire pump motors should not be required to meet any efficiency standards because they are expected to operate on an emergency basis for a relatively short time with virtually no opportunity to save a significant amount of energy. Further, NEMA asserted that motors identified as "fire pump motors" are recognized by the industry as both EPA 1992 electric motors or EISA 2007 general purpose electric motors (subtype I) and, therefore, should not be listed as a separate motor type under the electric motor definition as proposed in the December 2008 NOPR. Notwithstanding this argument, NEMA supports DOE adding the definition of "fire pump motor" to 10 CFR 431.12, provided that it is characterized as being a "general purpose electric motor (subtype I)" with some specific characteristics. (NEMA, No. 12 at pp. 8-9) Additionally, NEMA noted that the UL Standard 1004A-2001, "Fire Pump Motors," has been replaced by UL Standard 1004-5 (2008), and that DOE should reference the newest standard if it is necessary to define a fire pump motor. (NEMA, No. 12 at pp. 8-9)

Similarly, other attendees at the January 29, 2009, public meeting questioned the proposed definition and scope of coverage for fire pump motors. (Baldor, Public Meeting Transcript, No. 8 at pp. 112-113, 116-119, 133-136)

DOE examined UL Standard 1004-5 (2008), including paragraph 1.2, which reads as follows: "Standard covers Design B polyphase motors, as defined in NEMA MG 1, Motors and Generators, rated 500 horsepower (373 kW) or less, 600 volts or less, that are intended for use in accordance with NFPA 20, the Standard for the Installation of Centrifugal Fire Pumps." DOE then compared UL Standard 1004-5 (2008) with the comparable text in UL Standard 1004A-2001, which contains virtually identical language and concludes that the documents share the same scope of coverage. In today's SNOPR, DOE proposes to further clarify that a fire pump motor is an electric motor that is required to meet certain safety and performance requirements set forth by NFPA Standard 20-2010, section 9.5, and UL Standard 1004-5 (2008).

However, similar to DOE's above proposal to adopt a broad definition for a NEMA Design B motor, DOE does not

agree that fire pump motors are necessarily a subset of general purpose electric motors (subtype I) or general purpose electric motors (as defined in this SNOPR). It is DOE's understanding that all fire pump motors, irrespective of whether they are considered general purpose or meet the design constraints of general purpose electric motor (subtype I), would be subject to energy conservation standards. For all of these reasons, in today's SNOPR DOE proposes to define a fire pump motor as an electric motor that is required to meet the performance and construction requirements set forth by NFPA Standard 20-2010, section 9.5, and UL Standard 1004-5 (2008).

#### E. Fire Pump Motor Coverage

Section 313(b)(1)(B) of EISA 2007 amends EPCA section 342(b), to prescribe energy conservation standards for fire pump motors by referring to NEMA MG 1-2006 Table 12-11. That provision reads as follows:

(B) FIRE PUMP MOTORS—Each fire pump motor manufactured (alone or as a component of another piece of equipment) after the 3-year period beginning on the date of enactment of the Energy Independence and Security Act of 2007 shall have nominal full load efficiency that is not less than as defined in NEMA MG-1 (2006) Table 12-11.

(42 U.S.C. 6313(b)(2)(B))

On March 23, 2009, DOE published a technical amendment to 10 CFR part 431 to adopt the energy conservation standards for fire pump motors prescribed by EISA 2007. 74 FR 12058, 12072. The technical amendment codified the energy conservation standards for fire pump motors, contained in Table 12-11 of NEMA Standards Publication MG1-2006 (and Revision 1 to MG1-2006) which contains energy efficiency values from 1 through 500 horsepower and covers 2-pole, 4-pole, 6-pole, and 8-pole, open and enclosed fire pump motors. 74 FR 12061, 12072.

During the January 29, 2009, public meeting there appeared to be some confusion over whether the covered range of horsepower for fire pump motors is 1-200 horsepower or 1-500 horsepower. (GE, Public Meeting Transcript, No. 8 at p. 147; Navigant Consulting, Public Meeting Transcript, No. 8 at pp. 147-148; WEG, Public Meeting Transcript, No. 8 at pp. 148-149; NEMA, No. 12 at pp. 8-9; NEEA, No. 10 at p. 2). Further, Baldor alluded to an excerpt of the language under EPCA section 342(b), as amended by section 313(b)(1)(B) of EISA 2007, which provides "GENERAL PURPOSE

ELECTRIC MOTORS (SUBTYPE I).— Except as provided in subparagraph (B), each general purpose electric motor (subtype I) with a power rating of 1 horsepower or greater, but not greater than 200 horsepower.” (42 U.S.C. 6313(b)(2)(A)) Baldor opined that whether a fire pump motor covered under 42 U.S.C. 6313(b)(2)(B) was limited to the same 1–200 horsepower range as a general purpose electric motor (subtype I) was a matter of statutory interpretation. (Baldor, Public Meeting Transcript, No. 8 at pp. 112–113, 145, 149–50).

DOE understands that EISA 2007 section 313(b)(1)(A) sets energy conservation standards for general purpose electric motors (subtype I) with a rating of 1 through 200 horsepower and clearly exempts fire pump motors from this subsection. (42 U.S.C. 6313(b)(2)(A)) EISA 2007 section 313(b)(1)(B), which prescribes energy conservation standards for fire pump motors, does not, however, explicitly limit the standard based on a motor’s horsepower rating. (42 U.S.C. 6313(b)(2)(B)) Instead, fire pump motor manufacturers are required to meet the requirements of NEMA Standard MG1–2006 Table 12–11, which covers 1 through 500 horsepower motors. (42 U.S.C. 6313(b)(2)(B)) Consequently, DOE continues to believe that energy conservation standards DOE promulgated in its March 23, 2009, technical amendment are the logical result of provisions set forth in EISA section 313(b)(1)(B) and cannot be construed as being a subset of subsection EISA section 313(b)(1)(A) or subject to any constraints contained in subparagraph (A), including horsepower rating constraints. DOE, therefore, proposes in today’s SNOPR that fire pump motor energy conservation standards apply to fire pump motors rated 1 through 500 horsepower.

#### *F. Energy Conservation Standards for Electric Motors*

In addition to the above comments submitted about the definitions for “electric motor,” “general purpose electric motor (subtype I),” “general purpose electric motor (subtype II),” “NEMA Design B motor,” and “fire pump motor,” commenters also submitted comments (shown below) requesting clarification of the tables of electric motor efficiency standards in 10 CFR 431.25.

DOE’s current regulations require manufacturers of “electric motors” to comply with the energy efficiency levels in 10 CFR 431.25(a), which were prescribed by EAct in 1992, but do not specify a sunset date. Section 313(b) of

EISA 2007 amended EPCA to prescribe energy conservation standards for general purpose electric motors (subtype I and subtype II), with a compliance date of December 19, 2010. (42 U.S.C. 6313(b)(2)) These standards, and the compliance date, were subsequently codified at 10 CFR 431.25(c) and (e) respectively. Because EAct does not specify an apparent terminus for the 1992 efficiency levels, NEMA argued that this was potentially confusing for manufacturers to decide which provisions apply—the EAct 1992 levels or the EISA 2007 levels. Consequently, NEMA requested guidance on the proper energy conservation standards for general purpose electric motors (subtype I). (NEMA, No. 12 at p. 9) To address this issue, DOE proposes to delete 10 CFR 431.25(a) to clarify that the standards in this section no longer apply.

In view of the above statutory history and relationship of EPCA to EAct 1992 and to EISA 2007, DOE believes that the electric motor standards prescribed by EAct 1992 apply only to general purpose electric motors (subtype I). DOE proposes that electric motors covered under EAct 1992 (general purpose electric motor (subtype I)), which are manufactured or imported prior to December 19, 2010, were subject to the EAct 1992 energy conservation standards codified at 10 CFR 431.25(a). Further, DOE proposes that a general purpose electric motor (subtype I) that is manufactured or imported on or after December 19, 2010, is subject to the EISA 2007 energy conservation standards that are codified at 10 CFR 431.25(c).

In addition, in the December 2008 NOPR, DOE did not explicitly state that a NEMA Design B general purpose electric motor that otherwise meets the definition of a general purpose electric motor (subtype I) is subject to the EISA 2007 energy conservation standards that are codified at 10 CFR 431.25(c) NEMA expressed concern in responding to the December 2008 NOPR that given the proposed definitions and structure of 10 CFR 431.25, NEMA Design B general purpose electric motors rated 1 horsepower or greater, but not greater than 200 horsepower, would appear to remain at the levels established by EAct 1992 (codified at 10 CFR 431.25(a)).

To clarify the scope of energy conservation standards for NEMA Design B motors from 1 through 200 horsepower, DOE proposes two modifications of 10 CFR 431.25. First, because general purpose electric motors (subtype I) include certain NEMA Design B motors, DOE proposes to

specify that NEMA Design B motors, rated 1 through 200 horsepower, that are also general purpose electric motors (subtype I), are subject to energy conservation standards in 10 CFR 431.25(c). Second, and similarly, as general purpose electric motors (subtype II) include certain NEMA Design B motors (e.g., footless motors), DOE proposes to specify that NEMA Design B motors, rated 1 through 200 horsepower, that are also general purpose electric motors (subtype II), are subject to energy conservation standards in 10 CFR 431.25(e).

EISA 2007 also established energy conservation standards for “NEMA Design B, general purpose electric motors” rated greater than 200 horsepower but less than or equal to 500 horsepower, which were later codified into the current version of 10 CFR 431.25(f). NEMA asserts that the motor industry recognizes a “NEMA Design B, general purpose electric motor” as a specific group of motors that fit the definition of either “electric motor” from EAct 1992 or “general purpose electric motor (subtype I)” from EISA 2007.

DOE notes that EISA 2007 did not define “NEMA Design B, general purpose electric motor,” “NEMA Design B motor,” or “general purpose electric motor.” In the absence of any statutory definition, DOE views the regulatory definition of “general purpose motor” that was in place on EISA 2007’s enactment date as the proper definition for “general purpose electric motor” as used in the term “NEMA Design B, general purpose electric motor.” The “general purpose motor” definition in place at the time of EISA’s enactment is the same as the “general purpose electric motor” definition proposed today, with minor differences for standards updates. DOE proposes that this definition, read in conjunction with the definition of “NEMA Design B” proposed in today’s SNOPR, delineates the motors regulated under 10 CFR 431.25(f). DOE realizes that this interpretation could potentially include NEMA Design B motors that are general purpose electric motors that do not meet the proposed definition of “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).” It is DOE’s understanding, however, that there are few, if any, NEMA Design B motors that would be neither a subtype I or subtype II general purpose electric motor. DOE requests comment on this specific issue. Based on these comments and any additional information collected, DOE may revise this proposed approach.

NEMA also noted that the energy efficiency standards tables contained in 10 CFR 431.25(c)–(f) list motor ratings

in horsepower but not equivalent kilowatts. NEMA requested that DOE include kilowatt power ratings in the newly codified tables that promulgate the EISA 2007 efficiency standards. (NEMA, No. 12 at p. 9) Without this change, NEMA raised concerns that metric-rated motors would not be covered. To ensure that the tables under 10 CFR 431.25(c)–(f) apply to metric-rated, kilowatt-equivalent motors, DOE proposes to amend the tables to provide an equivalent kilowatt rating for each horsepower. Although the EISA 2007 definition for general purpose electric motor (subtype I and subtype II) does not specifically mention motors rated in kilowatts, as motors are rated under (IEC) standards, DOE believes that the statute covers IEC motors that are identical or equivalent to motors included in the statutory definition. DOE understands that IEC motors generally can perform the identical functions of EISA-covered electric motors. Comparable motors of both types provide virtually identical amounts of rotational mechanical power, and generally can operate or provide power for the same pieces of machinery or equipment. A given industrial central air conditioner, for example, could operate with either an IEC or NEMA motor with little or no effect on performance. Providing equivalent kilowatt/horsepower ratings would be consistent with the EPA Act 1992 levels that are codified at 10 CFR 431.25(a), and would clarify the applicability of these standards levels.

Finally, DOE proposes to clarify in 10 CFR 431.11 that the electric motors covered under subpart B are not small electric motors. DOE believes that this clarification is necessary because electric motors (covered under 10 CFR part 431, subpart B) and small electric motors (covered under 10 CFR part 431, subpart X) are separate and unique covered equipment with particular regulatory requirements.

*G. References to International Electrotechnical Commission, National Electrical Manufacturers Association, Institute of Electrical and Electronics Engineers, and Canadian Standards Association Standards for Electric Motors*

After EISA 2007 struck and replaced the definition of electric motor under 42 U.S.C. 6311(13), DOE subsequently proposed in the December 2008 NOPR to remove the corresponding test standards incorporated by reference under 10 CFR 431.15. These test standards helped clarify critical elements in the definition of electric motor under 10 CFR 431.12. 73 FR

78227. The standards incorporated by reference included IEC Standards 60034–1 (1996), 60050–411 (1996), 60072–1 (1991), and 60034–12 (1980).

NEMA commented that when DOE adopted the content of EPA Act 1992 into 10 CFR part 431, it recognized the necessity of including equivalent motors designed in accordance with IEC standards that could be used in the same applications as motors designed in accordance with NEMA MG1 standards. Although the IEC standards do not particularly identify “general purpose motors,” motors built according to IEC specifications can be used interchangeably with NEMA motors in most general purpose applications. Because of this fact, NEMA argued that the applicable IEC standards should be retained in 10 CFR part 431, and that motors constructed in accordance with those standards in metric-equivalent ratings should be considered as covered equipment under 10 CFR part 431. (NEMA, No. 10 at p. 10)

DOE previously took such an approach when addressing IEC metric motors in the final test procedure rule for electric motors at 64 FR 54142 (October 5, 1999). The inclusion of parenthetical references to the IEC standards in the codified definition of “electric motor” under 10 CFR 431.2 (2000) clarified the applicability and coverage of IEC (*i.e.* metric-equivalent) electric motors. For example, under the EPA Act 1992 definition of “electric motor,” a motor had to be “continuous rated.” DOE later clarified “continuous rated” in 10 CFR 431.2 (2000) to mean “is rated for continuous duty (MG1) operation, or is rated duty type S1 (IEC).” Although the then-statutory definition did not explicitly mention IEC motors, DOE proposed that the term “continuous rated” apply to those electric motors that are equivalent to the “continuous duty operation” rating denoted by the parenthetical “MG1” or the equivalent IEC duty type “S1.” (See 61 FR 60440, 60442 (November 27, 1996) where it states that “[A]lthough the statutory definition of ‘electric motor’ does not specifically mention IEC motors, the Department believes that the Act covers IEC motors that are identical or equivalent to motors included in the statutory definition.”) DOE later codified this approach at 10 CFR 431.2. 64 FR 54143 (October 5, 1999).

DOE believes that EISA 2007 provides the same breadth of coverage over IEC motors that are identical or equivalent to electric motors built in accordance with MG1. As discussed earlier in this SNOPR, DOE is proposing a revised definition of “general purpose electric

motor (subtype I)” and “general purpose electric motor (subtype II)” which would incorporate IEC-equivalent motors.

Thus, DOE proposes to maintain IEC standards incorporated by reference in 10 CFR 431.15. In addition, DOE proposes to adopt the updated versions of two of the IEC standards, IEC Standards 60034–1 and 60034–12, to the 2004 and 2007 versions, respectively.

NEMA also notes that a source to obtain IEC standards does not appear in 10 CFR 431.15(d). (NEMA, No. 10 at p. 10) In response to NEMA’s comment, DOE proposes to reorganize and update 10 CFR 431.15 to include each standard incorporated by reference with corresponding updated information about how to obtain copies of these documents.

In addition, DOE notes that several electric motor definitions and sections of 10 CFR part 431 reference outdated standards, such as NEMA MG1–1993, IEEE 112–1996 Test Method B, CAN/CSA C390–93 (Test Method 1). In this SNOPR, DOE proposes to update the following references throughout 10 CFR part 431 to be consistent with current industry standards: NEMA MG1–2009, IEEE 112–2004 Test Method B, and CAN/CSA C390–10. DOE believes that the exceptions to IEEE 112–1996 Test Method B contained in paragraph (2) of appendix B to subpart B, 2. Test Procedures, are contained in the updated version of IEEE 112–2004 Test Method B, although DOE accepts comments on this assessment. DOE does not believe that the updated standards and test procedures will adversely affect the measured losses and determined efficiency of an electric motor, nor significantly change the meaning of a definition. Finally, NEMA recently provided comments on the electric motors framework document indicating that while the test data collection methods for the updated versions of IEEE 112–2004 Test Method B and CAN/CSA 390–10 are the same, there are differences in the methods in which the efficiency is determined from the data.<sup>7</sup> (NEMA, No. 0013 at p. 2) DOE requests comment on this issue.

*H. National Institute of Standards and Technology/National Voluntary Laboratory Accreditation Program Handbook 150–10 Update and Checklist*

In the December 2008 NOPR, DOE proposed updating the current reference to the 1995 edition of the NIST

<sup>7</sup> The written comments cited in this paragraph were submitted to the docket of the energy conservation standards rulemaking for electric motors (refer to <http://www.regulations.gov>, Docket No. EERE–2010–BT–STD–0027; RIN number 1904–AC28).

Handbook 150–10 to the 2007 edition. 73 FR 78228. Although following the NIST/NVLAP Handbook is not a required part of the electric motors test procedure, the Handbook provides important guidance for assuring testing laboratory competency and is used by test facilities seeking accreditation under 10 CFR 431.18, 431.19, and 431.36(a)(2).

At the January 30, 2009, public meeting, Baldor Electric expressed concern that an update to NIST/NVLAP Handbook 150–10 could be problematic because it refers to test methods that are different from the updated test methods proposed by DOE. For example, the NIST/NVLAP Handbook 150–10 refers to proficiency in IEEE 112–1996 Test Method B and CSA C390–93 Test Method 1 to become an accredited laboratory. (Baldor, Public Meeting Transcript, No. 8 at p. 178) Because these industry test methods have been revised, DOE proposed to update 10 CFR 431.16, appendix A to subpart B, and 10 CFR 431.15 to be consistent with current industry practice. 73 FR 78228. Also, DOE proposed that NIST review this matter and consider updating the industry test methods referenced in its NIST/NVLAP Handbook 150–10.

Subsequently, NIST reviewed its Handbook 150–10 and issued a formal Laboratory Bulletin on March 19, 2009 (Lab Bulletin LB–42–2009) about the Efficiency of Electric Motors Program. The Lab Bulletin made a series of updates and corrections. Although NIST did not update its references to CSA C390–93 Test Method 1, DOE and NIST have evaluated the differences between the 1993 version and the updated version of the Canadian standard and have initially determined that there is no substantive difference between the two standards that would result in a significant change in measured efficiency. Therefore, DOE is proposing to adopt NIST/NVLAP Handbook 150–10 that references IEEE 112–2004 (November 2001), CSA C390–10 (March 2010), and NEMA MG1–2009 (April 2009).

A second issue relating to NIST/NVLAP Handbook 150–10 was raised both at the January 30, 2009 public meeting and in subsequent written comments. Baldor commented that while the NIST/NVLAP 150–10 Handbook is available online, Baldor has had difficulty locating the current checklist, formerly in the 1995 version of the handbook, which systematically lists the laboratory testing requirements and the applicable test procedures. Further, the 2007 edition of the handbook does not address the test procedure used for accrediting a

laboratory. (Baldor, Public Meeting Transcript, No. 8 at pp. 166–167) NEMA commented that it found a “significant difference” between the 1995 and 2007 editions of the NIST/NVLAP Handbook 150–10. NEMA noted that the 1995 edition provides (1) information on the required accuracy of the test equipment, (2) details of the test procedure to be used for testing induction motors, and (3) a checklist for the purpose of evaluating the test facility. NEMA expressed concern that the 2007 edition does not contain that technical information. NEMA noted that according to clause 1.6.2 of NIST/NVLAP Handbook 150–10 (2007), all NVLAP programs use a NIST Handbook 150 Checklist, but the document is not easily found on the NIST Web site at <http://www.nist.gov/index.html>. NEMA commented that DOE should not reference the 2007 edition of NIST/NVLAP Handbook 150–10 until the NIST/NVLAP Handbook 150–10 Checklist is available to the public and DOE has examined it to be certain it contains the same information about the accuracy of test equipment and the procedure for testing that is in the 1995 edition. NEMA requests that if DOE finds the checklist to be a proper substitute for the provisions in the 1995 edition, then DOE should update 10 CFR 431.15(e)(2)(i) to refer to the 2007 edition of NIST/NVLAP Handbook 150–10 and add the 2007 Checklist 150–10 to the list of documents incorporated by reference. (NEMA, No. 12 at pp. 11–12)

DOE consulted with NIST on this matter and learned that the NIST/NVLAP Handbook 150–10 (2007) Checklist is available on the NIST Web site at: [http://ts.nist.gov/Standards/Accreditation/upload/NIST\\_HB\\_150\\_10\\_Checklist.pdf](http://ts.nist.gov/Standards/Accreditation/upload/NIST_HB_150_10_Checklist.pdf). Although there are minor differences between the 1995 and 2007 Checklists, DOE is satisfied with the rigor and requirements presented in the 2007 Checklist, which NIST has established as the requirements for accreditation of a laboratory under NIST/NVLAP Handbook 150–10. However, DOE does not agree with NEMA’s recommendation to incorporate by reference the NIST/NVLAP Handbook 150–10 (2007) checklist into 10 CFR 431.15(e). The checklist is not a requirement of the test procedure itself, but rather a document used to accredit a testing facility as being capable of conducting the necessary tests for evaluating the energy efficiency of an electric motor. Finally, while DOE is aware that the 2007 version of the checklist references IEEE 112–1996 and MG1–1993, DOE considers these referenced documents to be updated by

NIST Lab Bulletin LB–42–2009, issued on March 19, 2009. DOE has also asked NIST to further update the referenced standards to include IEEE 112–2004, CSA C390–10, and NEMA MG1–2009.

#### *I. Appendix A to Subpart B of Title 10 of the Code of Federal Regulations Part 431*

Section 313(a)(2) of EISA 2007 amended EPCA section 340(13)(A) to set forth a new definition of “electric motor,” which included motors not previously covered under EPCA, such as a footless motor, close-coupled pump motor, and a vertical solid shaft normal thrust motor. Prior to EISA 2007, the Policy Statement, under appendix A to subpart B of 10 CFR part 431, provided interpretive guidance as to which types of motors DOE viewed as covered under EPCA and how DOE would apply energy conservation standards to electric motors that are components of certain equipment. To accommodate the changes to section 340(13)(A) of EPCA that EISA 2007 introduced, which removed much of the basis for DOE’s previous interpretive guidance, in the December 2008 NOPR, DOE proposed to delete the contents of appendix A to subpart B, and replace the existing policy statement with the term “[Reserved].” DOE also proposed to maintain the outline structure of this subpart should DOE decide in the future to clarify the scope of covered electric motors in its regulations. 73 FR 78228 and 78237.

During the January 29, 2009, public meeting, Baldor commented that removing the guidelines from appendix A to subpart B of 10 CFR part 431 would result in no guidance at present and leave open the possibility to greatly expanded guidance in the future. (Baldor, Public Meeting Transcript No. 8, p. 118)

To address this possibility, DOE is proposing, as an alternative, to revise the contents of appendix A to provide guidance that corresponds with EISA 2007 regarding general purpose electric motors. As guidance, appendix A represents DOE’s interpretation of existing statutes and regulations but does not, and is not intended to, have the force and effect of law.

Specifically, DOE proposes to eliminate references to enactment dates that are no longer applicable and update the scope of coverage to include general purpose electric motors (subtype I) and general purpose electric motors (subtype II). DOE is not proposing to provide guidance in-line with EISA 2007 for fire pump or NEMA Design B motors because DOE does not think such guidance is necessary at this time,

although DOE may add such guidance at a future date.

In addition, the Policy Statement addresses the bounds of standard shaft dimensions applicable to general purpose electric motors (subtype I) and general purpose electric motors (subtype II). It is DOE's understanding that NEMA Standard MG1-2009 and IEC Standard 60072-1 (1991) specify tolerances for the shaft extension diameter and keyset that relate to the fit between the shaft and the device mounted on the shaft. DOE is aware that shafts of special diameter, length, or design are often provided at a customer's request for use in particular applications. However, there are electric motors with non-standard shafts which could be used in most general purpose applications and would then be considered "general purpose electric motors (subtype I)" and "general purpose electric motors (subtype II)." DOE has received inquiries regarding whether motors with shaft designs that are not necessarily in conformance with the standard shaft types and dimensions in NEMA MG1 or IEC 60072-1 are covered under EPCA. (Baldor, No. 16; WEG, No. 17) In response to such inquiries and in view of possible confusion in the marketplace, DOE is proposing to add guidance on shaft diameter, length, shoulder location, and special designs under section III of appendix A to subpart B of 10 CFR part 431.

DOE's guidance specifies the range of variation in motor characteristics beyond which DOE interprets a motor to no longer be general purpose for some specific technical design features. DOE provides this guidance to help avoid market conditions where motor manufacturers and manufacturers of equipment using motors avoid increases in motor efficiency by making technical changes in motor characteristics that do not make substantial changes in motor application or use. DOE considers an empirical test of whether a particular motor design variant can be used in many general purpose applications to be whether many users of general purpose motors might be willing to switch such motor design variants given a relatively modest price differential between a general purpose motor and the motor design variant.

Four general purpose motor design features that may technically be changed while maintaining the general purpose application of a motor include: (1) Shaft diameter, (2) shaft length, (3) shoulder location, and (4) special shaft design features. In the proposed regulatory text, DOE provides the following guidance on the amount of

variation from standard characteristics that maintains the general purpose classification of a motor.

For shaft diameter, DOE provides guidance that any variation in the shaft diameter between the standard shaft diameter of the next lower and higher frame numbers series maintains the general purpose classification of a motor.

For shaft length, DOE provides guidance that any shaft length between and inclusive of 0.5 to 1.25 times the standard shaft length of the motor maintains the general purpose classification of the motor.

For shoulder location, DOE provides guidance that an increase less than or equal to 25% in either the "BA" (MG1) or "C" (IEC) dimensions of the standard motor frame dimensions maintains the general purpose classification of the motor.

For special shaft designs, DOE provides guidance that the special shaft designs of a flat section in shaft (for pulley mounting), and shafts with a threaded hole maintain the general purpose classification of the motor. Alternatively, DOE is proposing guidance that shafts with threads on the outside of the shaft or a stepped shaft do not currently maintain their general purpose classification. If DOE receives information that manufacturers are switching to motors with outside thread and stepped shaft design variants to avoid efficiency improvements, then DOE may change the guidance to classify motors with outside threads and stepped shafts as general purpose electric motors.

#### *J. Definition of Small Electric Motor*

Subsequent to the publication of the July 7, 2009, small electric motor test procedures final rule (74 FR 32059), Baldor expressed concern over the clarity of certain key terms contained within the statutory definition of a small electric motor, asking DOE to clarify the statutory definition of "small electric motor" by interpreting key phrases in the definition, specifically: "General purpose," "induction motor," "two-digit frame number series," and "IEC metric equivalent motors." (Baldor, No. 15 at p. 2) Baldor suggested that DOE consider clarifying the definition by adding parenthetical identifiers "(MG1)" and "(IEC)" to the definition after each of these four key phrases to indicate the industry reference from which DOE interprets the meaning of that phrase. (Baldor, No. 15 at p. 2) These citations would then be expanded upon in the second paragraph of the definition by providing explicit references to the

relevant sections of these industry documents. (Baldor, No. 15 at pp. 2-3)

DOE is currently involved in litigation regarding the final rule on energy conservation standards for small electric motors. 75 FR 10874 (March 9, 2010). Because the definition of "small electric motor" is at issue in the litigation, it is inappropriate for DOE to respond to Baldor's concerns at this time.

#### *K. Canadian Standards Association Test Procedures for Small Electric Motors*

In the December 2008 NOPR, DOE proposed three test methods from which a manufacturer could select to measure the energy efficiency of its covered small electric motors: IEEE Standard 114, IEEE Standard 112, or CAN/CSA Standard C747-94. 73 FR 78223, 78238. The choice of test procedures was consistent with the choice of test methods for electric motors listed in 10 CFR 431.16, where a manufacturer could select either an IEEE or CSA test method for determining the efficiency of covered 1-200 horsepower electric motors. DOE adopted IEEE Standard 114-2001 for single-phase small electric motors and both IEEE Standard 112-2004 Test Method A and Test Method B in its final rule for small electric motors test procedures. 74 FR 32065-32066, 32073-74. Since IEEE Standard 112 Test Method A applies to polyphase small electric motors below 1 kilowatt (1.34 horsepower), DOE determined that Test Method A would apply to polyphase small electric motors rated at or below 1 horsepower, which is the first common horsepower rating below 1 kilowatt (1.34 horsepower). Similarly, IEEE Standard 112 Test Method B would be applicable to polyphase small electric motors rated greater than 1 horsepower. DOE also adopted CAN/CSA-C747-94 as an alternative test method for single-phase motors. In the small electric motors test procedure final rule, DOE stated that it was not adopting any alternative test methods for polyphase small electric motors based on CAN/CSA-747-94 or CAN/CSA-C390-10 Test Method 1 because there may be an inconsistency in the measured efficiency associated with units tested under IEEE Standard 112-2004 Test Method B and CAN/CSA-C747-94. 74 FR 32066.

In today's SNOFR, DOE proposes that a manufacturer may test according to: (1) CAN/CSA C747-09 as an alternative to IEEE Standard 112 Test Method A for polyphase small electric motors rated less than or equal to 1 horsepower (0.746 kilowatt); and (2) CAN/CSA-C390-10, as an alternative to IEEE Standard 112 Test Method B for polyphase small electric motors that

have a rating greater than 1 horsepower (0.746 kilowatt). DOE believes that using the CAN/CSA Standard C747–09 or CAN/CSA Standard C390–10 in this manner will result in consistent measurements of energy efficiency compared to the applicable IEEE Standard 112 and IEEE Standard 114 test methods adopted in the small electric motors final rule and helps promote harmonization of test methods internationally.

#### *L. Small Electric Motor Represented Efficiency Value*

In DOE's notice proposing energy conservation standards for small electric motors, the term "nominal full load efficiency" was defined as the arithmetic mean of the full load efficiency of a population of motors. DOE received numerous comments on this definition, all of which are summarized in its final rule on energy conservation standards for small electric motors. 75 FR 10874 (March 9, 2010). Ultimately, DOE agreed with comments made by NEMA and Baldor and concluded in its final rule that it was not bound to establish energy conservation standards in terms of nominal efficiency. Instead, DOE established energy conservation standards for small electric motors in terms of "average full load efficiency." 75 FR 10914.

At the NOPR public meeting for small electric motor energy conservation standards, held December 17, 2009, Baldor made several comments regarding DOE's proposed definition for "nominal full load efficiency" pertaining to small electric motors. 74 FR 61500 (November 24, 2009). First, Baldor commented that the proposed definition was too similar to the existing definition for "average full load efficiency" and that it differed from the definition in NEMA MG–1, which would confuse users of that voluntary industry guidance. (Baldor, Public Meeting Transcript, No. 20.4 at pp. 112, 126–27). 75 FR 10914 (March 9, 2010). Next, Baldor commented that the proposed definition provided no guidance for what constitutes a population of motors, and suggested that the term be clarified. (Baldor, Public Meeting Transcript, No. 20.4 at pp. 112–13) These two comments were echoed by NEMA in its written comments. (NEMA, No. 24 at pp. 10–16) Finally, Baldor commented that the proposed definition infers that the arithmetic mean of the full-load efficiencies of the population of motors is known and that the nominal full load efficiency must be specified to be equal to the arithmetic mean, which would provide no limit to the number of different values of efficiency that might

be marked on nameplates. In other words, there are many populations or production runs of motors of identical design, wherein each motor could have a slightly different efficiency because of variations in materials, the manufacturing process, and testing equipment. Consequently, there could be no limit to the different arithmetic averages marked on small motor nameplates. As such, Baldor requested further clarification on the determination of any relationship between nominal full load efficiency and calculated efficiency. (Baldor, Public Meeting Transcript, No. 20.4 at pp. 114, 125)<sup>8</sup>

In response to the December 2008 NOPR about test procedures for small electric motors, NEMA also sought clarity on the use of the term "nominal full load efficiency." NEMA noted that DOE had not provided information on the value of efficiency for which test results are to be compared for the purpose of determining compliance. NEMA asked how DOE would require the full load efficiency to be represented on small electric motors, noting that motors are not marked with the average full load efficiency. (NEMA, No. 12 at p. 3).

In developing today's SNO PR, DOE considered the relevant comments submitted to the energy conservation standards and test procedures rulemakings. DOE recognizes that its standards for electric motors and small electric motors use different metrics—*i.e.* nominal full load efficiency (electric motors) and average full load efficiency (small electric motors). The nominal efficiency values for electric motors are based on a logical sequence of standard values in NEMA Standard MG1 Table 12–10 and is familiar to motor users. However, there is no comparable set of standardized values adopted by NEMA for small electric motors and there is no statutory requirement that efficiency standards for these motors be set in terms of their nominal full load efficiency. 74 FR 61431–32 (November 24, 2009).

As mentioned earlier, DOE established energy conservation standards in terms of "average full-load efficiency" in the final rule. 75 FR 10914, 10947 (March 9, 2010). The analyses and results supporting the final energy conservation standards levels for small electric motors were calculated using a metric of average efficiency and DOE in this SNO PR proposes

<sup>8</sup>The written comments cited in this paragraph were submitted to the docket of the small electric motors energy conservation standards rulemaking (Docket No. EERE–2007–BT–STD–0007; RIN number 1904–AB70).

procedures for reporting the average full load efficiency of motors, consistent with the conservation standards for small electric motors. With respect to the term "nominal full load efficiency," since this term is not used in the small electric motors standard, DOE proposes leaving the term undefined. If DOE amends this test procedure to measure the nominal full load efficiency of small electric motors, this change will alter the applicable metric and will require a change in the standard levels for small electric motors to reflect the change in the efficiency metric. (42 U.S.C. 6293(e)). However, DOE understands Baldor's concern to be primarily related to the ambiguity of the definitions proposed in the energy conservation standards NOPR and recognizes that the represented efficiency value has yet to be defined. Therefore, in this SNO PR, DOE proposes procedures for determining the represented efficiency for small electric motors where the represented efficiency is that efficiency that corresponds to a 5 percent increase in losses, compared to the tested efficiency of a random sample of five or more units of a basic model. A very specific technical issue on which DOE invites comment is whether the 5 percent margin between the losses of the represented efficiency and the losses corresponding to the sample average efficiency is large enough to assure that the population of motor basic models is at least as efficient as the represented efficiency.

#### *M. Validation of the Small Electric Motor Alternative Efficiency Determination Method*

Section 343(a)(2) of EPCA requires that test procedures prescribed for electric motors be "reasonably designed to produce test results which reflect energy efficiency," yet not be "unduly burdensome" to conduct. (42 U.S.C. 6314(a)(2)) As discussed in the December 2008 NOPR, DOE recognizes that manufacturers produce large numbers of basic models of small electric motors, numbering in the thousands. These large numbers are due in part to the frequency with which units are modified because of material price fluctuations which, in turn, often necessitate the development of new basic models.

In view of the substantial number of small electric motors that could be subject to an individual testing requirement for each basic model, in the final small electric motors test procedure rule, DOE adopted a certification program that consisted of an alternative efficiency determination method (AEDM). 74 FR 32067, 32073.

An AEDM is a predictive mathematical model developed from engineering analyses of design data and substantiated by actual testing. It represents the energy consumption characteristics of one or more basic models. Before using an AEDM, a manufacturer must determine its accuracy and reliability through actual testing of a statistically valid sample of at least five basic models. (10 CFR 431.445) For each basic model, the manufacturer must test a sample size of at least five units selected at random according to the criteria adopted in section 10 CFR 431.445, "Determination of Small Electric Motor Efficiency." After validating an AEDM's accuracy, the manufacturer may use that AEDM to determine the efficiencies of other basic models of small electric motors without further testing.

In the December 2008 NOPR, DOE proposed guidance about the certification program for testing small electric motors, selecting units from a basic model, and applying the results of the actual testing to substantiate an AEDM. 73 FR 78223–24, 78238–39. Today, DOE proposes additional requirements that are consistent with the AEDM approach adopted for 1–200 horsepower electric motors. These proposals help clarify portions of the AEDM procedure adopted in the final rule for small electric motors. DOE invites comments from interested parties on these requirements for a manufacturer to substantiate the accuracy of its AEDM.

#### *N. Small Electric Motor Nationally Recognized Certification Program*

EPCA provides different requirements for determining the energy efficiency of regulated small electric motors (two-digit NEMA frame) and electric motors (three-digit NEMA frame). In particular, section 345(c) of EPCA directs the Secretary of Energy to require manufacturers of "electric motors" to "certify, through an independent testing or certification program nationally recognized in the United States, that [any electric motor subject to EPCA efficiency standards] meets the applicable standard."<sup>9</sup> (42 U.S.C. 6316(c)) No such requirement for independent testing or certification applies to small electric motors.

<sup>9</sup>Further, 10 CFR 431.17(a)(5) provides for a manufacturer to establish compliance either through (1) a certification program that DOE has classified as nationally recognized, such as CAN/CSA or Underwriters Laboratories, Inc., or (2) testing in any laboratory that is accredited by the National Institute of Standards and Technology/ National Voluntary Laboratory Accreditation Program (NIST/NVLAP).

In the December 2008 NOPR, DOE proposed to allow a manufacturer to self-certify its small electric motors (*i.e.*, not require "independent testing"), which DOE believes is consistent with the compliance certification requirements for other commercial products such as high-intensity discharge lamps and distribution transformers covered under section 346 of EPCA.

In its comments to the NOPR, NEMA observed that many small electric motors sold in the U.S. are also sold in Canada, and that Canadian regulatory entities are considering following DOE's lead in developing energy efficiency standards for small electric motors. (NEMA, No. 12 at p. 4) NEMA noted that because the only means to certify compliance for electric motors in Canada is through the CAN/CSA Energy Efficiency Verification Program, it is likely that the Canadian government will require small electric motors to be certified through the same CAN/CSA Energy Efficiency Verification Program. NEMA requested that DOE recognize independent third party efficiency certification programs for small electric motors, but not mandate use of independent third party certification programs or accreditation programs for testing facilities. Rather, it stressed that DOE recognition of such programs would encourage voluntary use of certification through third parties, such as NIST/NVLAP. In addition, NEMA recommended that DOE allow sufficient time for the approval of such programs and manufacturer participation in such programs because no accreditation programs for testing in accordance with IEEE Standard 112 Method A, IEEE Standard 114, or CAN/CSA–C747 currently exist.

NEEA expressed its support for a nationally recognized certification program or accredited laboratory, according to the requirements that currently apply to electric motors. (See 10 CFR 431.17(a)(5)) It recommended that DOE apply the same requirements to the small electric motors covered in this rulemaking. (NEEA, No. 10 at p. 2)

In view of the above comments, in this SNOFR, DOE is proposing to add the same provisions regarding nationally recognized certification programs to the small electric motors regulations as are currently found in the electric motors regulations at 10 CFR 431.17(a)(5), 431.20, and 431.21. DOE is proposing to allow the use of such approved programs although, in the future, DOE may require manufacturers to test small electric motors through a nationally recognized certification

program or an independent testing program.

#### *O. Issues Related to Compliance Certification and Enforcement of Electric Motors and Small Electric Motors*

In response to the December 2008 test procedure NOPR and the March 2010 small electric motor energy conservation standards NOPR, DOE received comments on several topics pertaining to the compliance certification and enforcement of electric motors and small electric motors. These issues included: Definitions of "basic model" for electric motors and small electric motors, enforcement of energy conservation standards for electric motors and small electric motors, compliance certification and submission of data requirements for electric motors and small electric motors, and labeling requirements for small electric motors. DOE plans to address these issues and others in the second phase of its Compliance Certification and Enforcement rulemaking. In this SNOFR, however, DOE requests further comment and specific suggestions on how DOE should amend the provisions listed above.

### **IV. Public Participation**

#### *A. Submission of Comments*

DOE will accept comments, data, and information regarding this notice or any aspect of this rulemaking no later than February 4, 2011. Comments, data, and information submitted to DOE's e-mail address for this rulemaking should be provided in WordPerfect, Microsoft Word, portable data format (PDF), or text (ASCII) file format. Interested parties should avoid the use of special characters or any form of encryption, and wherever possible, comments should include the electronic signature of the author, if possible. Comments, data, and information submitted to DOE by mail or hand delivery/courier should include one signed original paper copy. No telefacsimiles (faxes) will be accepted.

According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit two copies of the information: One copy of the document including all the information believed to be confidential, and one copy of the document with the information believed to be confidential deleted. Although DOE will consider the submitter's views, DOE will make its own determination as to the confidential status of the information, and treat the

information according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include (1) a description of the items, (2) whether and why such items are customarily treated as confidential within the industry, (3) whether the information is generally known or available from public sources, (4) whether the information has previously been made available to others without obligation concerning its confidentiality, (5) an explanation of the competitive injury to the submitting person which would result from public disclosure, (6) a date after which such information might no longer be considered confidential, and (7) why disclosure of the information would be contrary to the public interest. (10 CFR 1004.11(f))

After the close of the comment period, DOE will review the comments received and conduct further analyses as needed.

#### *B. Issues on Which the Department of Energy Seeks Comment*

Comments are welcome on all the issues raised in this SNOPR. However, DOE is particularly interested in receiving comments concerning the following issues:

##### 1. Definition of Electric Motor

DOE invites comment on its proposed definition for “electric motor.” DOE’s proposed definition is intended to clarify the term “electric motor” in the context of EPCA, and to ensure that all four motor types covered under EISA 2007 are covered under the broad definition of electric motor. *See* section III.A for details.

##### 2. Definition of General Purpose Electric Motors, Subtypes I and II

DOE invites comment on its proposed definitions for “general purpose electric motor (subtype I),” “general purpose electric motor (subtype II),” and “general purpose electric motor.” *See* section III.B for details.

##### 3. Definition of NEMA Design B Motor

DOE invites comment on its revised definition for “NEMA Design B Motor,” which adopts a broad definition of a NEMA Design B motor similar to that which was proposed in the December 2008, NOPR, but maintains the provisions regarding 50 hertz, updates the NEMA MG1 reference, and eliminates any reference to NEMA Design B motors necessarily being general purpose electric motors. *See* section III.C for details.

##### 4. Fire Pump Motors Definition

DOE invites comment on its proposed definition for “fire pump motors.” *See* section III.D for details.

##### 5. Fire Pump Motor Coverage

DOE invites comment on its interpretation of the scope of coverage for fire pump motors. *See* section III.E for details.

##### 6. Energy Conservation Standards for Electric Motors

DOE invites comment on its clarification of the applicability of the energy conservation standards tables contained in 10 CFR 431.25. *See* section III.F for details.

##### 7. References to International Electrotechnical Commission, National Electrical Manufacturers Association, Institute of Electrical and Electronics Engineers, and Canadian Standards Association Standards for Electric Motors

DOE invites comment on its proposal to incorporate updated versions of the IEC, NEMA, IEEE, and CSA standards into 10 CFR part 431 to facilitate and clarify coverage of electric motors, including metric-equivalent motors. DOE also invites comments on whether the updates to the test methods will change the efficiency of motors tested. *See* section III.G for details.

##### 8. National Institute of Standards and Technology/National Voluntary Laboratory Accreditation Program Handbook 150–10 Update and Checklist

DOE invites comment on its proposal to reference NIST Handbook 150–10, which has been updated by NIST to incorporate references to the same test procedures proposed by DOE in the December 2008 NOPR. *See* section III.H for details.

##### 9. Appendix A to Subpart B of Title 10 of the Code of Federal Regulations Part 431

DOE invites comment on its revision of the contents of appendix A to provide guidance in line with the changes promulgated by EISA 2007, including its proposed guidance concerning shaft dimensions, length, shoulder location, and special designs. *See* section III.I for details.

##### 10. Canadian Standards Association Test Procedure for Small Electric Motors

DOE invites comment on its proposal to allow a manufacturer to use CAN/CSA Standard C747–09 as an alternative to the IEEE Standard 112 Test Method A and IEEE Standard 114; and CAN/CSA Standard C390–10 as an alternative

to the IEEE Standard 112 Test Method B for small electric motors. DOE may or may not promulgate these two alternative standards in the final rule of this test procedure based on comments from interested parties. *See* section III.K for details.

##### 11. Small Electric Motor Represented Efficiency Value

DOE invites comment on its proposed definition of the represented efficiency value. *See* section III.L for details.

##### 12. Validation of the Small Electric Motor Alternative Efficiency Determination Method

DOE invites comment on its proposed approach for using actual testing to validate an AEDM model. The proposed method is consistent with the approach followed by electric motor manufacturers for 1–200 horsepower motors currently in place. *See* section III.M for details.

##### 13. Small Electric Motor Nationally Recognized Certification Program

DOE invites comment on its proposed approach to allow manufacturers to certify compliance using a nationally recognized certification program, similar to the program used for electric motors. DOE specifically would like to know if independent third party compliance certification or laboratory accredited programs for small electric motors (1) currently exist for the appropriate small electric motors test procedures, (2) if not should they be established, and (3) should they be made mandatory or voluntary. *See* section III.N for details.

##### 14. Issues Related to Compliance Certification and Enforcement of Electric Motors and Small Electric Motors

DOE invites comment and specific suggestions on how DOE should amend the provisions related to compliance certification and enforcement, including the definition of “basic model,” enforcement of energy conservation standards, and compliance certification and submission of data requirements for electric motors and small electric motors, as well as labeling requirements for small electric motors. *See* section III.O for details.

#### **V. Procedural Issues and Regulatory Review**

##### *A. Review Under Executive Order 12866*

The Office of Management and Budget (OMB) has determined that test procedure rulemakings do not constitute “significant regulatory actions” under Executive Order 12866, “Regulatory

Planning and Review.” 58 FR 51735 (October 4, 1993). Accordingly, this proposed action is not subject to review under that Executive Order by the Office of Information and Regulatory Affairs of OMB.

#### *B. Review Under the Regulatory Flexibility Act*

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act of 1996) requires preparation of an initial regulatory flexibility analysis for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will have no significant economic impact on a substantial number of small entities. Also, as required by Executive Order 13272, “Proper Consideration of Small Entities in Agency Rulemaking,” 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel’s Web site at <http://www.gc.doe.gov>. DOE reviewed today’s SNOPR under the provisions of the Regulatory Flexibility Act and the policies and procedures published on February 19, 2003.

To estimate the number of small businesses impacted by the rule, DOE considered the size standards for a small business listed by the North American Industry Classification System (NAICS) code and description, under 13 CFR 121.201. To be considered a small business, a manufacturer of electric motors or small electric motors and its affiliates may employ a maximum of 1,000 employees. DOE estimates that there are approximately 20 domestic motor manufacturers that manufacture electric motors or small electric motors covered by EPCA, and no more than six of these manufacturers are small businesses employing a maximum of 1,000 employees. These estimates are based on analyses DOE conducted in the final rule establishing energy conservation standards for small electric motors at 75 FR 10874 (March 9, 2010) and the final rule that set forth test procedures for electric motors at 64 FR 54114 (October 5, 1999). In these previous rules, DOE calculated the number of motor manufacturers, including which of those manufacturers are small businesses, based on interviews with motor manufacturers and publicly available data.

The SNOPR proposes additional test procedures that are consistent with current industry practice, clarifies definitions for certain key terms, clarifies the scope of energy conservation standards for electric motors, and updates references to standards publications and test procedures otherwise incorporated by reference. DOE believes that the cost of complying with the test procedures proposed in this SNOPR would not impose significant economic costs on motor manufacturers that are small businesses because many, if not most, motor manufacturers are already manufacturing their electric motors or small electric motors to the latest industry-developed energy efficiency performance standards that are the basis for the standards in EPCA and in Title 10 of the Code of Federal Regulations, Part 431 (10 CFR part 431). In addition, the SNOPR promotes consistency with current industry test procedures and methodologies because the SNOPR is not proposing any additional testing requirements or higher accuracy tolerances beyond what is already contained in the industry standards documents incorporated by reference for this equipment (*i.e.*, IEEE Std 114, IEEE Std 112; CSA C390, and CAN/CSA C747.) DOE elaborated on these analyses in the December 22, 2008, test procedure notice of proposed rulemaking (NOPR), which today’s SNOPR supplements. 73 FR 78220. DOE believes that the costs imposed on manufacturers of electric motors and small electric motors as a result of today’s SNOPR are not greater than the costs that would have been imposed on these manufacturers under the December 22, 2008 NOPR.

Moreover, DOE previously considered the one comment it received regarding impacts on small businesses in the small motors test procedure rulemaking at 64 FR 54114 (October 5, 1999). The commenter recommended that DOE provide more than one agency to certify and/or accredit labs and provide a simple procedure to verify electric motor compliance with EPCA efficiency levels. DOE addressed these concerns by finalizing a rule that provided multiple ways to certify compliance and adopted simple, repeatable, and statistically valid sampling procedures.

Based on the above, DOE believes that the test procedure amendments proposed in today’s SNOPR will not have a significant impact on a substantial number of small entities and that a Regulatory Flexibility Act analysis is therefore not required. Accordingly, DOE has not prepared a regulatory flexibility analysis for this

rulemaking. DOE provided the Chief Counsel for Advocacy of the Small Business Administration a certification and supporting statement of factual basis pursuant to 5 U.S.C. 605(b).

#### *C. Review Under the Paperwork Reduction Act*

Manufacturers of covered electric motors must certify to DOE that their electric motors comply with any applicable energy conservation standard. In certifying compliance, manufacturers must test their electric motors according to the DOE test procedure for electric motors, including any amendments adopted for that test procedure. DOE has proposed regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including electric motors. 75 FR 56796 (September 16, 2010). The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (PRA). This requirement has been submitted to OMB for approval. Public reporting burden for the certification is estimated to average 20 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Public comment is sought regarding: whether this proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; the accuracy of the burden estimate; ways to enhance the quality, utility, and clarity of the information to be collected; and ways to minimize the burden of the collection of information, including through the use of automated collection techniques or other forms of information technology. Send comments on these or any other aspects of the collection of information to Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE-2J, 1000 Independence Avenue, SW., Washington, DC 20585-0121 and e-mail to [Christine.J.Kymn@omb.eop.gov](mailto:Christine.J.Kymn@omb.eop.gov).

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

#### *D. Review Under the National Environmental Policy Act*

In this notice, DOE proposes limited revisions to new and amended test procedures that are used to measure and determine the energy efficiency of certain types of electric motors. This proposed rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969, (NEPA) 42 U.S.C. 4321 *et seq.*, and DOE's implementing regulations at 10 CFR part 1021. In particular, today's proposed rule is covered by Categorical Exclusion A5, for rulemakings that interpret or amend an existing rule without changing the environmental effect, as set forth in DOE's NEPA regulations in appendix A to subpart D of 10 CFR part 1021. Today's proposed rule will not affect the amount, quality, or distribution of energy usage, and therefore will not result in any environmental impacts. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

#### *E. Review Under Executive Order 13132*

Executive Order 13132, "Federalism," 64 FR 43255 (August 10, 1999), imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The executive order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountability process to ensure meaningful and timely input by State and local officials in developing regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in developing such regulations. 65 FR 13735. DOE examined this proposed rule and determined that it does not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Accordingly, no action is required under Executive Order 13132.

#### *F. Review Under Executive Order 12988*

With respect to the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice

Reform," 61 FR 4729 (February 7, 1996), imposes on Federal agencies the duty to adhere to the following requirements: (1) Eliminate drafting errors and ambiguity, (2) write regulations to minimize litigation, and (3) provide a clear legal standard for affected conduct rather than a general standard and promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires, among other things, that Executive agencies make every reasonable effort to ensure that the regulation (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, this rulemaking meets the relevant standards of Executive Order 12988.

#### *G. Review Under the Unfunded Mandates Reform Act of 1995*

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) (Pub. L. 104-4, 2 U.S.C. 1501 *et seq.*) generally requires Federal agencies to examine closely the impacts of regulatory actions on State, local, or Tribal governments. Subsection 101(5) of title I of that law defines a Federal intergovernmental mandate to include a regulation that would impose upon State, local, or Tribal governments an enforceable duty, except a condition of Federal assistance or a duty arising from participating in a voluntary Federal program. Title II of that law requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments, in the aggregate, or the private sector, other than to the extent such actions merely incorporate requirements specifically set forth in a statute. Section 202 of the title requires a Federal agency to perform a detailed assessment of the anticipated costs and benefits of any rule that includes a Federal mandate that may result in costs State, local, or Tribal governments or the private sector of \$100 million or more in any one year (adjusted annually for inflation). (2 U.S.C. 1532(a) and (b)) Section 204 of that title requires each

agency that proposed a rule containing a significant Federal intergovernmental mandate to develop an effective process for obtaining meaningful and timely input by elected officers of State, local, and Tribal governments. (2 U.S.C. 1534) On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820 (also available at <http://www.gc.doe.gov>). Today's supplemental proposed rule does not establish any new or amended test procedures that would be used in measuring the energy efficiency of electric motors or small electric motors—it merely clarifies existing definitions and test procedures. This supplemental proposed rule would, therefore, not result in the expenditure of \$100 million or more in any year. Accordingly, no assessment or analysis is required under the UMRA.

#### *H. Review Under the Treasury and General Government Appropriations Act, 1999*

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. Today's supplemental proposed rule to amend DOE test procedures would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is unnecessary to prepare a Family Policymaking Assessment.

#### *I. Review Under Executive Order 12630*

Pursuant to Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights," 53 FR 8859 (March 18, 1988), DOE has determined that this supplemental proposed rule would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

#### *J. Review Under the Treasury and General Government Appropriations Act, 2001*

Section 515 of the Treasury and General Government Appropriations Act, 2001 (Pub. L. 106-554, 44 U.S.C. 3516) provides for agencies to review most disseminations of information to the public under information quality guidelines established by each agency under general guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (February 22, 2002), and DOE's guidelines were published at 67 FR 62446 (October 7, 2002). DOE has reviewed today's supplemental proposed rule under the OMB and DOE

guidelines and has concluded that it is consistent with applicable policies in those guidelines.

#### K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB a Statement of Energy Effects for any proposed significant energy action. A "significant energy action" is defined as any action by an agency that promulgated a final rule or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use. Because this rulemaking is not expected to be a significant regulatory action under Executive Order 12866; it would not have a significant adverse effect on the supply, distribution, or use of energy; and has not been designated a significant energy action by the Administrator of OIRA, DOE has determined that this rule is not a significant energy action. Accordingly, DOE has not prepared a Statement of Energy Effects for this rulemaking.

#### L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95-91), DOE must comply with section 32 of the Federal Energy Administration Act of 1974 (Pub. L. 93-275), as amended by the Federal Energy Administration Authorization Act of 1977 (Pub. L. 95-70). (15 U.S.C. 788) Section 32 provides that where a proposed rule authorizes or requires use of commercial standards, the NOPR must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Department of Justice (DOJ) and the Federal Trade Commission (FTC) concerning the impact of the commercial or industry standards on competition.

The rule proposed in this notice incorporates testing methods contained

in the following commercial standards: (1) CAN/CSA C390-10, *Test methods, marking requirements, and energy efficiency levels for three-phase induction motors*, March 22, 2010; (2) CAN/CSA C747-09, *Energy efficiency test methods for small motors*, October 1, 2009; (3) IEC Standard 60034-1 (2010), *Rotating Electrical Machines, Part 1: Rating and Performance*, Section 4: Duty, clause 4.2.1 and Figure 1; (4) Standard 60034-12 (2007), *Rotating Electrical Machines, Part 12: Starting Performance of Single-Speed Three-Phase Cage Induction Motors*, clauses 5.2, 5.4, 6, and 8, and Tables 1, 2, 3, 4, 5, 6, and 7; and (5) NEMA Standards Publication MG1-2009 Section I (Part 1), Section I (Part 4), Section II (Part 12), and Section II (Part 14).

DOE has evaluated these revised standards and is unable to conclude whether they fully comply with the requirements of section 32(b) of the Federal Energy Administration Act (*i.e.*, that they were developed in a manner that fully provides for public participation, comment, and review). DOE will consult with the Attorney General and the Chairman of the FTC about the impact of these test procedures on competition.

#### VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this proposed rule.

#### List of Subjects in 10 CFR Part 431

Administrative practice and procedure, Energy conservation, Incorporation by reference, Reporting and recordkeeping requirements.

Issued in Washington, DC, on December 15, 2010.

Cathy Zoi,

*Assistant Secretary, Energy Efficiency and Renewable Energy.*

For the reasons stated in the preamble, DOE proposes to amend part 431 of chapter II of title 10, Code of Federal Regulations, as set forth below.

#### PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

1. The authority citation for part 431 continues to read as follows:

**Authority:** 42 U.S.C. 6291-6317.

2. Section 431.11 is revised to read as follows:

##### § 431.11 Purpose and scope.

This subpart contains energy conservation requirements for electric motors. It contains test procedures that

EPCA requires DOE to prescribe, related requirements, energy conservation standards prescribed by EPCA, labeling rules, and compliance procedures. It also identifies materials incorporated by reference in this part. This subpart does not cover "small electric motors," which are addressed in subpart X of this part.

3. Section 431.12 is amended by revising the introductory text, revising the definitions of "accreditation," "definite purpose motor," "general purpose electric motor (subtype I)," "general purpose electric motor (subtype II)," and "nominal full load efficiency," by removing the definition of "general purpose motor" and by adding in alphabetical order, new definitions for "electric motor," "fire pump motor," "general purpose electric motor," and "NEMA Design B motor" to read as follows:

##### § 431.12 Definitions.

The following definitions apply for purposes of this subpart, and of subparts U and V of this part. Any words or terms not defined in this section or elsewhere in this part shall be defined as provided in Section 340 of the Act.

*Accreditation* means recognition by an accreditation body that a laboratory is competent to test the efficiency of electric motors according to the scope and procedures given in Test Method B of IEEE Standard 112-2004 and CAN/CSA Standard C390-10 (incorporated by reference, *see* § 431.15).

\* \* \* \* \*

*Definite purpose motor* means any motor designed in standard ratings with standard operating characteristics or standard mechanical construction for use under service conditions other than usual, such as those specified in NEMA Standards Publication MG1-2009, paragraph 14.3, "Unusual Service Conditions," (incorporated by reference, *see* § 431.15) or for use on a particular type of application, and which cannot be used in most general purpose applications.

\* \* \* \* \*

*Electric motor* means a machine that converts electrical power into rotational mechanical power.

\* \* \* \* \*

*Fire pump motor* means an electric motor that meets the performance and construction requirements of section 9.5 of National Fire Protection Association (NFPA) Standard 20-2010, "Standard for the Installation of Stationary Pumps for Fire Protection," and Underwriters Laboratories (UL) 1004-5, "Standard for Fire Pump Motors," dated September 15, 2008.

\* \* \* \* \*

*General purpose electric motor* means any electric motor that is designed in standard ratings with either:

(1) Standard operating characteristics and mechanical construction for use under usual service conditions, such as those specified in NEMA Standards Publication MG1–2009, paragraph 14.2, “Usual Service Conditions,”

(incorporated by reference, *see* § 431.15) and without restriction to a particular application or type of application; or

(2) Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA Standards Publication MG1–2009, paragraph 14.3, “Unusual Service Conditions,” (incorporated by reference, *see* § 431.15) or for a particular type of application, and which can be used in most general purpose applications. These cited examples of standard operating characteristics and mechanical construction are for illustrative purposes only.

*General purpose electric motor (subtype I)* means a general purpose electric motor that:

(1) Is a single-speed induction motor (MG1);

(2) Is rated for continuous duty (MG1) operation or for duty type S1 (IEC);

(3) Contains a squirrel-cage (MG1) or cage (IEC) rotor;

(4) Has foot-mounting that may include foot-mounting with flanges or detachable feet;

(5) Is built in accordance with NEMA T-frame dimensions (MG1) or their IEC metric equivalents (IEC);

(6) Has performance in accordance with NEMA Design A (MG1) or B characteristics or equivalent designs such as IEC Design N (IEC);

(7) Operates on polyphase alternating current 60-hertz sinusoidal power, and:

(i) Is rated 230 or 460 volts (or both) including motors rated at multiple voltages that include 230 or 460 volts (or both), or

(ii) Can be operated on 230 or 460 volts (or both); and

(8) Includes, but is not limited to, explosion-proof construction.

**Note to Definition of General purpose electric motor (subtype I):** Terms in this definition followed by the parenthetical “MG1” must be construed with reference to provisions in NEMA Standards Publication MG1–2009 (incorporated by reference in § 431.15), and elements followed by the parenthetical “IEC” must be construed with reference to the IEC Standards (incorporated by reference in § 431.15). 10 CFR part 431, subpart B applies to general purpose electric motors (subtype I) even if the NEMA or IEC-equivalent frame size or design element has been discontinued or is discontinued in the future.

*General purpose electric motor (subtype II)* means any general purpose electric motor that incorporates design elements of a general purpose electric motor (subtype I) but, unlike a general purpose electric motor (subtype I), is configured in one or more of the following ways:

(1) Is built in accordance with NEMA U-frame dimensions (MG1) or their IEC metric equivalents (IEC);

(2) Has performance in accordance with NEMA Design C characteristics (MG1) or equivalent designs such as IEC Design H (IEC);

(3) Is a close-coupled pump motor;

(4) Is a footless motor;

(5) Is a vertical solid shaft normal thrust motor (as tested in a horizontal configuration) (MG1);

(6) Is an eight-pole motor (900 rpm); or

(7) Is a polyphase motor with voltage of not more than 600 volts (other than 230 or 460 volts).

**Note to Definition of General purpose electric motor (subtype II):** Terms in this definition followed by the parenthetical “MG1” must be construed with reference to provisions in NEMA Standards Publication MG1–2009 (incorporated by reference in § 431.15), and elements followed by the parenthetical “IEC” must be construed with reference to the IEC Standards (incorporated by reference in § 431.15). 10 CFR part 431, subpart B applies to general purpose electric motors (subtype I) even if the NEMA or IEC-equivalent frame size or design element has been discontinued or is discontinued in the future.

\* \* \* \* \*

*NEMA Design B motor* means a squirrel-cage motor designed to withstand full-voltage starting, developing locked-rotor, breakdown, and pull-up torques adequate for general application as specified in sections 12.38, 12.39 and 12.40 of NEMA Standards Publication MG1–2009 (incorporated by reference, *see* § 431.15), drawing locked-rotor current not to exceed the values shown in section 12.35.1 for 60 hertz and 12.35.2 for 50 hertz of NEMA Standards Publication MG1–2009, and having a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

\* \* \* \* \*

*Nominal full load efficiency* means, with respect to an electric motor, a representative value of efficiency selected from the “nominal efficiency” column of Table 12–10, NEMA Standards Publication MG1–2009, (incorporated by reference, *see* § 431.15), that is not greater than the average full load efficiency of a

population of motors of the same design.

\* \* \* \* \*

4. A new § 431.14 is added to read as follows:

**§ 431.14 Sources for information and guidance.**

(a) *General.* The standards listed in this paragraph are referred to in the DOE procedures for testing laboratories, and recognition of accreditation bodies and certification programs but are not incorporated by reference. These sources are given here for information and guidance.

(b) *NVLAP.* National Voluntary Laboratory Accreditation Program, National Institute of Standards and Technology, 100 Bureau Drive, M/S 2140, Gaithersburg, MD 20899.

(1) NVLAP Handbook 150, *Procedures and General Requirements*, March 1994.

(2) NVLAP Handbook 150–10, *Efficiency of Electric Motors*, August 1995.

(c) *ISO/IEC.* International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH–1211 Geneva 20, Switzerland/ International Electrotechnical Commission, 3, rue de Varembe, P.O. Box 131, CH–1211 Geneva 20, Switzerland.

(1) ISO/IEC Guide 25, *General requirements for the competence of calibration and testing laboratories*, 1990.

(2) ISO Guide 27, *Guidelines for corrective action to be taken by a certification body in the event of either misapplication of its mark of conformity to a product, or products which bear the mark of the certification body being found to subject persons or property to risk*, 1983.

(3) ISO/IEC Guide 28, *General rules for a model third-party certification system for products*, 2004.

(4) ISO/IEC Guide 58, *Calibration and testing laboratory accreditation systems—General requirements for operation and recognition*, 1993.

(5) ISO/IEC Guide 65, *General requirements for bodies operating product certification systems*, 1996.

5. Section 431.15 is revised to read as follows:

**§ 431.15 Materials incorporated by reference.**

(a) *General.* The Department of Energy incorporates by reference the following standards and test procedures into subpart B of part 431. The Director of the Federal Register has approved the material listed for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any

subsequent amendment to a standard by the standard-setting organization will not affect DOE regulations unless and until DOE amends its test procedures. Material is incorporated as it exists on the date of the approval, and a notice of any change in the material will be published in the **Federal Register**. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html). Also, this material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Sixth Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, (202) 586-2945, or go to [http://www1.eere.energy.gov/buildings/appliance\\_standards/](http://www1.eere.energy.gov/buildings/appliance_standards/).

(b) **CAN/GSA**. Canadian Standards Association, Sales Department, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, L4W 5N6, Canada, 1-800-463-6727, or go to <http://www.shopcsa.ca/onlinestore/welcome.asp>.

(1) **CSA C390-10**, *Test methods, marking requirements, and energy efficiency levels for three-phase induction motors*, March 22, 2010, IBR approved for §§ 431.12; 431.16; 431.19; 431.20; appendix B to subpart B of part 431.

(2) [Reserved]

(c) **IEC**. International Electrotechnical Commission Central Office, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, +41 22 919 02 11, or go to <http://webstore.iec.ch>.

(1) International Electrotechnical Commission Standard 60034-1 (2010), *Rotating Electrical Machines, Part 1: Rating and Performance*, Section 4: Duty, clause 4.2.1 and Figure 1, IBR approved for § 431.12.

(2) International Electrotechnical Commission Standard 60050-411 (1996), *International Electrotechnical Vocabulary Chapter 411: Rotating machines*, sections 411-33-07 and 411-37-26, IBR approved for § 431.12.

(3) International Electrotechnical Commission Standard 60072-1 (1991), *Dimensions and Output Series for Rotating Electrical Machines—Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080*, clauses 2, 3, 4.1, 6.1, 7, and 10, and Tables 1, 2, and 4, IBR approved for § 431.12.

(4) International Electrotechnical Commission Standard 60034-12 (2007), *Rotating Electrical Machines, Part 12: Starting Performance of Single-Speed Three-Phase Cage Induction Motors*, clauses 5.2, 5.4, 6, and 8, and Tables 1,

2, 3, 4, 5, 6, and 7, IBR approved for § 431.12.

(d) **IEEE**. Institute of Electrical and Electronics Engineers Standard 112 can be obtained from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, 1-800-678-IEEE (4333), or <http://www.ieee.org/web/publications/home/index.html>.

(1) Institute of Electrical and Electronics Engineers, Inc., Standard 112-2004, *Test Procedure for Polyphase Induction Motors and Generators, Test Method B, Input-Output with Loss Segregation*, 4 November 2004, IBR approved for §§ 431.12; 431.16; 431.19; 431.20; appendix B to subpart B of part 431.

(2) [Reserved]

(e) **NEMA**. National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1752, Rosslyn, Virginia 22209, 703-841-3200, or go to <http://www.nema.org/>.

(1) The following provisions of NEMA Standards Publication MG1-2009, *Motors and Generators*, IBR approved for §§ 431.12; 431.31; appendix A to subpart B; and appendix B to subpart B of part 431:

(i) Section I, General Standards Applying to All Machines, Part 1, Referenced Standards and Definitions, paragraphs 1.18.1, 1.18.1.1, 1.19.1.1, 1.19.1.2, 1.19.1.3, and 1.40.1, IBR approved for § 431.12;

(ii) Section I, General Standards Applying to All Machines, Part 4, Dimensions, Tolerances, and Mounting, paragraphs 4.1, 4.2.1, 4.2.2, 4.4.1, 4.4.2, 4.4.4, 4.4.5, and 4.4.6, Figures 4-1, 4-2, 4-3, 4-4, and 4-5, and Table 4-2, IBR approved for § 431.12;

(iii) Section II, Small (Fractional) and Medium (Integral) Machines, Part 12, Tests and Performance—AC and DC Motors, paragraphs 12.35.1, 12.38.1, 12.38.2, 12.39.1, 12.39.2, and 12.40.1, 12.40.2, 12.58.1, and Tables 12-2 and 12-10, IBR approved for § 431.12, and paragraph 12.58.2, IBR approved for § 431.31; and

(iv) Section II, Small (Fractional) and Medium (Integral) Machines, Part 14, Application Data—AC and DC Small and Medium Machines, paragraphs 14.2 and 14.3, IBR approved for § 431.12.

(2) [Reserved]

6. Section 431.18, paragraph (b) is revised to read as follows:

**§ 431.18 Testing laboratories.**

\* \* \* \* \*

(b) NIST/NVLAP is under the auspices of the National Institute of Standards and Technology (NIST)/ National Voluntary Laboratory Accreditation Program (NVLAP), which

is part of the U.S. Department of Commerce. NIST/NVLAP accreditation is granted on the basis of conformance with criteria published in 15 CFR part 285. The National Voluntary Laboratory Accreditation Program, "Procedures and General Requirements," NIST Handbook 150-10, February 2007, and Lab Bulletin LB-42-2009, *Efficiency of Electric Motors Program*, (see § 431.15(f)(2)(i)), present the technical requirements of NVLAP for the Efficiency of Electric Motors field of accreditation. This handbook supplements NIST Handbook 150, National Voluntary Laboratory Accreditation Program "Procedures and General Requirements," which contains 15 CFR part 285 plus all general NIST/NVLAP procedures, criteria, and policies. Changes in NIST/NVLAP's criteria, procedures, policies, standards, or other bases for granting accreditation occurring after the initial effective date of 10 CFR part 431 shall not apply to accreditation under this part unless approved in writing by the Department of Energy. Information regarding NIST/NVLAP and its Efficiency of Electric Motors Program (EEM) can be obtained from NIST/NVLAP, 100 Bureau Drive, Mail Stop 2140, Gaithersburg, MD 20899-2140, (301) 975-4016 (telephone), or (301) 926-2884 (fax).

7. Section 431.19, paragraphs (b)(4) and (c)(4), are revised to read as follows:

**§ 431.19 Department of Energy recognition of accreditation bodies.**

\* \* \* \* \*

(b) \* \* \*

(4) It must be expert in the content and application of the test procedures and methodologies in IEEE Standard 112-2004 Test Method B and CSA Standard C390-10 (incorporated by reference, see § 431.15) or similar procedures and methodologies for determining the energy efficiency of electric motors.

(c) \* \* \*

(4) *Expertise in electric motor test procedures*. The petition should set forth the organization's experience with the test procedures and methodologies in IEEE Standard 112-2004 Test Method B and CSA Standard C390-10 (incorporated by reference, see § 431.15) and with similar procedures and methodologies. This part of the petition should include description of prior projects, qualifications of staff members, and the like. Of particular relevance would be documentary evidence that establishes experience in applying the guidelines contained in the ISO/IEC Guide 25, General Requirements for the Competence of Calibration and Testing Laboratories, (see § 431.15(f)(2)(ii)) to

energy efficiency testing for electric motors.

\* \* \* \* \*

8. Section 431.20 is amended by revising paragraphs (b)(4) and (c)(4) to read as follows:

**§ 431.20 Department of Energy recognition of nationally recognized certification programs.**

\* \* \* \* \*

(b) \* \* \*

(4) It must be expert in the content and application of the test procedures and methodologies in IEEE Standard 112–2004 Test Method B and CAN/CSA Standard C390–10 (incorporated by reference, *see* § 431.15) or similar procedures and methodologies for determining the energy efficiency of electric motors. It must have satisfactory

criteria and procedures for the selection and sampling of electric motors tested for energy efficiency.

(c) \* \* \*

(4) Expertise in electric motor test procedures. The petition should set forth the program’s experience with the test procedures and methodologies in IEEE Standard 112–2004 Test Method B and CSA Standard C390–10 (incorporated by reference, *see* § 431.15) and with similar procedures and methodologies for electric. This part of the petition should include a description of prior projects, qualifications of staff members, and the like. Of particular relevance would be documentary evidence that establishes experience in applying guidelines contained in the ISO/IEC Guide 25, *General requirements for the*

*competence of calibration and testing laboratories*, to energy efficiency testing for electric motors.

\* \* \* \* \*

9. Section 431.25 is revised to read as follows:

**§ 431.25 Energy conservation standards.**

(a) Except as provided in paragraph (b) of this section, each general purpose electric motor (subtype I) with a power rating of 1 horsepower or greater, but not greater than 200 horsepower, including a NEMA Design B motor that is a general purpose electric motor (subtype I), manufactured (alone or as a component of another piece of equipment) shall have a nominal full load efficiency no less than the following:

**NOMINAL FULL-LOAD EFFICIENCIES OF GENERAL PURPOSE ELECTRIC MOTORS**

[Subtype I]

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency					
	Open motors (number of poles)			Enclosed motors (number of poles)		
	6	4	2	6	4	2
1/75	82.5	85.5	77.0	82.5	85.5	77.0
1.5/1.1	86.5	86.5	84.0	87.5	86.5	84.0
2/1.5	87.5	86.5	85.5	88.5	86.5	85.5
3/2.2	88.5	89.5	85.5	89.5	89.5	86.5
5/3.7	89.5	89.5	86.5	89.5	89.5	88.5
7.5/5.5	90.2	91.0	88.5	91.0	91.7	89.5
10/7.5	91.7	91.7	89.5	91.0	91.7	90.2
15/11	91.7	93.0	90.2	91.7	92.4	91.0
20/15	92.4	93.0	91.0	91.7	93.0	91.0
25/18.5	93.0	93.6	91.7	93.0	93.6	91.7
30/22	93.6	94.1	91.7	93.0	93.6	91.7
40/30	94.1	94.1	92.4	94.1	94.1	92.4
50/37	94.1	94.5	93.0	94.1	94.5	93.0
60/45	94.5	95.0	93.6	94.5	95.0	93.6
75/55	94.5	95.0	93.6	94.5	95.4	93.6
100/75	95.0	95.4	93.6	95.0	95.4	94.1
125/90	95.0	95.4	94.1	95.0	95.4	95.0
150/110	95.4	95.8	94.1	95.8	95.8	95.0
200/150	95.4	95.8	95.0	95.8	96.2	95.4

(b) Each fire pump motor manufactured (alone or as a component of another piece of equipment) shall

have a nominal full load efficiency no less than the following:

**NOMINAL FULL-LOAD EFFICIENCIES OF FIRE PUMP MOTORS**

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
1/75	74.0	80.0	82.5	–	74.0	80.0	82.5	75.5
1.5/1.1	75.5	84.0	84.0	82.5	77.0	85.5	84.0	82.5
2/1.5	85.5	85.5	84.0	84.0	82.5	86.5	84.0	84.0
3/2.2	86.5	86.5	86.5	84.0	84.0	87.5	87.5	85.5
5/3.7	87.5	87.5	87.5	85.5	85.5	87.5	87.5	87.5
7.5/5.5	88.5	88.5	88.5	87.5	85.5	89.5	89.5	88.5
10/7.5	89.5	90.2	89.5	88.5	88.5	89.5	89.5	89.5

NOMINAL FULL-LOAD EFFICIENCIES OF FIRE PUMP MOTORS—Continued

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
15/11	89.5	90.2	91.0	89.5	88.5	90.2	91.0	90.2
20/15	90.2	91.0	91.0	90.2	89.5	90.2	91.0	90.2
25/18.5	90.2	91.7	91.7	91.0	89.5	91.7	92.4	91.0
30/22	91.0	92.4	92.4	91.0	91.0	91.7	92.4	91.0
40/30	91.0	93.0	93.0	91.7	91.0	93.0	93.0	91.7
50/37	91.7	93.0	93.0	92.4	91.7	93.0	93.0	92.4
60/45	92.4	93.6	93.6	93.0	91.7	93.6	93.6	93.0
75/55	93.6	93.6	94.1	93.0	93.0	93.6	94.1	93.0
100/75	93.6	94.1	94.1	93.0	93.0	94.1	94.5	93.6
125/90	93.6	94.1	94.5	93.6	93.6	94.1	94.5	94.5
150/110	93.6	94.5	95.0	93.6	93.6	95.0	95.0	94.5
200/150	93.6	94.5	95.0	94.5	94.1	95.0	95.0	95.0
250/186	94.5	95.4	95.4	94.5	94.5	95.0	95.0	95.4
300/224		95.4	95.4	95.0		95.0	95.4	95.4
350/261		95.4	95.4	95.0		95.0	95.4	95.4
400/298			95.4	95.4			95.4	95.4
450/336			95.8	95.8			95.4	95.4
500/373			95.8	95.8			95.8	95.4

(c) Each general purpose electric motor (subtype II) with a power rating of 1 horsepower or greater, but not greater than 200 horsepower, including

a NEMA Design B motor that is a general purpose electric motor (subtype II), manufactured (alone or as a component of another piece of

equipment) shall have a nominal full load efficiency no less than the following:

NOMINAL FULL-LOAD EFFICIENCIES OF GENERAL PURPOSE ELECTRIC MOTORS

[Subtype II]

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
1/75	74.0	80.0	82.5		74.0	80.0	82.5	75.5
1.5/1.1	75.5	84.0	84.0	82.5	77.0	85.5	84.0	82.5
2/1.5	85.5	85.5	84.0	84.0	82.5	86.5	84.0	84.0
3/2.2	86.5	86.5	86.5	84.0	84.0	87.5	87.5	85.5
5/3.7	87.5	87.5	87.5	85.5	85.5	87.5	87.5	87.5
7.5/5.5	88.5	88.5	88.5	87.5	85.5	89.5	89.5	88.5
10/7.5	89.5	90.2	89.5	88.5	88.5	89.5	89.5	89.5
15/11	89.5	90.2	91.0	89.5	88.5	90.2	91.0	90.2
20/15	90.2	91.0	91.0	90.2	89.5	90.2	91.0	90.2
25/18.5	90.2	91.7	91.7	91.0	89.5	91.7	92.4	91.0
30/22	91.0	92.4	92.4	91.0	91.0	91.7	92.4	91.0
40/30	91.0	93.0	93.0	91.7	91.0	93.0	93.0	91.7
50/37	91.7	93.0	93.0	92.4	91.7	93.0	93.0	92.4
60/45	92.4	93.6	93.6	93.0	91.7	93.6	93.6	93.0
75/55	93.6	93.6	94.1	93.0	93.0	93.6	94.1	93.0
100/75	93.6	94.1	94.1	93.0	93.0	94.1	94.5	93.6
125/90	93.6	94.1	94.5	93.6	93.6	94.1	94.5	94.5
150/110	93.6	94.5	95.0	93.6	93.6	95.0	95.0	94.5
200/150	93.6	94.5	95.0	94.5	94.1	95.0	95.0	95.0

(d) Each NEMA Design B motor that is a general purpose electric motor with a power rating of more than 200

horsepower, but not greater than 500 horsepower, manufactured (alone or as a component of another piece of

equipment) shall have a nominal full load efficiency no less than the following:

NOMINAL FULL-LOAD EFFICIENCIES OF NEMA DESIGN B GENERAL PURPOSE ELECTRIC MOTORS

Motor horsepower/ standard kilowatt equivalent	Nominal full-load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
250/186 .....	94.5	95.4	95.4	94.5	94.5	95.0	95.0	95.4
300/224 .....		95.4	95.4	95.0		95.0	95.4	95.4
350/261 .....		95.4	95.4	95.0		95.0	95.4	95.4
400/298 .....			95.4	95.4			95.4	95.4
450/336 .....			95.8	95.8			95.4	95.4
500/373 .....			95.8	95.8			95.8	95.4

(e) 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 any table of energy conservation standards in paragraphs (a) through (d) of this section, 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; or

(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 paragraphs (e)(1) or (e)(2) of this section, whichever applies.

(f) This section does not apply to definite purpose motors, special purpose motors, or those motors exempted by the Secretary.

10. In § 431.31, paragraph (a)(2) is revised to read as follows:

**§ 431.31 Labeling requirements.**

(a) \* \* \*

(2) *Display of required information.*

All orientation, spacing, type sizes, type faces, and line widths to display this required information shall be the same as or similar to the display of the other performance data on the motor's permanent nameplate. The nominal full load efficiency shall be identified either by the term "Nominal Efficiency" or "Nom. Eff." or by the terms specified in paragraph 12.58.2 of NEMA MG1-2009, (incorporated by reference, see § 431.15) as for example "NEMA Nom. Eff. \_\_\_." The DOE number shall be in the form "CC\_\_\_."

\* \* \* \* \*

11. Appendix A to subpart B of part 431 is revised to read as follows:

**Appendix A to Subpart B of Part 431— Policy Statement for Electric Motors Covered Under the Energy Policy and Conservation Act**

This is in part an update to a reprint of a policy statement that was originally published on November 5, 1997 at 62 FR 59978 and is herein modified according to the Energy Policy and Conservation Act, as amended by the Energy Independence and Security Act of 2007.

**Policy Statement for Electric Motors Covered Under the Energy Policy and Conservation Act**

**I. Introduction**

The Energy Policy and Conservation Act (EPCA), 42 U.S.C. 6311, *et seq.*, as amended by the Energy Policy Act of 1992 (EPA 1992), established energy efficiency standards and test procedures for certain commercial and industrial electric motors manufactured (alone or as a component of another piece of equipment).<sup>1</sup> EPCA also directs the Department of Energy (DOE or Department) to implement the statutory test procedures prescribed for motors, and to require efficiency labeling of motors and certification that covered motors comply with the standards. (42 U.S.C. 6314-6315)

On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA 2007) struck EPCA section 340(13)(A) and all that followed through the end of subpart (A), including the definition of "electric motor," and inserted in its place two new subsections under the heading "electric motor" that defined two subtypes of general purpose electric motors: General purpose electric motor (subtype I) and general purpose electric motor (subtype II). (42 U.S.C. 6311(13)(A) and (B)) Section 313(b)(1) of EISA 2007 updated the energy conservation standards for those electric motors already covered by EPCA (general purpose electric motor (subtype I)) and established energy conservation standards for specific motor types not previously covered, including: General purpose electric motor

<sup>1</sup> The term "manufacture" means "to manufacture, produce, assemble or import." EPCA § 321(10). Thus, the standards apply to motors produced, assembled, imported or manufactured after these statutory deadlines.

(subtype II), fire pump motors, and NEMA Design B, general purpose electric motors rated at 200 to 500 horsepower. (42 U.S.C. 6313(b)(2)) The EISA 2007 energy conservation standards apply to covered motors manufactured or imported on or after December 19, 2010. The EISA 2007 definitions and efficiency standards were subsequently codified under §§ 431.12 and 431.25 respectively, of Title 10 of the Code of Federal Regulations, Part 431 (10 CFR part 431).

On October 5, 1999, the Department published a Final Rule on Test Procedures for Electric Motors that clarified the several definitions including "electric motor," "general purpose electric motor," "general purpose electric motor (subtype I)," and "general purpose electric motor (subtype II)."

Notwithstanding the above referenced provisions, in the past there has been uncertainty as to which motors EPCA covers. Consequently, motor manufacturers requested that the Department provide additional guidance as to which types of motors are "general purpose electric motors (subtype I)," "general purpose electric motors (subtype II)," "definite purpose motors," and "special purpose motors" under EPCA. The policy statement that follows represents the Department's interpretation of existing statutes and regulations, informed by input from motor manufacturers and energy efficiency advocates. It is not intended to create or remove any rights or duties, nor is it intended to affect any other aspect of EPCA, EISA or DOE regulations. It does not, and is not intended to, have the force and effect of law.

**II. Guidelines for Determining Whether a Motor Is Covered as a General Purpose Electric Motor (Subtype I) or (Subtype II)**

**A. General**

EPCA, as amended by EISA 2007, specifies minimum nominal full-load energy efficiency standards for several types of electric motors, including general purpose electric motors (subtype I) and general purpose electric motors (subtype II). Motors with features or characteristics that do not meet the definitions of the above terms are not required to meet the corresponding EPCA requirements. An example includes variable speed motors operated on a variable frequency power supply. Similarly, multi-speed motors and variable-speed motors, such as inverter-duty motors, are not covered equipment, based on their intrinsic design for

use at variable speeds. However, NEMA Design A, B, or C motors that are single speed, meet all other criteria under the definitions in EPCA for general purpose electric motors (subtype I) or general purpose electric motors (subtype II), and can be used with an inverter in variable speed applications as an additional feature, are covered equipment under EPCA. In other words, being suitable for use on an inverter by itself does not exempt a motor from general purpose electric motors (subtype I) and general purpose electric motors (subtype II) EPCA requirements.

#### B. Electrical Features

EPCA, as amended by EISA, establishes two categories of electric motors: General purpose electric motor (subtype I) or a general purpose electric motor (subtype II). In DOE's view, a general purpose electric motor (subtype I) or (subtype II) operates on polyphase alternating current 60-Hertz sinusoidal power, and can be operated on either 230 volts or 460 volts, or both; or can be operated with voltage of not more than 600 volts (other than 230 or 460 volts). Furthermore, "can be operated" implicitly means that the motor can be operated successfully. According to National Electrical Manufacturers Association (NEMA) Standards Publication MG1-2009, paragraph 12.44, "Variations from Rated Voltage and Rated Frequency," alternating-current motors must operate successfully under running conditions at rated load with a variation in the voltage or the frequency up to the following: plus or minus 10 percent of rated voltage, with rated frequency for induction motors;<sup>2</sup> plus or minus 5 percent of rated frequency, with rated voltage; and a combined variation in voltage and frequency of 10 percent (sum of absolute values) of the rated values, provided the frequency variation does not exceed plus or minus 5 percent of rated frequency. DOE believes that, for purposes of determining whether a motor is a general purpose electric motor (subtype I) or (subtype II), these criteria should be used to determine when a motor that is not rated at 230 or 460 volts or 60 Hertz can be operated at such voltage and frequency; or when it is operated at a rated voltage of not more than 600 volts (other than 230 or 460 volts).<sup>3</sup>

Under sections 340(13)(A) and 342(b)(3) of EPCA, as amended by EISA 2007, general

<sup>2</sup> For example, a motor that is rated at 220 volts should operate successfully on 230 volts, since  $220 + .10(220) = 242$  volts. A 208 volt motor, however, would not be expected to operate successfully on 230 volts, since  $208 + .10(208) = 228.8$  volts.

<sup>3</sup> The Department understands that a motor that can operate at such voltage and frequency, based on variations defined for successful operation, will not necessarily perform in accordance with the industry standards established for operation at the motor's rated voltage and frequency. In addition, motors are to be tested at their rated values under the test procedures prescribed by EPCA. Therefore, in DOE's view, a motor that is not rated for 230 or 460 volts, or 60 Hertz, but that can be successfully operated at these levels, must meet the energy conservation standards at its rated voltage(s) and frequency. When a motor is rated to include a wider voltage range that includes 230/460 volts, the motor should meet the energy conservation standards at 230 volts or 460 volts.

purpose electric motors (subtype I) include motors that meet the electrical performance characteristics of NEMA Design A or B; and general purpose electric motors (subtype II) include motors that meet the electrical performance characteristics NEMA Design A, B, or C. NEMA Standards Publication MG1 assigns design letters, such as Design A, B, C, D, or E, to identify various combinations of electrical performance characteristics, including: locked rotor torque, breakdown torque, pull-up torque, locked rotor current, and slip at rated load. In the Department's view, a motor must meet the electrical performance characteristics of a NEMA Design A, B, or C motor to be covered as a general purpose electric motor (subtype I) or general purpose electric motor (subtype II). For example, as to locked rotor torque, MG1 specifies performance values for Design A, B, or C motors of a given speed and horsepower. A motor that does not meet the locked rotor torque requirements for Design A, B, or C is not a general purpose electric motor (subtype I) or general purpose electric motor (subtype II) covered under EPCA.

#### C. Size

Motors designed for use on a particular type of application which are in a frame size that is one or more frame series larger than the frame size assigned to that rating in NEMA Standards Publication MG1-2009 Part 13, "Frame Assignments for Alternating Current Integral Horsepower Induction Motors," are not, in the Department's view, usable in most general purpose applications. This is due to the physical size increase associated with a frame series change. A frame series is defined by the first two digits of the frame size designation, and is a measure of the distance between the centerline of the shaft and the bottom of the mounting feet. For example, 324T and 326T are both in the same frame series, while 364T is in the next larger frame series. Hence, in the Department's view, a motor that is of a larger frame series than normally assigned to that standard rating of motor would not be usable in most general purpose applications, and therefore is not covered by EPCA's definitions of general purpose electric motors (Subtype I) and general purpose electric motors (Subtype II). A physically larger motor within the same frame series would be covered, however, because it would be usable in most general purpose applications.

Motors built in a T-frame series or a T-frame size smaller than that assigned by MG1-2009, or motors built in a U-frame series or a U-frame size smaller than that assigned by MG1-2009, are also considered usable in most general purpose applications. This is because simple modifications can generally be made to fit a smaller motor in place of a motor with a larger frame size assigned in conformity with NEMA MG1. Therefore, DOE believes that such smaller motors are covered by EPCA.

#### D. Motors With Seals

Some electric motors have seals to prevent ingress of water, dust, oil, and other foreign materials into the motor. DOE understands that, typically, a manufacturer will add seals to a motor that it manufactures, so that it will

sell two motors that are identical except that one has seals and the other does not. In such a situation, if the motor without seals is covered by EPCA's energy conservation standards, then the motor with seals will also be covered because it can still be used in most general purpose applications. DOE understands, however, that manufacturers previously believed motors with seals were not covered under EPCA, in part because IEEE Standard 112, "Test Procedure for Polyphase Induction Motors and Generators," prescribed by EPCA, does not address how to test a motor with seals installed.

The efficiency rating of such a motor, if determined with seals installed and when the motor is new, apparently would significantly understate the efficiency of the motor as operated. New seals are stiff, and provide friction that is absent after their initial break-in period. DOE understands that, after this initial period, the efficiency ratings determined for the same motor with and without seals would be virtually identical. To construe EPCA, therefore, as requiring such separate efficiency determinations would impose an unnecessary burden on manufacturers.

In light of the foregoing, the Department believes that EPCA generally permits the efficiency of a motor with seals to be determined without the seals installed. Furthermore, notwithstanding the prior belief that such motors are not covered by EPCA, use of this approach to determining efficiency will enable manufacturers to meet EPCA's standards with respect to covered motors with seals.

### III. Discussion of How DOE Would Apply EPCA Definitions, Using the Foregoing Guidelines

Using the foregoing guidelines, the attached matrix provides DOE's view as to which motors with common features are covered by EPCA's definitions of "general purpose electric motor (subtype I)" and "general purpose electric motor (subtype II)." Because manufacturers produce many basic models that have many modifications of generic general purpose motors, the Department does not represent that the matrix is all-inclusive. Rather it is a set of examples demonstrating how DOE would apply EPCA definitions, as construed by the above guidelines, to various motor types. The matrix classifies motors into five categories, which are discussed in the following passages.

#### Category I—General Purpose Electric Motors (Subtype I) and (Subtype II)

Category I consists of general purpose electric motors (subtype I) and general purpose electric motors (subtype II).

The Department understands that some motors essentially are relatively simple modifications of generic general purpose electric motors (subtype I) or (subtype II). Modifications could consist, for example, of minor changes such as the addition of temperature sensors or a heater, the addition of a shaft extension and a brake disk from a kit, or changes in exterior features such as the motor housing. Such motors can still be used for most general purpose applications, and

the modifications have little or no effect on motor performance. Nor do the modifications affect energy efficiency.

*Category II—Specific Purpose Electric Motors That Can Be Used in Most General Purpose Applications*

Category II motors are essentially modifications of generic general purpose motors for use on a particular type of application. These specific purpose Category II motors have been considered “definite-purpose” motors in common industry parlance, but are covered as general purpose electric motors (subtype I or II) under EPCA because they can be used in most general purpose applications. Category II motors are often electric motors with horsepower ratings that fall between the horsepower ratings in Section 342(b) of EPCA, thermally protected motors, and motors with roller bearings.

*Categories III, IV and V—Definite Purpose Motors, Special Purpose Motors, and Motors Outside the Scope of “General Purpose Electric Motor (Subtype I)” and “General Purpose Electric Motor (Subtype II)”*

Category III consists of “definite purpose motors” as defined in EPCA and 10 CFR 431.12. Section 6311(13)(C) of EPCA, as amended by EISA 2007, defines the term “definite purpose motor” as “any motor designed in standard ratings with standard operating characteristics or standard mechanical construction for use under service conditions other than usual or for use on a particular type of application and which cannot be used in most general purpose applications.” EPCA does not prescribe standards and test procedures for “definite purpose motors.”

Category IV consists of “special purpose motors” as defined in EPCA and 10 CFR 431.12. Section 6311(13)(D) of EPCA, as amended by EISA 2007, defines the term “special purpose motor” as “any motor, other than a general purpose motor or definite purpose motor, which has special operating characteristics or special mechanical construction, or both, designed for a particular application.” EPCA does not prescribe standards and test procedures for “special purpose motors.”

Category V consists of electric motors outside the scope of “general purpose electric motor (subtype I)” and “general purpose electric motor (subtype II)” as defined in EPCA and 10 CFR 431.12.

*Totally Enclosed Nonventilated (TENV) and Totally Enclosed Air-Over (TEAO) Motors*

A motor designated in NEMA MG1–2009, paragraph MG1–1.26.1, as “totally enclosed non-ventilated (IC410)”<sup>4</sup> is “a frame-surface

cooled totally enclosed machine which is only equipped for cooling by free convection.” This means that the motor, when properly applied, does not require the use of any additional means of cooling installed external to the motor enclosure. The TENV motor is cooled by natural conduction and natural convection of the motor heat into the surrounding environment. The general requirement for the installation of the TENV motor is that it not be placed in a restricted space that would inhibit this natural dissipation of the motor heat. Most general purpose applications use motors which include a means for forcing air flow through or around the motor and usually through the enclosed space and, therefore, can be used in spaces that are more restrictive than those required for TENV motors. Placing a TENV motor in such common restricted areas is likely to cause the motor to overheat. The TENV motor may also be larger than the motors used in most general purpose applications, and would take up more of the available space, thus reducing the size of the open area surrounding the motor. Installation of a TENV motor might require, therefore, an additional means of ventilation to continually exchange the ambient around the motor.

A motor designated in NEMA MG1–2009, paragraph 1.26.9, as “totally-enclosed air-over (IP54, IC417)” is a totally enclosed frame-surface cooled machine intended for exterior cooling by a ventilating means external to the machine.” That is, a TEAO motor has a cooling mechanism that is separate and independent from the motor, such as a fan. The motor must be provided with the additional ventilation to prevent it from overheating.

Consequently, neither the TENV motor nor the TEAO motor would be suitable for most general purpose applications, and, the Department considers these motors as “definite purpose motors.”

*Integral Gearmotors*

An “integral gearmotor” is an assembly of a motor and a specific gear drive or assembly of gears, such as a gear reducer, as a unified package. The motor portion of an integral gearmotor is not necessarily a complete motor, since the end bracket or mounting flange of the motor portion is also part of the gear assembly and cannot be operated when separated from the complete gear assembly. Typically, an integral gearmotor is not manufactured to standard T-frame dimensions specified in NEMA MG1, or standard U-frame dimensions. Moreover, neither the motor portion nor the entire integral gearmotor, are capable of being used in most general purpose applications without significant modifications. An integral gearmotor is also designed for a specific purpose and can have unique performance characteristics, physical dimensions, and casing, flange and shafting configurations. Consequently, DOE considers integral gearmotors to be outside the scope of “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).”

However, an electric motor which is connected to a stand-alone mechanical gear drive or an assembly of gears, such as a gear

reducer connected by direct coupling, belts, bolts, a kit, or other means, is covered equipment under the definitions of “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).”

*Shafts*

1. Shaft diameter—The shaft diameter is designated in NEMA MG1 by the identifier “U” and in IEC 60072–1 by the identifier “H.” The strength of a shaft is dependent on the diameter of the shaft. If the diameter of a shaft is smaller than the standard diameter, the shaft may not be of sufficient strength required for general purpose belted and overhung loads. If the diameter of a shaft is bigger than the standard diameter, it may not be possible to install a coupling or pulley with an inside diameter of sufficient size to accommodate the oversized shaft and provide sufficient remaining material of sufficient strength required for general purpose applications.

The Department believes that couplings and pulleys appropriate for a given horsepower rating in the standard (NEMA or IEC) frame number series should be available to fit shaft diameters which are as large as the standard diameter for the next higher frame number series or as small as the standard diameter for the next lower frame number series. A motor otherwise considered to be a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II),” but with a shaft diameter within the range bounded by the standard diameters for the next lower and next higher frame number series, is considered to be a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).” For the purpose of providing the requested guidance, the Department does not consider a motor with a shaft diameter smaller than that of the next lower frame number series or larger than that of the next higher frame number series to be a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).”

2. Shaft length—The useable shaft length is designated in NEMA MG1 by the identifier “N–W” and in IEC 60072–1 by the identifier “E.” A shaft length different from the standard dimensions would require a change in the overall space required for the motor and a change in the position in which the motor could be mounted compared to a motor having a shaft of standard length. A motor with a shaft of shorter length should fit within the space of a motor having a shaft of standard length, although the mounting base may have to be modified to accommodate the change in the position of the mounting holes in the base of the motor. However, it is possible that the shaft may be too short to accommodate the size of a coupling or pulley required for the load in many general purpose applications. The Department believes that appropriate couplings or pulleys are available for shafts with a length not shorter than 50 percent of the standard length. A motor with a shaft of longer length would not fit within the space of a motor having a shaft of standard length and the location of some of the mounting holes in the base of the motor may be beyond the mounting base for the motor. The end of

<sup>4</sup> IP refers to the IEC Standard 34–5: Classification of degrees of protection provided by enclosures for rotating machines. IC refers to the IEC Standard 34–6: Methods of cooling rotating machinery. The IP and IC codes are referenced in the NEMA designations for TENV and TEAO motors in MG1–2009 Part 1, “Classification According to Environmental Protection and Methods of Cooling,” as a Suggested Standard for Future Design, since the TENV and TEAO motors conform to IEC Standards. Details of protection (IP) and methods of cooling (IC) are defined in MG1 Part 5 and Part 6, respectively.

the motor with a longer shaft length may also extend beyond the equipment where it could possibly present some concerns should persons or other equipment unintentionally come in contact with the motor. Objects in closer proximity of the non-drive end of the motor with the longer shaft length may interfere with the cooling of the motor. The Department believes that there is some additional space available in most general purpose applications to accommodate a shaft somewhat longer than standard length, but that accommodating for increased length may be more difficult than accommodating for shorter length. The Department believes that an increase of 25 percent in standard shaft is acceptable in most general purpose applications. For the purpose of providing the requested guidance, a motor with shaft length between 0.5 to 1.25 times the standard length for the appropriate NEMA MG1 or IEC standard does not preclude the motor from being considered “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).” A motor with a shaft length outside of that range is not considered to be a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).”

3. Shoulder location—The distance from the centerline of the mounting hole in the nearest foot to the shoulder on the drive end shaft is designated in NEMA MG1 by the identifier “BA” and in IEC 60072-1 by the identifier “C.” The location of the shoulder limits the position at which the coupling, pulley, or load can be installed. The “BA” or “C” dimension is separate from that of the useable shaft length “N-W” or “E.” The two values combined define the distance from the centerline of the mounting hole in the nearest foot to the end of the shaft. A change in the “BA” or “C” dimension can then result in introducing installation problems similar to those resulting from a change in the “N-W” or “E” dimension. A decrease in the “BA” or “C” dimension may require modifying the mounting base to accommodate the shorter

distance between the mounting holes and the end of the shaft, but there should be no problem installing the appropriate coupling or pulley for most general purpose applications. As in the case of the “N-W” or “E” dimension, a significant increase in the “BA” or “C” dimension could make it difficult to install the motor in most general purpose applications or could introduce concerns of safety. For the purpose of providing the requested guidance, an increase in the “BA” or “C” dimension up to 0.25 times the standard useable shaft length dimension “N-W” or “E” does not preclude the motor from being considered a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).” The Department does not consider a motor with an increase in the “BA” or “C” dimension greater than 0.25 times that of the “N-W” or “E” dimension to be a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).”

4. Special design—The standard dimensions in NEMA MG-1 are for smooth shafts with or without keyways. Such shafts are used with pulleys and couplings commonly found in most general purpose applications. The shaft may be straight or tapered. Other shaft designs are provided for particular applications. The Department has examined the issue of special shafts with respect to whether or not both a pulley and a coupling could be separately installed on the special shaft. An example of one common modification of the shaft design is to include a flat section in place of the keyway for the purpose of securing a coupling, pulley, or driven equipment on the shaft. It is the Department’s belief that such a modification would not make it difficult to use the motor in most general purpose applications and would not remove the motor from being considered a “general purpose electric motor.” Some special purpose or definite purpose applications require that the shaft have a threaded section, for securing the connection to the driven equipment in place.

A threaded section on the outside of the shaft surface inhibits the proper installation of a pulley or coupling. DOE considers motors with such threaded shafts to be “definite purpose” or “special purpose” motors. However, a threaded hole in the shaft should not interfere with the installation of a pulley or coupling and DOE does not consider this to be a design which exempts the motor from being classified as a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).” As another example, motors with stepped shafts, consisting of lengths of differing diameter over the useable length of the shaft, make it difficult to properly install a pulley or coupling for general purpose applications. DOE considers motors with a stepped shaft are considered to be “definite purpose” or “special purpose” motors. The Department recognizes that the aforementioned designs are just a few examples of special shaft designs and that it is not possible to cover all possible variations of shaft design in this guidance. Rather, the Department offers the guidance that if both a properly sized pulley and properly sized coupling can be installed on a non-standard shaft at minimal cost, then the motor is not precluded from being considered to be a “general purpose electric motor (subtype I)” or “general purpose electric motor (subtype II).”

**IV. Further Information**

The Department has incorporated this Policy Statement into appendix A to subpart B of Title 10 of the Code of Federal Regulations, Part 431, to provide guidance as to the Department’s interpretation of EPCA, as amended. Any comments or suggestions with respect to this Policy Statement, as well as requests for further information, should be addressed to the Program Manager, Building Technologies, EE-2J, U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0121.

**EXAMPLES OF MANY COMMON FEATURES OR MOTOR MODIFICATIONS TO ILLUSTRATE HOW THE EPCA DEFINITIONS AND DOE GUIDELINES WOULD BE APPLIED TO EPCA MOTOR CATEGORIES: GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE I) AND GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE II); DEFINITE PURPOSE; AND SPECIAL PURPOSE**

Motor modification	Category <sup>1</sup>					Explanation
	I	II	III	IV	V	
<b>A. Electrical Modifications:</b>						
1. Altitude .....	X	.....	.....	.....	.....	General purpose up to a frame series change larger. General purpose up to a frame series change larger. General Purpose Electric Motors (Subtype I) and (Subtype II) apply to single speed only.
2. Ambient .....	X	.....	.....	.....	.....	
3. Multispeed .....	.....	.....	.....	.....	X	
4. Special Leads .....	X	.....	.....	.....	.....	Due to special construction. General purpose up to a frame series change larger.
5. Special Insulation .....	X	.....	.....	.....	.....	
6. Encapsulation .....	.....	.....	.....	X	.....	
7. High Service Factor .....	X	.....	.....	.....	.....	
8. Space Heaters .....	X	.....	.....	.....	.....	General purpose up to a frame series change larger. Requires retesting and third party agency approval.
9. Wye Delta Start .....	X	.....	.....	.....	.....	
10. Part Winding Start .....	X	.....	.....	.....	.....	
11. Temperature Rise .....	X	.....	.....	.....	.....	
12. Thermally Protected .....	.....	X	.....	.....	.....	
13. Thermostat/Thermistor .....	X	.....	.....	.....	.....	
14. Special Voltages .....	X	.....	.....	.....	.....	
15. Intermediate Horsepowers .....	.....	X	.....	.....	.....	EPCA applies to motors operating on voltages less than 600 volts at 60 Hertz. Round horsepower according to 10 CFR 431.42 for efficiency.

EXAMPLES OF MANY COMMON FEATURES OR MOTOR MODIFICATIONS TO ILLUSTRATE HOW THE EPCA DEFINITIONS AND DOE GUIDELINES WOULD BE APPLIED TO EPCA MOTOR CATEGORIES: GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE I) AND GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE II); DEFINITE PURPOSE; AND SPECIAL PURPOSE—Continued

Motor modification	Category <sup>1</sup>					Explanation
	I	II	III	IV	V	
16. Frequency .....	.....	.....	.....	.....	X	EPCA applies to motors operating on voltages less than 600 volts at 60 Hertz.
17. Fungus/Trop Insulation .....	X					
B. Mechanical Modifications:						
18. Special Balance .....	X					
19. Bearing Temp. Detector .....	X					
20. Special Base/Feet .....	.....	.....	.....	.....	X	Does not meet definition of T-frame or U-frame.
21. Special Conduit Box .....	X					
22. Auxiliary Conduit Box .....	X					
23. Special Paint/Coating .....	X					
24. Drains .....	X					
25. Drip Cover .....	X					
26. Ground. Lug/Hole .....	X					
27. Screens on ODP Enclosure .....	X					
28. Mounting F1, F2; W1-4; C1, 2 .....	X					Foot-mounting, rigid base, and resilient base.
C. Bearings:						
29. Bearing Caps .....	X					
30. Roller Bearings .....	.....	X	.....	.....	.....	Test with a standard bearing.
31. Shielded Bearings .....	X					
32. Sealed Bearings .....	X					Test with a standard bearing.
33. Thrust Bearings .....	.....	.....	.....	X	.....	Special mechanical construction.
34. Clamped Bearings .....	X					
35. Sleeve Bearings .....	.....	.....	.....	X	.....	Special mechanical construction.
D. Special Endshields:						
36. C Face .....	X					As defined in NEMA MG1.
37. D Flange .....	X					As defined in NEMA MG1.
38. Customer Defined .....	.....	.....	.....	X	.....	Special design for a particular application.
E. Seals:						
39. Contact Seals .....	X					Includes lip seals and taconite seals—test with seals removed.
40. Non-Contact Seal .....	X					Includes labyrinth and slinger seals—test with seals installed.
F. Shafts:						
41. Standard Shafts/NEMA MG1 .....	X					Includes single and double, cylindrical, tapered, and short shafts.
42. Non-Standard Shafts or Special Shafts.	X					Shaft diameter bound by the standard diameters for the next lower and next higher frame number series.
	.....	.....	.....	.....	X	Shaft diameter smaller than that of the next lower frame number series or larger than that of the next higher frame number.
	X					Shaft length from 0.5 to 1.25 times the standard length for the appropriate NEMA MG1 or IEC standard.
	.....	.....	.....	.....	X	Shaft length outside the range from 0.5 to 1.25 times the standard length for the appropriate NEMA MG1 or IEC standard.
	X					Shaft shoulder location with an increase in the “BA” or “C” dimension up to 0.25 times that standard useable shaft length dimension “N-W” or “E”.
	.....	.....	.....	.....	X	A motor with an increase in the “BA” or “C” dimension greater than 0.25 times that of the “N-W” or “E” dimension.
	X					If both a properly sized pulley and properly sized coupling can be separately installed on a non-standard shaft without significantly changing the shaft extension or mounting configuration of the driven equipment.
43. Non-Standard Material .....	X					
G. Fans:						
44. Special Material .....	X					
45. Quiet Design .....	X					
H. Other Motors:						
46. Washdown .....	X					Test with seals removed.
47. Close-coupled pump .....	X					JM and JP frame assignments.
48. Integral Gear Motor .....	.....	.....	.....	.....	X	Typically special mechanical design, and not a T-frame or U-frame; motor and gearbox inseparable and operate as one system.
49. Vertical solid shaft normal thrust .....	X					
50. Saw Arbor .....	.....	.....	.....	X	.....	Special electrical/mechanical design.

EXAMPLES OF MANY COMMON FEATURES OR MOTOR MODIFICATIONS TO ILLUSTRATE HOW THE EPCA DEFINITIONS AND DOE GUIDELINES WOULD BE APPLIED TO EPCA MOTOR CATEGORIES: GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE I) AND GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE II); DEFINITE PURPOSE; AND SPECIAL PURPOSE—Continued

Motor modification	Category <sup>1</sup>					Explanation
	I	II	III	IV	V	
51. TENV .....	.....	.....	X	.....	.....	Totally-enclosed non-ventilated; not equipped for cooling (IP54, IC410).
52. TEAO .....	.....	.....	X	.....	.....	Totally-enclosed air-over; requires airflow from external source (IP54, IC417).
53. Fire Pump .....	X	.....	.....	.....	.....	When safety certification is not required. <i>See also</i> EPCA § 342(b)(1).
54. Non-continuous .....	.....	.....	.....	.....	X	EPCA covers only continuous ratings as general purpose electric motor (subtype I) and (subtype II).
55. Integral Brake Motor .....	.....	.....	.....	X	.....	Integral brake design factory built within the motor.

<sup>1</sup> Category I—General purpose electric motors (subtype I) or (subtype II) as defined in EPCA.  
 Category II—Specific purpose electric motors that *can be used in most general purpose applications*.  
 Category III—Definite purpose motors as defined in EPCA.  
 Category IV—Special purpose motors as defined in EPCA.  
 Category V—Outside the scope of General purpose electric motors (subtype I) or (subtype II) as defined in EPCA.

12. Appendix B to subpart B of part 431 is revised to read as follows:

**Appendix B to Subpart B of Part 431—Uniform Test Method for Measuring Nominal Full Load Efficiency of Electric Motors**

**1. Definitions**

Definitions contained in §§ 431.2 and 431.12 are applicable to this appendix.

**2. Test Procedures**

Efficiency and losses shall be determined in accordance with NEMA MG1–2009, paragraph 12.58.1, “Determination of Motor Efficiency and Losses,” (incorporated by reference, *see* § 431.15) and either:

- (1) CSA Standard C390–10 (incorporated by reference, *see* § 431.15), or
- (2) IEEE Standard 112–2004 Test Method B, *Input-Output With Loss Segregation*, (incorporated by reference, *see* § 431.15).

**3. Amendments to Test Procedures**

Any revision to IEEE Standard 112–2004 Test Method B, to NEMA Standards Publication MG1–2009, or to CSA Standard C390–10 (incorporated by reference, *see* § 431.15) subsequent to promulgation of this appendix B, shall not be effective for purposes of test procedures required under Part 431 and this appendix B, unless and until Part 431 and this appendix B are amended.

13. Section 431.441 is revised to read as follows:

**§ 431.441 Purpose and scope.**

This subpart contains definitions, test procedures, and energy conservation requirements for small electric motors, pursuant to Part A–1 of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317. This subpart does not cover “electric motors,” which are addressed in subpart B of this part.

14. In § 431.443, revise paragraphs (b)(1), (c)(1), and (c)(2), and add a new paragraph (b)(2) to read as follows:

**§ 431.443 Materials incorporated by reference.**

\* \* \* \* \*

(b) \* \* \*

(1) CAN/CSA–C747–09 (“CAN/CSA–C747”), *Energy efficiency test methods for small motors*, October 1, 2009, IBR approved for §§ 431.444; 431.447.

(2) CSA C390–10, *Test methods, marking requirements, and energy efficiency levels for three-phase induction motors*, March 22, 2010, IBR approved for §§ 431.444; 431.447.

(c) \* \* \*

(1) IEEE Standard 112–2004, (“IEEE Std 112”), *Test Procedure for Polyphase Induction Motors and Generators, Test Method A, Input-Output, and Test Method B, Input-Output with Loss Segregation*, 4 November 2004, IBR approved for §§ 431.444; 431.447.

(2) IEEE Standard 114–2001, (“IEEE Std 114”), *Test Procedure for Single-Phase Induction Motors*, 6 December 2001, IBR approved for §§ 431.444; 431.447.

15. In § 431.444, paragraph (b) is revised to read as follows:

**§ 431.444 Test procedures for the measurement of energy efficiency.**

\* \* \* \* \*

(b) *Testing and Calculations.* Determine the energy efficiency and losses by using one of the following test methods:

- (1) Single-phase small electric motors: Either IEEE 114–2001, (incorporated by reference, *see* § 431.443), or CAN/CSA C747, (incorporated by reference, *see* § 431.443);

(2) Polyphase small electric motors less than or equal to 1 horsepower (0.75 kW): Either IEEE 112–2004 Test Method A, (incorporated by reference, *see* § 431.443), or CAN/CSA C747, (incorporated by reference, *see* § 431.443); or

(3) Polyphase small electric motors greater than 1 horsepower (0.75 kW): Either IEEE 112–2004 Test Method, (incorporated by reference, *see* § 431.443), or CSA C390–10 (incorporated by reference, *see* § 431.443).

16. In § 431.445, paragraph (b)(5) is added and paragraph (c) is revised to read as follows:

**§ 431.445 Determination of small electric motor efficiency.**

\* \* \* \* \*

(b) \* \* \*

(5) *Use of a certification program.* (i) A manufacturer may have a certification program, that DOE has classified as nationally recognized under § 431.447, certify the average full load efficiency of a basic model of small electric motor, and issue a certificate of conformity for the small motor.

(ii) For each basic model for which a certification program is not used as described in paragraph (b)(5)(i) of this section, any testing of a motor to determine its energy efficiency must be carried out in accordance with paragraphs (b) and (c) of this section. (This includes testing of the basic model, pursuant to paragraph (b)(3)(i) of this section, to substantiate an AEDM.)

(c) *Additional testing requirements applicable when a certification program is not used—*(1) *Selection of basic models for testing.* (i) Basic models must be selected for testing in accordance with the following criteria:

(A) Two of the basic models must be among the five basic models that comply with § 431.446 and have the highest unit volumes of production by the manufacturer in the prior year, or during the prior 12 calendar month period beginning in 2015, whichever is later;

(B) The basic models should be of different horsepower without duplication;

(C) The basic models should be of different frame number series without duplication; and

(D) Each basic model should be expected to have the lowest average full load efficiency among the basic models with the same rating ("rating" as used here has the same meaning as it has in the definition of "basic model").

(ii) In any instance where it is impossible for a manufacturer to select basic models for testing in accordance with all of these criteria, the criteria shall be given priority in the order in which they are listed. Within the limits imposed by the criteria, basic models shall be selected randomly.

(2) *Selection of units for testing within a basic model.* For each basic model selected for testing, a sample of units shall be selected at random and tested. The sample shall be comprised of production units of the basic model, or units that are representative of such production units. The sample size shall be no fewer than five units, except when fewer than five units of a basic model would be produced over a reasonable period of time (approximately 180 days), then each unit shall be tested. When selecting a basic model for testing, components of similar design may be substituted without requiring additional testing if the represented measures of energy consumption satisfy the applicable sampling provision.

(3) *Applying results of testing.* In a test of compliance with a represented average efficiency:

The average full load efficiency of the sample  $X$ , which is defined by

$$\bar{X} = \frac{1}{n} \sum_{i=1}^n X_i$$

where  $X_i$  is the measured full load efficiency of unit  $i$  and  $n$  is the number of units tested, shall satisfy the condition:

$$\bar{X} \geq \frac{100}{1 + 1.05 \left( \frac{100}{RE} - 1 \right)}$$

where  $RE$  is the represented average full load efficiency.

17. A new § 431.447 is added to read as follows:

**§ 431.447 Department of Energy recognition of nationally recognized certification programs.**

(a) *Petition.* For a certification program to be classified by the Department of Energy as being nationally recognized in the United States for the purposes of Section 345(c) of EPCA ("nationally recognized"), the organization operating the program must submit a petition to the Department requesting such classification, in accordance with paragraph (c) of this section and § 431.448. The petition must demonstrate that the program meets the criteria in paragraph (b) of this section.

(b) *Evaluation criteria.* For a certification program to be classified by the Department as nationally recognized, it must meet the following criteria:

(1) It must have satisfactory standards and procedures for conducting and administering a certification system, including periodic follow up activities to assure that basic models of small electric motors continue to conform to the efficiency levels for which they were certified, and for granting a certificate of conformity.

(2) It must be independent of small electric motor manufacturers, importers, distributors, private labelers or vendors. It cannot be affiliated with, have financial ties with, be controlled by, or be under common control with any such entity.

(3) It must be qualified to operate a certification system in a highly competent manner.

(4) It must be expert in the content and application of the test procedures and methodologies in IEEE Standard 112–2004 Test Methods A and B, IEEE Standard 114–2001, CSA Standard C390–10, and CAN/CSA Standard C747–09 (incorporated by reference, see § 431.443) or similar procedures and methodologies for determining the energy efficiency of small electric motors. It must have satisfactory criteria and procedures for the selection and sampling of electric motors tested for energy efficiency.

(c) *Petition format.* Each petition requesting classification as a nationally recognized certification program must contain a narrative statement as to why the program meets the criteria listed in paragraph (b) of this section, must be signed on behalf of the organization operating the program by an authorized representative, and must be accompanied by documentation that supports the narrative statement. The following provides additional guidance as to the specific criteria:

(1) *Standards and procedures.* A copy of the standards and procedures for operating a certification system and for granting a certificate of conformity should accompany the petition.

(2) *Independent status.* The petitioning organization should identify and describe any relationship, direct or indirect, that it or the certification program has with an electric motor manufacturer, importer, distributor, private labeler, vendor, trade association or other such entity, as well as any other relationship it believes might appear to create a conflict of interest for the certification program in operating a certification system for compliance by small electric motors with energy efficiency standards. It should explain why it believes such relationship would not compromise its independence in operating a certification program.

(3) *Qualifications to operate a certification system.* Experience in operating a certification system should be discussed and substantiated by supporting documents. Of particular relevance would be documentary evidence that establishes experience in the application of guidelines contained in the ISO/IEC Guide 65, *General requirements for bodies operating product certification systems*, ISO/IEC Guide 27, *Guidelines for corrective action to be taken by a certification body in the event of either misapplication of its mark of conformity to a product, or products which bear the mark of the certification body being found to subject persons or property to risk*, and ISO/IEC Guide 28, *General rules for a model third-party certification system for products*, as well as experience in overseeing compliance with the guidelines contained in the ISO/IEC Guide 25, *General requirements for the competence of calibration and testing laboratories*.

(4) *Expertise in small electric motor test procedures.* The petition should set forth the program's experience with the test procedures and methodologies in IEEE Standard 112–2004 Test Methods A and B, IEEE Standard 114–2001, CSA Standard C390–10, and CAN/CSA Standard C747–2009 (incorporated by reference, see § 431.443) and with similar procedures and methodologies. This part of the petition should include description of prior projects, qualifications of staff members, and the like. Of particular relevance would be documentary evidence that establishes experience in applying guidelines contained in the ISO/IEC Guide 25, *General requirements for the competence of calibration and testing laboratories*, to energy efficiency testing for small electric motors.

(d) *Disposition*. The Department will evaluate the petition in accordance with § 431.448, and will determine whether the applicant meets the criteria in paragraph (b) of this section for classification as a nationally recognized certification program.

18. A new § 431.448 is added to read as follows:

**§ 431.448 Procedures for recognition and withdrawal of recognition of certification programs.**

(a) *Filing of petition*. Any petition submitted to the Department pursuant to § 431.447(a), shall be entitled “Petition for Recognition” (“Petition”) and must be submitted, in triplicate to the Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121. In accordance with the provisions set forth in 10 CFR 1004.11, any request for confidential treatment of any information contained in such a Petition or in supporting documentation must be accompanied by a copy of the Petition or supporting documentation from which the information claimed to be confidential has been deleted.

(b) *Public notice and solicitation of comments*. DOE shall publish in the **Federal Register** the Petition from which confidential information, as determined by DOE, has been deleted in accordance with 10 CFR 1004.11 and shall solicit comments, data and information on whether the Petition should be granted. The Department shall also make available for inspection and copying the Petition’s supporting documentation from which confidential information, as determined by DOE, has

been deleted in accordance with 10 CFR 1004.11. Any person submitting written comments to DOE with respect to a Petition shall also send a copy of such comments to the petitioner.

(c) *Responsive statement by the petitioner*. A petitioner may, within 10 working days of receipt of a copy of any comments submitted in accordance with paragraph (b) of this section, respond to such comments in a written statement submitted to the Assistant Secretary for Energy Efficiency and Renewable Energy. A petitioner may address more than one set of comments in a single responsive statement.

(d) *Public announcement of interim determination and solicitation of comments*. The Assistant Secretary for Energy Efficiency and Renewable Energy shall issue an interim determination on the Petition as soon as is practicable following receipt and review of the Petition and other applicable documents, including, but not limited to, comments and responses to comments. The petitioner shall be notified in writing of the interim determination. DOE shall also publish in the **Federal Register** the interim determination and shall solicit comments, data and information with respect to that interim determination. Written comments and responsive statements may be submitted as provided in paragraphs (b) and (c) of this section.

(e) *Public announcement of final determination*. The Assistant Secretary for Energy Efficiency and Renewable Energy shall as soon as practicable, following receipt and review of comments and responsive statements on the interim determination publish in the

**Federal Register** a notice of final determination on the Petition.

(f) *Additional information*. The Department may, at any time during the recognition process, request additional relevant information or conduct an investigation concerning the Petition. The Department’s determination on a Petition may be based solely on the Petition and supporting documents, or may also be based on such additional information as the Department deems appropriate.

(g) *Withdrawal of recognition—(1) Withdrawal by the Department*. If the Department believes that a certification program that has been recognized under § 431.447 is failing to meet the criteria of paragraph (b) of the section under which it is recognized, the Department will so advise such entity and request that it take appropriate corrective action. The Department will give the entity an opportunity to respond. If after receiving such response, or no response, the Department believes satisfactory correction has not been made, the Department will withdraw its recognition from that entity.

(2) *Voluntary withdrawal*. A certification program may withdraw itself from recognition by the Department by advising the Department in writing of such withdrawal. It must also advise those that use it (for a certification organization, the manufacturers) of such withdrawal.

(3) *Notice of withdrawal of recognition*. The Department will publish in the **Federal Register** a notice of any withdrawal of recognition that occurs pursuant to this paragraph (g).

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