

DEPARTMENT OF ENERGY**Office of Energy Efficiency and Renewable Energy****10 CFR Part 431**

[Docket No. EE-RM-96-400]

Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures, Labeling, and Certification Requirements for Electric Motors**AGENCY:** Office of Energy Efficiency and Renewable Energy, Department of Energy.**ACTION:** Proposed Rule and Public Hearing.

SUMMARY: The Energy Policy and Conservation Act, as amended, (the Act or EPCA) establishes energy efficiency standards and test procedures for commercial and industrial electric motors. EPCA also directs the Department of Energy (DOE or Department) to establish efficiency labeling requirements and compliance certification requirements for motors. Today, DOE proposes regulations to implement these requirements.

DATES: The Department will accept written statements, comments, data, and information regarding this notice no later than February 17, 1997.

Oral views, data, and arguments may be presented at the public hearing to be held in Washington, D.C., on January 15-16, 1997. Requests to speak at the hearing must be received by the Department no later than 4 p.m., January 6, 1997. Ten (10) copies of statements to be given at the public hearing must be received by the Department no later than 4 p.m., January 6, 1997. (See Section XIII-B below for further details.)

ADDRESSES: Written comments, written statements, and requests to speak at the public hearing, should be labeled "Electric Motor Rulemaking" (Docket No. EE-RM-96-400), and submitted to: U.S. Department of Energy, Office of Codes and Standards, EE-43, 1000 Independence Avenue, SW, Room 1J-018, Washington, DC 20585-0121. Telephone: (202) 586-7574.

The hearing will begin at 9:30 a.m. on January 15, 1997, and will be held at the U.S. Department of Energy, Forrestal Building, Room 1E-245, 1000 Independence Avenue, SW, Washington, DC.

Requests to speak may be hand delivered between the hours of 8 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Such requests should be labeled "Electric Motor

Rulemaking," Docket No. EE-RM-96-400, both on the document and on the envelope.

Copies of the transcript of the public hearing and public comments received may be read at the Freedom of Information Reading Room, U.S. Department of Energy, Forrestal Building, Room 1E-190, 1000 Independence Avenue, SW, Washington, DC 20585-0101, telephone (202) 586-6020, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

The Department proposes to incorporate by reference, test procedures from the Institute of Electrical and Electronics Engineers/American National Standards Institute (IEEE/ANSI), the National Electrical Manufacturers Association (NEMA), and the Canadian Standards Association (CSA). These test procedures are set forth in the standards publications listed below:

1. National Electrical Manufacturers Association Standards Publication MG1-1993 with Revision 1, "Motors and Generators," paragraph MG1-12.58.1, "Determination of Motor Efficiency and Losses."
2. Institute of Electrical and Electronics Engineers "Standard Test Procedure for Polyphase Induction Motors and Generators," IEEE 112-1991 (ANSI/IEEE 112-1992).
3. Canadian Standards Association "Energy Efficiency Test Methods for Three-Phase Induction Motors," C390-93.

Copies of these standards publications may be viewed at the Department of Energy Freedom of Information Reading Room at the address stated above. Copies of the National Electrical Manufacturers Association standards may also be obtained from the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209. Copies of the Institute of Electrical and Electronics Engineers standards may also be obtained from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, or the American National Standards Institute (ANSI), 11 West 42nd Street, 13th Floor, New York, NY 10036 as ANSI/IEEE 112-1992. Copies of Canadian Standards Association standards may also be obtained from the Canadian Standards Association, 178 Rexdale Boulevard, Rexdale (Toronto), Ontario, Canada M9W 1R3.

For more information concerning public participation in this rulemaking proceeding, see section XIII of this notice.

FOR FURTHER INFORMATION CONTACT:

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I. Introduction

A. Authority

Part B of Title III of the Energy Policy and Conservation Act of 1975, Pub. L. 94-163, as amended, by the National Energy Conservation Policy Act of 1978 (NECPA), Pub. L. 95-619, the National Appliance Energy Conservation Act of 1987 (NAECA), Pub. L. 100-12, the National Appliance Energy Conservation Amendments of 1988 (NAECA 1988), Pub. L. 100-357, and the Energy Policy Act of 1992 (EPA), Pub. L. 102-486, established the Energy Conservation Program for Consumer Products other than Automobiles. Part 3 of Title IV of NECPA amended EPCA to add "Energy Efficiency of Industrial Equipment," which includes electric motors. EPA also amended EPCA with respect to electric motors, providing definitions in section 122(a), test procedures in section 122(b), labeling provisions in section 122(c), energy efficiency standards in section 122(d), and compliance certification requirements in section 122(e).

EPCA defines "electric motor" as any motor which is "general purpose T-frame, single-speed, foot-mounting, polyphase squirrel-cage induction of the National Electrical Manufacturers Association (NEMA) Designs A and B, continuous-rated, operating on 230/460 volts and constant 60 Hertz line power, as defined in NEMA Standards Publication MG1-1987." EPCA section 340(13)(A), 42 U.S.C. 6311(13)(A).

EPCA then prescribes efficiency standards for electric motors that are 1 through 200 horsepower, and "manufactured (alone or as a component of another piece of equipment)," except for "definite purpose motors, special purpose motors, and those motors exempted by the Secretary." EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1). Furthermore, it provides for exemption of certain types or classes of electric motors. EPCA section 342(b)(2), 42 U.S.C. 6313(b)(2).

The Act also requires that testing procedures for motor efficiency shall be the test procedures specified in NEMA Standards Publication MG1-1987, and the Institute of Electrical and Electronics Engineers (IEEE) Standard 112 Test Method B for motor efficiency, as in effect on October 24, 1992. EPCA

section 343(a)(5)(A), 42 U.S.C. 6314(a)(5)(A). If the test procedure requirements of NEMA MG1-1987 and IEEE Standard 112 Test Method B for motor efficiency are amended, the Act directs the Secretary to amend these testing procedures to conform to such amended test procedures in the NEMA and IEEE standards, unless the Secretary determines, by rule, that to do so would not produce results that reflect energy efficiency, energy use, and estimated operating costs, and would be unduly burdensome to conduct. EPCA section 343(a)(5) (B) and (C), 42 U.S.C. 6314(a)(5) (B) and (C).

Additionally, EPCA directs the Secretary, after consultation with the Federal Trade Commission (FTC), to prescribe rules requiring motor labeling to indicate the energy efficiency on the permanent nameplate, to display the motor energy efficiency prominently in catalogs and other marketing materials, and to include other markings to facilitate enforcement of the energy efficiency standards. EPCA section 344(f), 42 U.S.C. 6315(f) and 344(d), 42 U.S.C. 6315(d).

Finally, the Act directs the Secretary to require motor manufacturers to certify compliance with the applicable energy efficiency standards through an independent testing or certification program nationally recognized in the United States. EPCA section 345(c), 42 U.S.C. 6316(c).

B. Background

The Department held a public meeting on June 2, 1995, to discuss issues and gather information related to the energy efficiency requirements for electric motors covered under EPCA, as amended. Comments were sought on the following issues: which equipment is covered by the statute; the nature and scope of required testing; use of independent testing and certification programs to establish compliance with applicable standards; the means of certifying such compliance to DOE; and possible labeling requirements.

Statements received after publication of the Notice of that public meeting in the Federal Register (60 FR 27051, May 22, 1995), and at the public meeting itself, have helped to refine the issues involved in this rulemaking, and have provided information that has contributed to DOE's proposed resolution of these issues. Portions of many of the statements are quoted and summarized in section III., Discussion of Proposed Rule. A parenthetical reference at the end of a quotation or passage in section III provides the location index in the public record of

the portion of a statement that is being quoted or discussed.¹

II. General Discussion

The Department's energy conservation program for consumer products is conducted pursuant to Part B of Title III of EPCA, 42 U.S.C. 6291-6309. Under EPCA, the consumer appliance standards program essentially consists of three parts: Testing; Federal energy conservation standards; and labeling. The appliance products covered by these parts include refrigerators and freezers, room air conditioners, central air conditioners and heat pumps, water heaters, furnaces, dishwashers, clothes washers and dryers, direct heating equipment, ranges and ovens, pool heaters, and fluorescent lamp ballasts. The program is codified in Title 10 of the Code of Federal Regulations, part 430—Energy Conservation Program for Consumer Products.

Since 10 CFR part 430 covers consumer products as distinct from commercial and industrial equipment, the Department proposes to create a new part 431 in the Code of Federal Regulations (10 CFR part 431), Energy Conservation Program for Commercial and Industrial Equipment, to cover certain commercial and industrial equipment covered under the Act. These include commercial heating and air-conditioning equipment, water heaters, certain lighting products, distribution transformers, and electric motors. This new commercial and industrial equipment program will consist of the same elements as the program covering consumer products: Testing; Federal energy efficiency standards; labeling; and certification and enforcement.

The Department of Energy today proposes to incorporate the energy efficiency standards and test procedures prescribed by EPCA for commercial and industrial electric motors, provisions to clarify and implement those requirements, and energy efficiency labeling and certification requirements for such motors into the new part 431. These include: Definitions in accordance with section 340(13)(A) of EPCA, 42 U.S.C. 6311(13)(A); test procedures prescribed by section 343(a)(5)(A) of EPCA, 42 U.S.C. 6314(a)(5)(A); standards prescribed section 342(b)(1) of EPCA, 42 U.S.C.

¹ Example: "(ACEEE, No. 7 at 3.a.2.))" refers to (1) a statement that was submitted by the American Council for an Energy Efficient Economy and is recorded in the DOE Freedom of Information Reading Room in the docket under "Motors Workshop," June 2, 1995, as comment number seven; and (2) a passage that appears in paragraph 3.a.2. of that statement.

6313(b)(1); labeling requirements in accordance with section 344(d) of EPCA, 42 U.S.C. 6315(d); compliance certification requirements in accordance with section 345(c) of EPCA, 42 U.S.C. 6316(c).

Among the matters DOE addresses in this Notice are requirements for testing by manufacturers (including provisions as to confidence levels for results and sample size), use of mathematical methods to calculate energy efficiency as an alternative to actual testing, accreditation of testing laboratories, recognition of certification programs, testing during enforcement proceedings, and information to be displayed on a motor nameplate. The Department is incorporating from 10 CFR part 430 procedures for waiver of test procedures, procedures to exempt state regulation from preemption, and provisions for imported and exported equipment.

III. Discussion of Proposed Rule

A. Definitions

1. Electric Motor

EPCA prescribes energy efficiency standards for each "electric motor" with a horsepower rating from 1 through 200 horsepower and certain other characteristics. EPCA section 342(b), 42 U.S.C. 6313(b). "Electric motor" is defined 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 ("NEMA") 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" (NEMA MG1-1987). EPCA section 340(13)(A), 42 U.S.C. 6311(13)(A). The Department is concerned, however, that many of the terms in the foregoing definition are not sufficiently clear to identify which motors should be covered by the regulations.

NEMA suggests that DOE adopt a definition of "electric motor" which clarifies those terms as follows: (1) "Continuous rated" refers to "continuous duty operation;" (2) "Foot-mounting" encompasses foot-mounting "motors with flanges and motors with explosion proof construction," but flange-mounting motors without feet are not included; and (3) "Operating on 230/460 volts" applies to "motors that are rated at 230 volts, 460 volts, or multi-voltages that include 230 and/or 460 volts," and to motors that are "arbitrarily rated at voltages other than 230 or 460 volts, but that may be operated on 230 and/or 460 volts, or any

combination of the two." (NEMA, No. 9 at A.1.).

The Department agrees with and is proposing to adopt these NEMA proposals. (NEMA proposals to include metric equivalent motors within the definition of "electric motor" are discussed below.) In addition, as to the term "foot-mounting," the Department proposes to make clear that motors with detachable feet are included within the definition of "electric motor." The Department also proposes to add a definition to clarify the term, "general purpose" motor. The definition is drawn, in part, from language suggested by NEMA (Reliance, No. 8 at 3.a.3; NEMA, No. 9 at 4.; and Public Meeting, Tr. pgs. 36-41) and is discussed at greater length in section III.A.4. below. The definition of "general purpose" motor would give effect to the statutory definitions of both "electric motor" and "definite purpose motor." The Department understands that some motors are essentially general purpose motors with, for example, minor modifications such as the addition of temperature sensors or a heater, or modifications in exterior features such as 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. DOE does not believe that the modifications justify excluding these motors from meeting statutory energy efficiency levels, or that Congress intended to exclude them from coverage.

2. Metric Equivalents

EPCA defines "electric motor" on the basis of NEMA Standards Publication MG1-1987, Motors and Generators. EPCA section 340(13)(A), 42 U.S.C. 6311(13)(A). The definition provides, for example, that the motor must be "a general purpose T-frame, . . . squirrel-cage . . . motor of the (NEMA) Design A and B . . . as defined in . . . MG1-1987." The Act prescribes nominal full load energy efficiency standards for electric motors that have certain combinations of horsepower, number of poles (speed in revolutions per minute), and enclosure type, EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1), all of which are based on the construction and rating system in NEMA MG1-1987 which utilizes English or customary units of measurement. The specific combinations in the statute are the typical motors available in the United States, and such motors constructed in accordance with the standards in MG1 are often referred to as "NEMA motors."

By contrast, general purpose electric motors manufactured outside the United States and Canada are defined and described with reference to International Electrotechnical Commission (IEC) Standard 34 series, Rotating electrical machines, which employs terminology and criteria different from those used in the EPCA definition for motors. The performance attributes of these "IEC motors" are rated pursuant to IEC Standard 34-1, Rating and performance, which uses metric units of measurement and a different construction and rating system than NEMA MG1-1987. It employs, for example, units such as kilowatts instead of horsepower. As with NEMA motors, standard IEC motors exist, consisting of specific combinations of kilowatts and other IEC rating factors.

Although 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.

The Department understands that IEC motors generally can perform the identical functions of NEMA 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.

It is also DOE's understanding, however, that small differences between the two types of motors affect their suitability for particular applications. For example, IEC motors tend to be slightly smaller than comparable NEMA motors and the shaft dimensions of the two types of motors are slightly different. Thus, in some situations, differing physical characteristics could render it difficult or impossible to install one type of motor in a piece of machinery designed to be operated by the other type. By way of further example, IEC motors have higher in-rush currents than comparable NEMA motors, and thus will tend to start and reach normal performance levels more slowly than NEMA motors. Consequently, IEC motors will not be suitable for machinery requiring a high torque start, but will be more suitable where a gradual start is appropriate.

As mentioned above, IEC motors are designed and rated according to criteria in IEC Standard 34-1, whereas EPCA defines electric motor in terms of design and rating criteria set forth in NEMA

MG1. It is DOE's understanding that the differences in criteria concern primarily nomenclature, units of measurement, standard motor configurations, and design details, but have little bearing on motor function. For example, under EPCA, an electric motor must be a "squirrel cage" motor (i.e., have a certain physical shape) and be "continuous rated" (i.e., designed for continuous operation). IEC Standard 34-1 does not use either of these terms, but uses the term "cage" to refer to the same shape as is referred to by the term "squirrel cage," and uses the term "duty type S-1" to refer to motors designed for continuous operation.

Similarly, the different measures for rating motor power—IEC Standard 34-1 uses kilowatts and NEMA's Publication MG1-1987 uses horsepower—do not affect the quality or quantity of a given motor's power. They are simply different ways to express that power. Under well established rules for conversation, one horsepower equals .746 kilowatts, and one kilowatt equals 1.34 horsepower. Thus, for example, a standard 5 horsepower motor has an output that can also be expressed as 3.73 kilowatts, and a standard 15 kilowatt motor has a horsepower of 20.1.

As commenters indicated, however, the standard power ratings for IEC and NEMA motors are not exactly equal, although the differences are slight. A standard 7.5 horsepower motor, for example, would have an exact metric equivalent of 5.59 kilowatts, but the closest equivalent standard power for an IEC motor is 5.5 kilowatts. (WE, No. 2 at 3a(1); Reliance, No. 8 at 3.a.1). IEC publishes a table of standard kilowatt ratings and equivalent standard horsepower ratings for general purpose motors, in IEC 72-1, Dimensions and output series for rotating electrical machines, (6th ed. 1991-02), section D.5.1, at page 119. (NEMA, No. 9 at Exhibit 1) The table shows a very close match between the two sets of standard ratings. For example, the standard 5 horsepower and 15 kilowatt motors mentioned above equal 3.73 kilowatts and 20.1 horsepower, respectively, and the IEC table shows that corresponding standard IEC and NEMA motors are 3.7 kilowatts and 20 horsepower. This close match between standard power ratings tends to support the conclusion that EPCA requirements cover IEC motors, although the differences do raise an issue, discussed below, as to how EPCA's efficiency standards *apply* to IEC motors.

Several commenters asserted that IEC motors should be covered by EPCA's efficiency standards. (ACEEE, No. 7 at

3.a.1; Brook Hansen, No. 5; Reliance, No. 8 at 3.a.1; NEMA, No. 9 at A.2.). The American Council for an Energy-Efficient Economy (ACEEE) states that "metric rated motors should be considered covered by the standard, and that the minimum efficiency of the class (open or closed and number of poles) for the corresponding equivalent or next-highest power rating NEMA motors be applied. Efficiency of metric motors must be determined by IEEE method 112(b) or CSA C390." (ACEEE, No. 7 at 3.a.1). In explaining its view, Reliance Electric Company (Reliance) states as follows: "An equivalent IEC motor exists for each NEMA motor identified in the Act. IEC and NEMA motors can be used interchangeably in most general purpose applications. Placing efficiency requirements on NEMA horsepower rated motors but not on IEC equivalent motors may give preferential treatment to the IEC motors which may be offered at lower than the required efficiency levels. It is therefore in the interest of the intended goal of energy conservation to include coverage of IEC or metric motors in the proposed rules to implement the EPAct requirements for motors." (Reliance, No. 8 at 3.a.1).

One element of EPCA's definition of "electric motor" is that the motor be a NEMA "T-frame" motor, meaning that it meets certain dimensional standards. In asserting that IEC motors are covered by the Act, NEMA indicates that certain IEC motors have dimensions comparable to T-frame motors, and states that DOE's regulations should make clear these IEC motors are covered. EPCA also states that an "electric motor" must be NEMA "Design A and B." NEMA asserts that IEC Design N motors are comparable to the NEMA Design A and B motors. (NEMA, No. 9 at A.1.).

The Department interprets the Act as requiring that IEC motors satisfy the same energy efficiency requirements that the statute applies to identical or equivalent to NEMA motors. Thus, under the regulation proposed today, the definition of "electric motor" includes IEC motors that have physical and performance characteristics which are either identical or equivalent to the characteristics of NEMA motors that fit within the statutory definition. In the Department's view, there can be no question that EPCA's requirements cover any motor whose physical and performance characteristics fit within the statutory definition of "electric motor." This is true regardless of the measuring units used to describe the motor's performance or characteristics, or of the criteria pursuant to which it was designed.

The Department also understands that comparable IEC and NEMA motors typically are closely equivalent but not identical, and that the characteristics of many IEC motors closely match EPCA's definition of "electric motor" but deviate from it in minor respects. It also appears that, for most general purpose applications, such IEC motors can be used interchangeably with the NEMA motors. In addition, as discussed below, the efficiency standards prescribed for standard horsepower motors are readily applicable to both standard and non-standard kilowatt motors. The Department believes that a broad exclusion of IEC motors from energy efficiency requirements would conflict with the energy conservation goal of the Act, was not intended by Congress, and would be irrational. Furthermore, the Department agrees with the views of commenters that placing energy efficiency requirements on NEMA motors but not on equivalent IEC motors could have the effect of giving preferential treatment to the IEC motors. Thus, the Department construes the EPCA definition of electric motor to include motors that have characteristics equivalent to those set forth in that definition.

Finally, statements at the public meeting and in written comments addressed whether IEC 100 millimeter frame size motors in particular are covered by energy efficiency requirements. As previously stated, the statutory definition of "electric motor" incorporates frame size by requiring a motor to be "T-frame" as defined in NEMA MG1-1987. NEMA states that the IEC 100 millimeter frame motor is equivalent to the discontinued NEMA 160 frame size (NEMA, No. 9 at A.2.), and examination of NEMA MG1-1987 confirms that it does not include T-frame motors that are 160 series. Therefore, since the IEC 100 frame motor apparently is not equivalent to any T-frame motor, it appears not to be covered by the Act.

3. Basic Model

It is common for a single motor manufacturer to make numerous models of the electric motors covered by EPCA, and under the Act each model is potentially subject to testing for energy efficiency. Often, however, several models are essentially the same motor, but with each model having some refinement that does not significantly affect the energy efficiency or performance of the motor. One way to meet the EPCA mandate that test procedures "not be unduly burdensome to conduct," EPCA section 343(a)(2), 42 U.S.C. 6314(a)(2), is to determine which

models have electrical and mechanical characteristics, such as horsepower, speed, and enclosure type, that are essentially identical. Each such group of models would be categorized into a family and only representative samples within each family would be tested. The Department proposes to use the term "basic model" to identify a family of commercial or industrial motors, following the approach it employs for residential appliance products.

With regard to the residential appliance program, the term "basic model" is defined as follows: "Basic model means all units of a given type of covered product (or class thereof) manufactured by one manufacturer and— . . . [as to dishwashers, for example] which have electrical characteristics that are essentially identical, and which do not have any differing physical or functional characteristics which affect energy consumption." 10 CFR 430.2. "Basic model" is a term used to describe products or items of equipment whose performance, design, mechanical, and functional characteristics are essentially the same. Components of similar design may be substituted in a basic model without requiring additional testing if the represented measures of energy consumption continue to satisfy applicable provisions for sampling and testing. In the case of electric motors, a manufacturer may produce numerous models that have different model numbers but are essentially the same, all based on variations in design features that do not affect energy consumption.

In the notice of public meeting that solicited comments on issues involved in this rulemaking, the Department stated that it was considering the following definition of "basic model" for electric motors:

all units . . . manufactured by one manufacturer and . . . having the same rating, electrical characteristics that are essentially identical, and no differing physical or functional characteristics which affect energy consumption or efficiency.

60 FR at 27052. Underwriters Laboratories Inc. (UL), ACEEE, and NEMA all support such a definition. (UL, No. 4 at "Basic Model"; ACEEE, No. 7 at 3.a.2; NEMA, No. 9 at A.3.) The Department proposes to adopt this definition of "basic model."

NEMA suggests that the proposed rule require each basic model to consist of units that have one of the 113 combinations of horsepower (or kilowatts), number of poles, and open or closed construction for which section 342(b)(1) of EPCA, 42 U.S.C. 6313(b)(1), specifies an efficiency standard. NEMA,

as well as Reliance, suggest that this proposal be implemented by defining the term "rating," which is part of the basic model definition, as being one of the 113 combinations in EPCA section 342(b)(1). (For this purpose, NEMA proposes that motors with a horsepower rating between two levels specified in the Act be treated as having the higher level, i.e. their horsepowers would be "rounded up.") The Department agrees with these suggestions by NEMA and Reliance, and in the attached rule proposes to adopt them, with one exception. Rather than "rounding up" all horsepowers that are at levels between those specified in section 342(b)(1) of EPCA, DOE would use the rounding method described in Part III–D–1 below.

The Department believes the foregoing approach to defining "basic model" is a sound means to reduce the burden of testing. It would apply an approach to electric motors that has proven effective in the residential appliance program, but with appropriate modifications given the nature of these motors.

4. General Purpose Motor, Definite Purpose Motor, and Special Purpose Motor. As already discussed, EPCA prescribes efficiency standards for certain "electric motors." EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1). The standards do not apply to "definite purpose motors" or "special purpose motors." These three terms are defined as follows:

The term "electric motor" means 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. EPCA section 340(13)(A), 42 U.S.C. 6311(13)(A). (Emphasis added.)

The term "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 or for use on a particular type of application and which cannot be used in most general purpose applications. EPCA section 340(13)(B), 42 U.S.C. 6311(13)(B).

The term "special purpose motor" means 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 section 340(13)(C), 42 U.S.C. 6311(13)(C).

The definitions are not straightforward, however, and raise questions as to which motors the efficiency standards apply to. The Department is also concerned about the possibility that a

manufacturer could make modifications to an "electric motor" subject to efficiency standards, particularly minor modifications, and improperly claim that the motor is an exempt definite or special purpose motor. To address these concerns, the Department proposes (1) a definition of "general purpose motor," which is a term used as part of EPCA's definition of "electric motor" but is not itself defined in EPCA, and (2) to define "special purpose motor" using language that is different from the wording of the EPCA definition of that term, but that has the same meaning as the statutory definition. The Department also proposes to adopt verbatim the statutory definition of "definite purpose motor."

Before discussing these proposals, the Department notes that the terms EPCA uses to refer to particular motors may differ from terms commonly used in the industry. The Department understands, for example, that the term "stock motor," rather than "general purpose motor," is often used to refer to standard motors typically sold through distributors, and that "custom motor" refers to a motor designed for use in unusual conditions, or for particular applications or types of applications. As indicated below, depending upon its precise characteristics, such a "custom motor" could be either a definite, special or even general purpose motor as those terms are used in EPCA. To avoid confusion, and because this notice concerns rules to implement EPCA, the discussion here uses the terms used in the statute. The industry should keep in mind, however, that the failure here to use a common designation for a type of motor, such as "stock motor," does not mean that such type of motor is not addressed by this notice.

Section 340(13) of EPCA clearly defines electric, definite purpose and special purpose motors as being mutually exclusive. In the definition of "electric motor," relevant for present purposes is that it must be "a general purpose . . . motor." By contrast, "definite purpose motor" is defined in part as a motor that "cannot be used in most general purpose applications," and "special purpose motor" is defined in part as "other than a general purpose . . . or definite purpose motor." The Act does not clearly spell out, however, the precise distinctions between these different types of motors.

Section 340(13)(A) of EPCA provides that the definition of "general purpose motor" shall be drawn from NEMA MG1–1987. That NEMA MG1–1987

definition, in pertinent part, is as follows:²

. . . designed in standard ratings with standard operating characteristics and mechanical construction for use under usual service conditions without restriction to a particular application or type of application.

NEMA suggests that the Department adopt this language, with minor modifications, as the sole definition of "general purpose." This definition appears to complement the NEMA MG1-1987 definition of "definite purpose motor," which in essence is *part* of the EPCA definition of that term, and which reads as follows:

. . . any motor designed in standard ratings with standard operating characteristics or mechanical construction for use under service conditions other than usual or for use on a particular type of application.

NEMA MG1-1.09. These two definitions do not overlap, and appear to include virtually all motors with standard designs. They appear to contemplate that a general purpose motor modified so as to be suitable for unusual conditions or a particular type of application would be classified as a definite purpose motor.

But the EPCA definition of "definite purpose motor" states in addition that the motor "cannot be used in most general applications." Thus, for example, a general purpose motor modified so as to be suitable for use on a particular application, but that *can* still be used in most general purpose applications, is not a "definite purpose motor" under the statute. The same would be true of a motor designed with standard ratings and operating characteristics, but for use under unusual service conditions, and which is also capable of most general purpose uses. Nor would such motors be within the NEMA MG1-1987 definition of "general purpose motor," since they are not designed "for use under usual service conditions without restriction to a particular application." The NEMA MG1-1987 definition of "general purpose motor," therefore, does not closely complement the *statutory* definition of "definite purpose motor." If the Department were to adopt the NEMA MG1-1987 definition of "general purpose motor," as suggested by NEMA, certain motors of standard design would be neither "general purpose" nor

"definite purpose" (nor "special purpose") under the regulations. Consequently, they would not be covered by efficiency standards, or excluded from coverage. The Department believes this would be an unsound interpretation of EPCA.

In the Department's view, a motor designed with standard features (i.e. with standard ratings, and standard operating characteristics or mechanical construction) for use under unusual conditions or for a particular type of application, and that can still "be used in most general purpose applications," EPCA section 340(13)(B), 42 U.S.C. 6311(13)(B), is covered by the statute. That type of motor is specifically excluded from the definition of "definite purpose motor." We are aware of no reason why Congress would have created such an exclusion other than to require that such motors meet efficiency standards. The statute states that definite purpose motors need not meet the standards. The sole reason for carving out from that classification a type of motor that would otherwise fall within it, would be to require that the motor meet the efficiency standards.

The Department's interpretation of EPCA also will serve the energy conservation goals of the statute and makes sense as a practical matter. First, there seem to be strong reasons in favor of, and no reasons against, applying the standards to any motor that is designed in standard ratings, has standard operating characteristics or mechanical construction, and is capable of being used in most general purpose applications, even if it is designed for a particular use. The Department understands that the features making such a motor suitable for a particular use have little or no effect on the performance of the motor as such, or on its efficiency. Moreover, it appears that often a particular use motor of a given rating, and a motor of the same rating that meets the definition of "general purpose" under NEMA MG1-1987, would be the same "basic model," and be equally capable of meeting efficiency standards. Thus, particular use motors that can be used in general purpose applications should be treated the same under EPCA as general purpose motors, and energy savings achieved under the Act would be enhanced by applying its standards to such particular use motors.

Second, this interpretation of EPCA addresses a possible means of evading the statute, by reducing the risk that general purpose motors that comply with EPCA's efficiency standards will be replaced by definite purpose motors that do not. To manufacture a general purpose motor that complies with EPCA

may sometimes be more burdensome than to manufacture a non-complying general purpose motor that has been modified to be suitable for certain definite purpose uses, but that remains capable of satisfying most general purpose applications. For example, a non-complying general purpose motor could be modified by adding a heater to make it suitable for use in certain high humidity conditions, or by adding screening (to an open motor) to protect against invasion by rodents in applications such as agricultural environments. It might be cheaper to manufacture such motors than to manufacture a comparable general purpose motor that meets EPCA's energy efficiency standards. In such a situation, a manufacturer would have an incentive to try to sell the modified, non-complying motor in the general purpose market. The statutory definition of "definite purpose motor" appears designed to prevent that result.

Based on the foregoing, the Department proposes a two-part definition of "general purpose motor." The first part in essence provides that a motor is "general purpose" if it meets the criteria in NEMA MG1-1987, and largely incorporates the language suggested by NEMA. (NEMA, No. 9 at A.4.). This includes NEMA's suggestion that section 14.02 of NEMA MG1-1993 be cited as providing examples of "usual service conditions," although not its suggestion that the words "for general purpose applications" be included in the definition. The latter language is not in the NEMA MG1 definition of "general purpose," and appears to be redundant here. The second part of the Department's proposed definition in effect provides that, alternatively, a motor is also "general purpose" if it meets the EPCA criteria for a definite purpose motor except that it can be used in most general purpose applications.

As stated above, the Department is proposing to adopt without change the EPCA definition of "definite purpose motor." One element of that definition is that a motor be designed for "service conditions other than usual." The Department agrees with and accepts the comments that an exhaustive list of such conditions cannot be developed, and should not be included in the regulations. (Reliance, No. 8 at 3.a.3; NEMA, No. 9 at A.4.). ACEEE "recommends that 'definite purpose' motors be defined as all motors that do not meet the specifications for 'usual service conditions' as defined in NEMA MG1-1993-14.02." (ACEEE, No. 7 at 3.a.3). The Department declines to accept that suggestion because it agrees

²The definition is contained in section MG 1-1.05 of NEMA MG1-1987. Other parts of the definition are either incorporated directly into the EPCA definition of "electric motor," incorporated into other statutory provisions, or grouped with such elements. The Department believes that those portions of section MG1-1.05 are irrelevant for purposes of defining "general purpose" in the DOE regulations.

with NEMA and Reliance that section 14.02 does not provide a conclusive list of "usual service conditions."

NEMA recommends that "motors designed for explosion-proof conditions, which could be considered an unusual service condition under NEMA MG1-1993, be expressly defined as covered products. The Act expressly authorizes a two-year extension of the effective date for efficiency standards for 'motors which require listing or certification by a nationally recognized safety testing laboratory.' EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1). This reference was intended to apply to explosion-proof motors which, despite their use in unusual service conditions, are otherwise general purpose motors." (NEMA, No. 9 at A.4.). The Department agrees with NEMA that explosion-proof motors are covered by EPCA, and believes that the proposed definition of "general purpose motor" would include such motors and therefore render them subject to the efficiency requirements. Nevertheless, to avoid possible uncertainty, and to address NEMA's concern, the Department proposes to accept NEMA's suggestion that explosion-proof motors be expressly defined as covered products. The proposed definition of "electric motor," therefore, includes such motors.

Finally, the Department believes there is potential for uncertainty as to whether particular motors meet EPCA's definition of "special purpose motor," or instead are "general purpose" or "definite purpose" motors. Although the definition of "special purpose motor" states in part that it is "other than a general purpose motor or a definite purpose motor," the remaining criteria defining a special purpose motor closely resemble certain of the criteria defining a definite purpose motor. Significant potential exists for misclassifying a motor, because fine distinctions must sometimes be made to determine precisely which set of criteria a motor meets. Such determinations can be significant, because if a motor meets the "definite purpose" criteria, it would be covered by the standards if it can be used for most general purpose applications. The Department therefore proposes a definition of "special purpose motor" that clarifies the EPCA definition but does not alter its substance, i.e., the proposed definition includes the same motors as the statutory definition. As suggested by NEMA, the Department does not attempt to elaborate on the statutory definition of "special purpose motor."

5. Enclosed Motor and Open Motor

The Department proposes to incorporate the statutory definitions of the terms "enclosed motor" and "open motor."

6. Efficiency and Nominal Full Load Efficiency

The Department proposes to incorporate the statutory definition of the term "efficiency" into a definition of "average full load efficiency." Under the Act and the proposed regulations, it is the average full load efficiency of a motor that must be measured through test procedures. The proposed rule also defines "nominal full load efficiency" in terms that differ from the language used in the statute to define that term, and that clarify and implement, but do not deviate from, the substance of the statutory definition.

B. Test Procedures for the Measurement of Energy Efficiency

EPCA requires that the regulatory test procedures for electric motors shall be the test procedures specified in NEMA MG1-1987 and IEEE Standard 112 Test Method B for motor efficiency, as in effect on the date of the enactment of EPCA. EPCA section 343(a)(5)(A), 42 U.S.C. 6314(a)(5)(A). If the test procedures in NEMA MG1 and IEEE Standard 112 are subsequently amended, the Secretary is required to revise the regulatory test procedures for electric motors to conform to such amendments, unless the Secretary determines by rule, supported by clear and convincing evidence, that to do so would not meet the requirements for test procedures described in sections 343(a)(2) and (3) of EPCA, 42 U.S.C. 6314(a)(2) and (3).³ EPCA section 343(a)(5)(B), 42 U.S.C. 6314(a)(5)(B).

NEMA MG1-1987 was revised and superseded by NEMA MG1-1993, which was issued on November 19, 1992, and published in October 1993.

³ Section 343(a)(2) of EPCA reads as follows: "Test procedures prescribed in accordance with this section shall be reasonably designed to produce test results which reflect energy efficiency, energy use, and estimated operating costs of a type of industrial equipment (or class thereof) during a representative average use cycle (as determined by the Secretary), and shall not be unduly burdensome to conduct."

Section 343(a)(3) of EPCA reads as follows: "If the test procedure is a procedure for determining estimated annual operating costs, such procedure shall provide that such costs shall be calculated from measurements of energy use in a representative average-use cycle (as determined by the Secretary), and from representative average unit costs of the energy needed to operate such equipment during such cycle. The Secretary shall provide information to manufacturers of covered equipment respecting representative average unit costs of energy."

Revision 1 to NEMA MG1-1993, was added on December 7, 1993. Whereas NEMA MG1-1987 required "efficiency and losses" to be determined in accordance with IEEE Standard 112, NEMA MG1-1993 with Revision 1 now permits such determinations based on application of either IEEE Standard 112 or Canadian Standards Association (CSA) Standard C390. In addition, whereas NEMA MG1-1987 was silent on determination of motor efficiency for polyphase motors greater than 125 horsepower covered by the statute, NEMA MG1-1993 with Revision 1 now permits testing such motors in accordance with IEEE 112, with stray-load loss determined by direct measurement or indirect measurement. Since enactment of section 343(a)(5)(B) of EPCA, no other substantive amendments have been made to the test procedures in either NEMA MG1-1987 or IEEE Standard 112 Test Method B.

ACEEE, Reliance, and NEMA support the adoption of NEMA MG1-1993 with Revision 1. ACEEE explains that the CSA Standard C390-93 test procedures are a refinement of the IEEE 112 Test Method B, offering advantages in clarity which can lead to greater reproducibility of test results. (ACEEE, No. 7 at 3.b.1).

The Department will adopt the new test procedure provisions of NEMA MG1-1993 with Revision 1, to permit use of CSA Standard C390-93 Test Method (1) and testing covered motors greater than 125 horsepower. The Department does not intend to determine that these amendments to MG1-1987 fail to meet the requirements of sections 343(a)(2) and (3) of EPCA.

C. Units to be Tested

EPCA requires that the test procedures prescribed for motors by DOE be "reasonably designed to produce test results which reflect energy efficiency," yet not be "unduly burdensome" to conduct. EPCA § 343(a)(2), 42 U.S.C. 6314(a)(2). Efficiency testing of each unit of an electric motor covered by EPCA could take ten to twelve hours and cost up to \$2,000.00. As discussed above, the classification of motors into "basic models" is one step to prevent expenditure of excessive time and money on testing. The Department also proposes to permit use of a statistically meaningful sampling procedure for selecting test specimens, so as to further reduce the testing burden on manufacturers while giving sufficient assurance that the true mean energy efficiency of a basic model meets or exceeds the applicable energy efficiency standard established in EPCA. But

notwithstanding adoption of these measures, because a motor manufacturer sometimes will produce a substantial number of basic models, it could still face a potentially substantial testing burden. Therefore, the Department also proposes to permit use of alternative methods, other than actual testing, for determining the efficiency of some basic models.

ACEEE, Reliance, and NEMA assert that it is impractical to require testing of every motor manufactured, or even of samples of each basic model. They find it acceptable to randomly test representative samples of some motor designs, and to use alternative methods for determining the efficiency of other motors. The purpose of sample testing would be to determine whether the average full load efficiency of the basic model meets or exceeds the EPCA requirement, not to confirm the efficiency level of each individual motor. (ACEEE, No. 7 at 3.b.2 & 3.b.3; Reliance, No. 8 at 3.b.2; and NEMA, No. 9 at B.2). Underwriters Laboratories (UL, No. 4 at "Testing Sampling Plan"), Reliance and NEMA describe various methods of determining the number of motors to be tested, including 100 percent of production, sampling by attributes according to Military Standard MIL-STD-105E, and sampling a minimum of five units produced over a specified time, such as two months.

The Department reviewed the industry sampling recommendations and other sampling systems that could provide guidance as to how many and which units should be tested to determine compliance. Criteria used by the Department in this process include:

- (1) Minimizing manufacturer's testing costs;
- (2) Limiting the calendar time required for testing;
- (3) Assuring compatibility with the sampling plan promulgated for the Department's commercial labeling program;
- (4) Providing a high statistically valid probability that basic models that are tested meet applicable energy efficiency standards; and
- (5) Providing a high statistically valid probability that a manufacturer preliminarily found to be in noncompliance will actually be in noncompliance.

Based on a review of the industry statements, three alternatives as to sample size were considered:

- (1) Test the total population (100%) of covered equipment;
- (2) For each basic model, test a predetermined fixed number of production units; and

(3) For each basic model, test one unit at a time or batches, until a determination can be made that the basic model is in compliance or noncompliance.

Explanations of all three sampling procedures are contained in the "Final Rulemaking Regarding the Sampling Requirements of Consumer Product; Test Procedures," 44 FR 22410-18 (April 13, 1979) and the "Energy Conservation Program for Consumer Products," 45 FR 43976-44087 (June 30, 1980).

The first sampling procedure would test every unit of a covered motor and is the only way to determine with 100 percent certainty that every motor manufactured is in compliance with the statute. Even assuming such approach is authorized by the Act, the cost and time constraints associated with this alternative make it infeasible.

A second alternative is to test a predetermined fixed number of production units for each basic model. In order to use this approach, sufficient numbers of units must be tested to yield results with high levels (e.g. 90 percent) of statistical confidence. The determination of the number of units to be tested is based in part on expected unit-to-unit variability. However, reliable estimates of unit-to-unit variability of motors are often unavailable and significant differences may exist among basic models and manufacturers. Thus, the Department concludes that a single sample size giving sufficiently high assurance of compliance cannot be established that will apply to all motors and manufacturers, and that will not impose unreasonably high testing costs for some manufacturers.

The third alternative considered was testing until a determination can be made that a basic model is in compliance or noncompliance. In this alternative, the size of the total sample is not determined in advance. Instead, after each unit or group of units is tested, a decision is made to (1) accept, (2) reject, or (3) suspend judgment and continue testing additional sample units until a decision is ultimately reached. This method often permits reaching a decision on the basis of fewer tests than fixed number sampling plans. The Department notes that this third alternative is the basis for most of the statistical sampling procedures established for consumer appliance products at 10 CFR 430.24, Units to be Tested. The Department proposes to adapt such sampling procedures to electric motors. The Department believes that motor manufacturers utilizing production techniques that

assure low variance among units of a particular basic model could test fewer units to demonstrate compliance.

In the case of actual testing, the proposed procedures require a sample of units of a basic model to be randomly selected and tested. A simple average of the values would be calculated, which would be the actual mean value of the sample. For each basic model of electric motor, a sample of sufficient size would be selected at random and tested to ensure that any represented value of energy efficiency is no greater than the lower of (A) the mean of the sample or (B) the lower 90 percent confidence limit of the mean of the entire population of that basic model, divided by a coefficient applicable to the represented value. The coefficient applicable to a given represented value would be the ratio of the minimum efficiency, as provided in NEMA MG1-1993, Table 12-8, to the corresponding nominal full load efficiency in Table 12-8 that (1) equals the represented value, or (2) is the closest lower value to the represented value. Thus, the coefficient would be derived from the 20 percent loss difference on which NEMA bases the minimum efficiency in Table 12-8.

This approach is similar to the methodology used in the Department's consumer appliance program, which is intended to provide an acceptable level of assurance that test results will be applicable to all units of a basic model, without creating an undue testing burden for manufacturers. Like the consumer appliance program, the sampling plan for electric motors incorporates a confidence limit approach, which would give assurance at a specified level of confidence that the mean efficiency of the total population of units being manufactured and sold is at or above the represented value of energy efficiency (e.g., the efficiency set forth in a certification of compliance or on a label). The proposed rule, however, takes a slightly different approach than is used in the appliance program, at 10 CFR 430.24, for calculating an "adjusted lower 90 percent confidence limit." Under § 430.24, a single factor is specified for each product, and the "adjusted confidence limit" for each basic model of that product is calculated by dividing the lower confidence limit for all units of that basic model by the specified factor. Under the proposed rule, by contrast, the divisor is a factor that relates to the efficiency level of the particular motor being analyzed. As with the sampling plans for consumer appliances, this factor and other elements of the statistical sampling plan

for electric motors are intended to reasonably reflect variations in materials, and in the manufacturing and testing processes.

NEMA has recommended that the confidence limit constraint for representations of motor efficiency be the lower 90 percent confidence limit of the true mean divided by 0.95. (NEMA, No. 9 at B.2.). It appears that NEMA is proposing the same methodology used in the appliance program to account for measurement uncertainties and product variability. The Department agrees with the apparent intent of the NEMA recommendation, as well as its goal that, “. . . the confidence limit [of the represented energy efficiency] should be chosen so that it is consistent with MGI's tolerance factor for losses.” However, the Department believes that the method NEMA puts forth does not best achieve these objectives.

Electric motors differ substantially from the products covered under part 430. For each of 113 ratings of electric motor, EPCA specifies a minimum nominal efficiency. By contrast, under Part 430 minimum efficiencies are set forth at most for 16 different types of a product (in the case of direct heating equipment), and for most covered products efficiencies are specified for two to five types of the product. 10 CFR § 430.32. For central air conditioners, which NEMA cites as an example in support of its confidence limit methodology, energy conservation standards are specified for only two types of the product: the Seasonal Energy Efficiency Ratio (SEER) must be equal to or greater than 10 for split systems and 9.7 for single package systems. The Air-Conditioning and Refrigeration Institute (ARI), which in some respects functions for that industry as NEMA does for the motors industry, has prescribed performance criteria that these classes of central air conditioners must meet in order to use the ARI certification symbol and to be listed in the *ARI Directory of Certified Unitary Air-Conditioner Equipment*. Specifically, the SEER determined by laboratory testing may not be less than .95 of the SEER represented by the manufacturer. Thus, in specifying a divisor of .95 for central air conditioners, part 430 conforms with industry guidelines regarding measurement uncertainties and product variability for that product.

For electric motors, NEMA uses a maximum 20 percent loss difference to establish the minimum efficiencies that are associated with the standard nominal efficiencies. See MG1-1993, Table 12.8. This 20 percent loss tolerance is the motor industry's

benchmark for taking into account measurement uncertainty and product variability. It is a constant fraction of the total percentage of energy losses. Thus, because the percentage of energy losses decreases as efficiency increases, it appears that the percentage of losses allowable as a tolerance also decreases with increasing efficiency. This would mean, for example, that the measurement uncertainty and product variability for a motor with a nominal full load efficiency of 95 percent may be expected to differ substantially from those for a motor with a nominal full load efficiency of 75.5 percent.

The Department believes that the use of a single factor for all motors covered under part 431, as proposed by NEMA, does not adequately differentiate among the levels of efficiency established by the Act. The Department proposes, therefore, to establish coefficients, based on the NEMA MG1 minimum efficiency standards, for each nominal full load efficiency established by the Act and to include these in tabular form in new part 431.

In incorporating this method, it should be noted that the proposed part 431 would not set or enforce minimum energy efficiency standards. Since a unit or units of a basic model could fall below the NEMA minimum efficiency during efficiency testing and the basic model could still be found to meet with the represented energy efficiency, no minimum efficiency is set or enforced. Rather, the NEMA minimum efficiencies are used to provide a reasonable estimate of the measurement uncertainties and product variabilities that are likely to be encountered during actual testing.

The proposed 90 percent confidence limit was recommended by NEMA, and appears to the Department to be appropriate for electric motors. As just discussed, however, the divisor proposed by the Department differs from that proposed by NEMA. The Department specifically seeks comment on both of these proposals, including its proposed table of divisor coefficients, and on whether alternatives will better serve the objectives of providing both reasonable assurance that test results will apply to all units of a basic model, and reasonable allowance for product variability and measurement uncertainty.

In sum, the Department proposes that when an electric motor is subjected to actual testing to determine whether it complies with EPCA's efficiency standards, a sample shall be selected and tested comprised of units which are production units, or representative of production units, of the basic model

being tested. The sample must be of sufficient size, selected at random, and tested in accordance with the DOE test procedures adopted pursuant to section 343 of EPCA, 42 U.S.C. 6314. The test sample results would have to be within prescribed confidence limits.

The Department also proposes to permit manufacturers of electric motors to determine motor efficiency through predictive mathematical calculations developed from engineering analyses of design data and substantiated by actual test data. This would be similar to the approach found at 10 CFR part 430, § 430.24(m)(2)(ii), which permits manufacturers of central air conditioners to use “alternative rating methods.” Statements from Reliance and NEMA support the use of such alternative efficiency determination methods. They assert it would be prohibitively expensive and time consuming to test all the many basic models that manufacturers produce. In addition, the Department understands that the manufacturers and independent testing laboratories do not have sufficient resources to test so many basic models. NEMA advocates use of “alternative correlation methods” (synonymous with the Department's term “alternative efficiency determination methods”) that are based on engineering or statistical analyses, computer simulation, mathematical modeling, or other analytical evaluation of performance data. Furthermore, NEMA proposes using actual testing to substantiate such alternative methods.

According to NEMA, “A manufacturer must substantiate an alternative correlation method by actual testing of at least five basic models, using DOE-prescribed test procedures. Substantiation would require testing that demonstrates that predicted total power losses of a basic model design are within plus or minus ten (10) percent of the mean actual total power losses for the sample of each of the basic models tested.” NEMA further states that manufacturers would be required to test “two among the five basic models with the highest unit-volume of production and that at least two [of the five] models have predicted total losses which differ by at least 20 percent. Each of the five basic models should be of a different rating.”

“In lieu of advance approval, each manufacturer would be required to notify DOE of its use of alternative correlation methods in its compliance certification. Each manufacturer would stand ready to submit its alternative correlation test results (and underlying models and simulations) to DOE for review.” (NEMA, No. 9 at B.3.).

Based on the information discussed above, the Department agrees that it would be very difficult, if not impossible, for each manufacturer to do actual testing, to determine energy efficiency, for each basic model of motor it manufactures. The Department proposes to adopt procedures whereby a manufacturer would certify compliance for basic models through an alternative efficiency determination method (AEDM). The Department's proposal largely incorporates the criteria and procedures suggested by NEMA for use of such alternative methods. For example, a manufacturer would be required to do actual testing of at least five basic models.

The models selected for testing should be selected at random, subject to the following selection criteria: Two of the basic models tested would be required to be among the five basic models with the highest unit volumes of production by the manufacturer. Within any limitation imposed by that criterion, the basic models tested should be of different horsepower without duplication. The next priority would be to select basic models of different frame sizes without duplication. And finally, to the extent possible, each basic model selected should have the lowest full load efficiency among the basic models with the same rating.

A manufacturer could use only AEDMs that it had substantiated. Prior to using the AEDM, the manufacturer would be required to apply it to at least five motors on which the manufacturer had performed actual tests in accordance with DOE test procedures. The AEDM would be "substantiated," and could be used by the manufacturer, only if, for each of the tested basic models to which it was applied, the predicted total power losses upon application of the AEDM are within plus or minus ten percent of the total power losses that were measured for that basic model during the actual testing. ("Total power loss" here refers not to the arithmetic total of the losses for all of the units tested, but rather to average total losses for the tested units.)

The Department believes that the foregoing approach to permitting use of AEDMs for motors would ensure compliance with EPCA, while avoiding imposition of an undue burden on the industry.

D. Energy Efficiency Standards

EPCA prescribes standards for electric motors that are 1 through 200 horsepower, and manufactured "alone or as a component of another piece of equipment," except for "definite purpose motors, special purpose motors,

and those motors exempted by the Secretary." EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1). The Department proposes to incorporate these standards into 10 CFR part 431.

1. Standards for Metric Motors

As discussed above, a table in IEC 72-1 matches each standard kilowatt rating to the equivalent standard horsepower rating. Section 342(b)(1) of EPCA, 42 U.S.C. 6313(b)(1), specifies efficiency standards for many of these standard horsepower ratings. The matching kilowatt and horsepower values in IEC 72-1 are not exact conversion values, but in each instance are virtually equal. The Department proposes in § 431.42, to utilize the horsepower to standard kilowatt equivalents prescribed in IEC 72-1 in order to determine the required energy efficiency of a covered motor when such motor is rated in kilowatts.

Wisconsin Electric Power Company asserts that "the kilowatt ratings established by international standards (cf IEC 34) are based on a different numerical progression than the NEMA horsepower ratings standard in the United States. Thus, there is no true 'equivalence' between those NEMA horsepower ratings and corresponding kilowatt values." (WE, No. 2 at 3a 1).

The Department agrees that such IEC motors are manufactured according to a standard series of kilowatt output ratings that do not mathematically synchronize exactly with the North American standard series of horsepower output ratings. When the standard IEC kilowatt ratings are directly converted into horsepower using the formula, 1 kilowatt = (1/0.746) horsepower, the standard IEC ratings fall between the standard horsepower ratings specified in EPCA section 342(b)(1), although they are very close to the standard horsepower ratings.

ACEEE states that a metric rated motor should be required to meet the efficiency rating for its corresponding equivalent horsepower rating, or the next-highest efficiency rating. (ACEEE, No. 7 at 3.a.1). The Department agrees with ACEEE to the extent that a motor rated in kilowatts should meet the same nominal full load energy efficiency as an equivalent motor rated in horsepower.

Reliance advocates use of "the primary series of standardized IEC kW ["kilowatt"] equivalents to the hp ["horsepower"] ratings given in IEC Standard 72-1, Clause D.5.1 when referring to the values of horsepower specified in the Act. These equivalents are:

Horsepower	Kilowatts
1	.75
1.5	1.1
2	1.5
3	2.2
5	3.7
7.5	5.5
10	7.5
15	11
20	15
25	18.5
30	22
40	30
50	37
60	45
75	55
100	75
125	90
150	110
200	150

"While the above suggestion should include the majority of motors rated in kilowatt, it is possible for motors to be rated in kilowatt values other than those indicated based on a secondary series of standardized kilowatt ratings given in IEC Standard 72-1."

"The metric equivalent kilowatt ratings could then be incorporated by a definition that the table of efficiency values also apply to the exact kilowatt equivalent rating to each reference horsepower rating by the relationship that 1 horsepower is equal to .746 kilowatts. For reference this conversion would give the following results:

Horsepower	Kilowatts
1	.746
1.5	1.12
2	1.49
3	2.24
5	3.73
7.5	5.60
10	7.46
15	11.2
20	14.9
25	18.7
30	22.4
40	29.8
50	37.3
60	44.8
75	56.0
100	74.6
125	93.3
150	112
200	149

An advantage of using the first set of kilowatt versus horsepower relationship values based on recommended kilowatt ratings in IEC Standard 72-1 would be the convenience of easily identifying standard kilowatt rated motors in the resulting table to find the required efficiency value rather than having to locate every standard kilowatt rating between two values of the exact kilowatt equivalents." (Reliance, No. 8 at 3.a.1).

“NEMA recommends that the IEC standard kilowatt equivalents be used for specifying efficiency standards, rather than an exact metric conversion from round-number English measurements to fractional metric measurements. Metric-denominated general purpose motors are generally manufactured with standard kilowatt ratings, which should provide the basis for classification of motors and the specification of class-specific energy efficiency standards.” (NEMA, No. 9 at A.2.).

The Department agrees with NEMA and Reliance, and believes that kilowatt to horsepower equivalency could be addressed without confusion by utilizing the series of standardized equivalents given in IEC Standard 72-1, annex D.5., *Preferred rated output values*. The Department proposes, at 10 CFR 431.42, that the efficiency standard applicable to a standard horsepower rating as specified in section 342(b)(1) of EPCA, 42 U.S.C. § 6313(b)(1), applies to the corresponding standard kilowatt equivalent rating.

2. Standards for Horsepowers Not Listed in Statute, and for Non-standard Kilowatt Ratings

EPCA specifies efficiency standards only for electric motors with 19 specific horsepower ratings, all of which fall within the range of 1 through 200 horsepower. EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1). NEMA asserts that efficiency standards should apply to all “electric motors” motors that have ratings from 1 through 200 horsepower (or standard kilowatt equivalents). According to NEMA, a motor with a rating between two of the horsepower ratings specified in EPCA section 342(b)(1), or between two of the ratings specified in standard kilowatt equivalents, should be required to meet the efficiency standard set forth for the next highest horsepower (or kilowatt) rating specified in the statutory table. NEMA states that this would prevent circumvention of statutory efficiency requirements by designating a horsepower rating that is fractionally different from the standard ratings in the statute. (NEMA, No. 9 at A.1.).

The Department understands that the statute’s table of motor horsepowers is based on the preferred or standardized horsepower ratings established at NEMA Standards Publication MG1-1993, paragraph 10.32.4, *Polyphase Medium Induction Motors*. NEMA recognizes that it is not practical to build motors of all horsepower ratings for all of the standard voltages (cite NEMA MG1-1993, paragraph 10.30 NOTE). However, an “electric motor”

could be built and, for example, rated 35 horsepower, or 90 horsepower, or 175 horsepower, and so forth.

The Department agrees with NEMA that efficiency standards apply to all electric motors that have ratings from 1 through 200 horsepower (or standard kilowatt equivalents), including motors with a rating between two of the horsepower ratings specified in section 342(b)(1) of EPCA. The Department disagrees, however, that a motor with a rating between two of the horsepower ratings specified in section 342(b)(1) of EPCA, or between two of the ratings specified in a standard kilowatt equivalent table, should be treated as having the horsepower (or kilowatt) rating equal to the next highest rating specified in the statutory table (or standard kilowatt equivalent table) for purposes of determining the efficiency standard applicable to such motor.

Applying NEMA’s position to a hypothetical situation, a 32 horsepower electric motor would be required to meet the energy efficiency level prescribed for a 40 horsepower motor. To meet that energy efficiency level could require significant changes in design of the 32 horsepower motor, including the addition of electrical steel and copper, which in turn could result in changes to the motor’s physical dimensions to such a degree that it would no longer fit its normal applications. Rounding up presents a particular problem with respect to IEC motors, because they are generally smaller or more compact than the NEMA “T” frame sizes. Rounding up would make it very difficult for some sizes of motors to meet the statutory energy efficiency levels. Thus, the practice of rounding up could have the effect of banning or limiting the use of certain motors, because motors that meet the next higher energy efficiency level may be physically larger and may not fit into machines or packages which have been designed for more compact motors. The Department believes that use of such a rounding up procedure could result in an undue burden on manufacturers.

Other interpolative methods could include a sliding scale of energy efficiencies that correspond to intermediate horsepowers, or arbitrarily rounding down to the next lower horsepower. The Department believes neither method is sound. The sliding scale approach implies a degree of accuracy in achieving and measuring motor efficiency, and significant differences in the required efficiency levels between different horsepowers, that do not exist. In addition, EPCA’s efficiency standards for motors, EPCA

section 342(b)(1), 42 U.S.C. 6313(b)(1), are nominal full load efficiencies taken from a table of standardized values in MG1-1987, and standardized values would not be available to be the efficiency standards for intermediate horsepower motors. In addition, EPCA section 342(b)(1) prescribes, for example, identical efficiency levels for certain 40 and 50 horsepower motors, and levels that differ by only .6 for 30 and 40 horsepower motors. As to rounding a horsepower down to the next lower horsepower, that approach could encourage production of less efficient motors and thus conflict with EPCA’s purpose to save energy. It would create an incentive to manufacture motors with horsepowers just below the horsepower levels at which efficiency levels are specified in the Act, so that the motors would then be required to comply with the efficiency standard prescribed for the lower level.

The Department proposes to utilize simple mathematical rules of rounding to determine the required energy efficiency of a motor whose horsepower (or equivalent kilowatt) rating is between two of the ratings specified in EPCA section 342(b)(1). Horsepower values that fall at or above the midpoint between two horsepower ratings specified in EPCA section 342(b)(1) should be rounded up to the next higher specified horsepower rating to determine the required energy efficiency. Horsepower values that fall below the midpoint between two specified horsepower ratings should be rounded down to the next lower specified horsepower rating to determine the required energy efficiency. Motor kilowatt ratings that fall between standard kilowatt equivalents would be arithmetically converted directly into horsepower using the formula: 1 kilowatt = (1/0.746) horsepower. (In making such arithmetic conversions, no rounding would be permitted.) Resultant horsepower values would then be rounded using the rules of rounding just described, to determine the next higher or lower statutory horsepower and corresponding energy efficiency. The Department believes such procedures are appropriate to the design and application considerations of energy efficient motors, and would tend to cluster a family of motor horsepowers (or kilowatt ratings) and corresponding energy efficiencies around the family of applications for which the motors are designed without undue burden to the manufacturer. Nevertheless, in light of NEMA’s advocacy of the “rounding up” procedure, the Department specifically seeks further comments on its rounding

proposal and will consider alternative approaches.

3. Electric Motors as Components of Systems

The question of how this regulation would affect motors that are components of other equipment that is also covered under the Act is raised by the Air-Conditioning & Refrigeration Institute (ARI). ARI believes that the standards for electric motors at section 342(b) of EPCA should not apply to motors used as components in commercial air-conditioners, for example, because such air-conditioners are already covered by efficiency standards at section 342(a) of EPCA. ARI interprets section 342(a) of EPCA to mean that standards established for a system should take precedence over standards established for a component of that system. Further, ARI expresses concern that frequent changes in standards could lead to premature redesigns of equipment. (ARI, No. 3).

The Department understands that air-conditioning equipment components, such as the compressor, the condenser, and the motor, must be designed and built to function integrally with each other in order to meet overall system efficiency requirements. Nevertheless, section 342(b)(1) of EPCA explicitly imposes efficiency standards for "each electric motor manufactured (*alone or as a component of another piece of equipment*)." (Emphasis added.) Thus, every "electric motor" that is manufactured must meet the standards imposed by section 342(b)(1) of EPCA, regardless of whether it is manufactured "alone," and then inserted into another piece of equipment, or manufactured "as a component of another piece of equipment." The Department finds no language in the requirements for system efficiency at section 342(a) that explicitly or implicitly renders the efficiency standards in section 342(b)(1) inapplicable to motors used in air conditioning or other equipment covered by section 342(a).

Section 342(b)(1) sharply contrasts in this respect with section 346(b)(3) of EPCA. EPCA authorizes, but does not require, efficiency standards for "small electric motors." Section 346(b)(3) states that such standards "shall not apply to any small electric motor which is a component of" another product or piece of equipment to which standards apply.

In summary, contrary to ARI's position, EPCA cannot be construed so that the efficiency standards for electric motors do not apply to such motors when used in air conditioners also covered by standards. The Department is sympathetic to ARI's concern about

the possibility that manufacturers might have to increase the frequency with which they modify the air conditioning equipment they manufacture to accommodate new motors that have been re-designed to comply with efficiency standards for motors and to comply with standards applicable to the equipment itself. But this concern cannot be addressed by the creation of an unauthorized exemption from the statutory standards for electric motors.

E. Labeling

1. Statutory Provisions

Under section 344(a) of EPCA, 42 U.S.C. 6315(a), if the Department has adopted test procedures for a type of "covered equipment," such as motors, it must prescribe a labeling rule for that equipment. Section 344(b) provides that such rule must require disclosure of the motor's energy efficiency, and may require disclosure of estimated operating cost and energy use, determined in accordance with the test procedures. Section 344(c) authorizes inclusion in the rule of additional requirements "likely to assist purchasers in making purchasing decisions." Statutory examples of such additional requirements concern display of the label, providing information as to energy consumption, and disclosing in printed matter efficiency information required to be on labels.

Section 344(d) of EPCA, 42 U.S.C. 6315(d), requires that within 12 months of establishing test procedures, "the Secretary shall prescribe labeling rules . . . applicable to electric motors taking into consideration NEMA Standards Publication MG1-1987." Such rules shall require that electric motors be labeled to: "(1) Indicate the energy efficiency of the motor on the permanent nameplate attached to such motor; (2) prominently display the energy efficiency of the motor in equipment catalogs and other material used to market the equipment; and (3) include such other markings as the Secretary determines necessary, solely to facilitate enforcement of the standards established for electric motors under section 342."

All of the foregoing provisions are subject to section 344(h) of EPCA, 42 U.S.C. 6315(h), which states in essence that no labeling rule shall be promulgated for a type of covered equipment unless: (1) Such labeling is technologically and economically feasible with respect to such class; (2) significant energy savings will likely result from the labeling; and (3) the labeling is likely to assist consumers in making purchasing decisions.

2. Information on Motor Nameplate

Nominal full load efficiency. The Department understands that current, typical industry practice is to mark on each motor nameplate the motor's nominal full load efficiency, which is a value selected from the standardized values in NEMA MG1-1993, Table 12-8, column A. To determine the nominal full load efficiency for a particular motor, the manufacturer first determines the average efficiency of the motors it produces of that same design. It then selects from Table 12-8, Column A, the standardized value that is the closest lower value to, or that equals, such average efficiency figure. Each of the required efficiency values in section 342(b)(1) of EPCA is identical to one of these standardized values.

The Department proposes that each motor nameplate include a standardized value contained in Table 12-8. The manufacturer would determine the average efficiency for a basic model of motor through actual testing or application of an AEDM, as required under DOE test procedure regulations, would select the nominal efficiency for each motor in the same manner currently used by the industry, and would place that value on the nameplate.

This approach would satisfy the statutory requirements that the label of each electric motor disclose "the energy efficiency" of such motor, "determined in accordance with test procedures" promulgated under EPCA. EPCA sections 344 (b) and (d)(1), 42 U.S.C. 6315 (b) and (d)(1). Although the efficiencies stated on the labels would be standardized values, and often would not match precisely the test procedure results for the type of motor being labeled, the intervals between standardized values are small, and differences among efficiency values within a given interval are not significant. The Department believes, therefore, that such standardized values would accurately represent both the energy efficiency of a given motor, and the differences in efficiency among motors. The Act also requires the Secretary to consider NEMA Standards Publication MG1-1987 in prescribing labeling rules for electric motors. EPCA section 344(d), 42 U.S.C. 6315(d). This requirement would be met because the Department proposes to use the approach and the standardized values in NEMA MG1-1993, which, as relevant here, are identical to those in NEMA MG1-1987.

Because the proposed labeling requirement adopts current industry practice, the Department concludes that

such labeling would be technically feasible and economically justified. The Department also believes that such labeling would be likely to assist consumers in making purchasing decisions by distinguishing motors of greater and lesser efficiency, enabling consumers to make comparisons among competing manufacturers and to confirm their selection upon delivery, all of which can lead to significant energy savings. As suggested by NEMA, the information in the proposed efficiency label would describe the motor as manufactured.

Manufacturer number and "ee" logo. NEMA and Reliance recommend that, to identify motors that comply with EPCA, the nameplate also be required to include an encircled "ee," or other logo, and an identification number supplied by DOE upon receipt of the manufacturer's compliance certification. (NEMA, No. 9 at C.; Reliance, No. 8 at 3.c.) ACEEE and UL support use of the logo, but do not address requirement of an identification number. (UL, No. 4 at Labeling; ACEEE, No. 7 at 3.c.) The Department proposes to require that the nameplate of every motor that has been certified as complying with EPCA include a manufacturer compliance certification number, essentially as recommended by NEMA and Reliance, and to permit but not require nameplates of complying motors to include an "ee" logo.

With respect to the required identification number, the Department contemplates that it would issue an identification number to each motor manufacturer upon determining that the manufacturer had certified, in a form that satisfies the regulations, that its motors comply with EPCA. The manufacturer would then be required, within 90 days or upon the effective date of the labeling regulations, whichever is later, to include the number on its motor nameplates. The proposal also makes provision for including the number on motors certified subsequent to a manufacturer's initial certification.

The Department believes that such a number is necessary to help enforce the efficiency standards. Reliance asserts that requiring the number on a motor would discourage a manufacturer from attaching an "ee" mark to a non-complying motor. (Reliance, No. 8 at 3.c.) DOE agrees. In addition, requirement of the ID number would discourage manufacture of non-complying motors. For example, a manufacturer or distributor would not be allowed to ship covered motors into or within the United States unless the nameplate contains such an

identification number. (The identification number would not be required when a covered motor is exported from the United States.) Moreover, use of a fraudulent number on a non-complying motor could easily be traced, since only DOE would issue the numbers and each manufacturer would have a unique number.

Based on the statements of support by NEMA and Reliance, the Department concludes that such an identification number would be technologically feasible and economically justified. Energy savings would likely occur as a result of deterring the manufacture and shipment of covered motors that are not in compliance with the statute, and of facilitating identification of any non-complying motors sold in violation of the statute. Moreover, as NEMA points out, covered motors are sold almost entirely to highly sophisticated purchasers. These purchasers would be aware that the identification number connotes that the motor has been certified as complying with EPCA's efficiency standards. Thus, the number would aid consumers in making purchasing decisions, by calling attention to motors for which required certification have been submitted.

The Department is concerned, however, about possible abuse of the manufacturer's identification number. An unscrupulous manufacturer could certify one or a few motors as being in compliance, obtain a number from DOE, and then use that number on the nameplate of motors for which it did not properly certify compliance. In such an instance, the number would provide a misleading indication of compliance. Moreover, even absent a requirement that each motor bear an ID number, an inquiry to the Department could easily determine whether a particular manufacturer had certified a given motor. The Department seeks comment on the validity of such concerns, and on whether they outweigh the value of requiring the number on the motor nameplate.

As to inclusion of the "ee" logo or similar designation on the nameplate of a motor that complies with EPCA, there are considerations militating for and against such a requirement. On the one hand, as stated above, the purchasers of covered motors are almost entirely industrial and commercial consumers who are sophisticated purchasers and highly aware of energy efficiency concerns. The benefit to them of an "ee" logo seems limited, since they will be aware that general purpose motors must comply with EPCA's efficiency standards. On the other hand, the "ee" logo would distinguish such motors

from definite and special purpose motors that need not and do not comply, its voluntary use on non-covered motors could encourage their compliance with efficiency standards, and both the motor industry and energy efficiency advocates support use of the logo.

The Department is also concerned that inclusion of the "ee" logo on motors that comply with EPCA's nominal full load efficiency standards might be misleading. Under NEMA MG1-1993, to be classified as "energy efficient" a motor must meet both a nominal efficiency identical to the efficiency level required by EPCA, and the applicable minimum efficiency prescribed by Table 12-10 of NEMA MG1-1993. NEMA MG1-1987 had a similar requirement. Given the practice under NEMA MG1, if the Department were to require or permit the "ee" logo on motors based solely on their meeting only the EPCA standards, purchasers might assume that such motors necessarily meet corresponding minimums for energy efficiency even though EPCA does not require motors to meet such minimums.

One way to avoid such confusion would be for the Department to require that a motor labeled with the "ee" logo, or as "energy efficient," meet the minimum efficiency associated with its nominal efficiency. Another possibility would be to follow ACEEE's recommendation that, in addition to nominal efficiency, minimum efficiency be required on the motor nameplate, in catalogs, and in other marketing materials (ACEEE, No. 7 at 3.c.) NEMA, however, opposes any requirement that nameplates or promotional materials disclose a motor's minimum efficiency. (NEMA, No. 9 at C.)

Clearly, to mark the minimum efficiency on a motor nameplate, and in marketing materials, would provide a more complete picture of the energy efficiency characteristics of that motor. EPCA, however, prescribes standards for a motor's "nominal full load efficiency." EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1). As explained above, the nominal efficiency is based on the average efficiency for that type of motor. The term "nominal full load efficiency" neither implies nor subsumes a minimum efficiency level; nor do EPCA's standards explicitly state that a motor must have a minimum efficiency. Thus, because motors can, in theory, comply with EPCA without meeting minimum efficiency levels, the Department does not believe it can *require* such levels to be met or be displayed on labels or in marketing materials.

Nevertheless, it is the Department's understanding that, as a practical matter, it would be very unlikely that a manufacturer could meet EPCA's nominal efficiency standard for a motor if it produces some motors of that design with efficiencies below the corresponding minimum in Table 12-10 of NEMA MG1-1993. Moreover, DOE understands that the provisions of NEMA MG1 will continue to exist and be in force alongside EPCA, and the Department has received no indication that NEMA MG1 will be modified to eliminate the requirement that each motor have a nominal efficiency as well as an associated minimum. Thus, DOE assumes that, independent of DOE requirements under EPCA, under NEMA MG1-1993 a motor could not be labeled as "energy efficient" or have an "ee" logo or other similar designation, unless it meets both the applicable nominal efficiency specified in Table 12-10 of MG1-1993 (which would be the same as the applicable EPCA standard), as well as the associated minimum efficiency specified in Table 12-10. In effect, therefore, motors complying with EPCA standards can be expected to have an appropriate minimum efficiency.

Based on these understandings, the Department proposes that manufacturers be *permitted* to label covered motors as "energy efficient," or with the "ee" logo, or with some comparable designation or logo, when a motor meets the applicable nominal full load efficiency standard in section 342(b)(1) of EPCA. The Department assumes that this would, in effect, authorize manufacturers to continue to follow the industry practice of classifying a motor as "energy efficient" only when it meets both the applicable nominal and the applicable minimum efficiency level prescribed in Table 12-10 of MG1-1993 with Revision 1. The Department sees considerable merit in such an approach, which might also partially satisfy ACEEE's concern about including minimum efficiency levels in labels. Moreover, the fact that industry is following this approach indicates that it is technologically and economically feasible. This proposal, if adopted, would not *require* a manufacturer to include an "ee" or "energy efficient" designation on its nameplates. A manufacturer that made a complying motor would be free not to place an "ee" logo or similar designation on its motor nameplates.

The Department continues to consider the option, however, of requiring that a manufacturer, in conjunction with using a label with the "ee" logo or "energy efficient" designation, display the minimum efficiency of the motor on the

motor nameplate, and/or include such minimum efficiency in its compliance certification. The Department solicits comments on these approaches.

Finally, presumably anticipating required use of the "ee" logo, Reliance recommends that the Department consider recognizing marks of energy efficiency from other countries when such marks are equivalent to the mark required by the Department. (Reliance, No. 8 at 3.c.) As discussed below, the Department does not propose to require the use of any such mark. But in light of the National Voluntary Laboratory Accreditation Program discussed below, the Department understands the principle advanced by Reliance of mutual recognition between the U.S. and other countries. The Department contemplates that its proposal permitting use of the "ee" logo or other "energy efficiency" designation would permit use of the energy efficiency mark from another country. In other words, where a motor meets the requirements for use of the "ee" or other "energy efficiency" designation, it can display a foreign energy efficiency mark.

3. Disclosure of Efficiency Information in Marketing Materials.

EPCA directs the Secretary to require that the energy efficiency of each electric motor be "prominently" displayed "in equipment catalogs and other material used to market the equipment." EPCA section 344(d)(2), 42 U.S.C. 6315(d)(2). To implement this provision, the Department proposes to require that catalogs and other marketing materials for a motor prominently display the same nominal full load efficiency rating that must appear on the motor's label. Further authority for such a requirement is provided by section 344(c)(3) of EPCA, which authorizes adoption of requirements "likely to assist purchasers in making purchasing decisions," including required disclosure in "printed matter which is displayed or distributed at the point of sale" of the motor of efficiency information required to be on the label of the motor. The Department also proposes (1) To require that catalogs and other marketing materials for a complying motor display the manufacturer number required to be placed on the label of such motor, and (2) that the provisions concerning inclusion on a label of the "ee" logo, the "energy efficiency" designation, or other similar logo or designation, also apply to printed materials.

NEMA asserts that Congress intended the labeling rules for electric motors to "facilitate enforcement of the efficiency

standards," not to educate consumers. The language of the Act does not support this claim. Section 344(d) of EPCA, after directing the Secretary to promulgate requirements for disclosure of a motor's energy efficiency, directs that "such other markings" shall be required "as the Secretary determines necessary, solely to facilitate enforcement of the standards established for electric motors." The "facilitate enforcement" criterion applies only to "such other markings" required by the Secretary. It does not apply either to section 344(d)'s specific requirements concerning disclosure of a motor's efficiency, or to its general directive to "prescribe labeling rules . . . applicable to electric motors." Furthermore, section 344(c) lists examples of labeling requirements that are authorized for "covered equipment," including motors, clearly stating in language that precedes such requirements that they should be "likely to assist purchasers in making purchasing decisions." In summary, the "facilitate enforcement" language quoted by NEMA governs neither most of the labeling provisions applicable to motors specifically, nor any of the labeling provisions in sections 344 (a)-(c) that are generally applicable both to motors and to other covered equipment.

The Department believes that the nominal full load efficiency and the manufacturer's number "prominently displayed" in catalogs and other marketing material would likely assist even knowledgeable purchasers by clearly identifying an electric motor that is in compliance with the EPCA. Reliance Electric expresses concern that inclusion of such markings in catalogs could be unduly burdensome, given the length of time it takes to update catalog information to include new or modified motors. The Department believes that this concern is addressed by the provisions of proposed § 431.122(a)(4), which provide in effect that the labeling provisions applicable to catalogs do not apply to catalogs distributed before the effective date of the labeling rule. In addition, under the proposed § 431.82(b)(1), the requirement that marketing material include information concerning a particular motor would apply only to the extent that the motor is mentioned in such material. Thus, for example, catalogs would have to be updated to include the nominal full load efficiency and the manufacturer's number applicable to a motor only when the catalog is revised to include that motor. This would be a technically feasible and economically justifiable means to satisfy the requirement in

section 344(d)(2) of EPCA to "prominently display the energy efficiency of the motor in equipment catalogs and other materials to market the equipment."

Both Reliance and NEMA assert that energy efficiency markings should be required on import documents to assist Customs officials with identifying motors that comply with EPCA. (Reliance, No. 8 at 3.c and NEMA, No. 9 at C). The Department understands that Customs inspectors may not be able to directly examine an imported motor that is packaged for shipping, or one that is a component in a larger piece of equipment. Therefore, the Department proposes that import documents for any covered electric motor disclose the date of the Compliance Certification and the DOE number for that motor, whether the motor is imported alone or as a component of another piece of equipment. The Department believes such identification information is consistent with requirements placed on U.S. manufacturers and would facilitate enforcement by Customs officials.

The Department does not propose to require that Customs documents include a motor's nominal full load efficiency. The Department has doubts about whether it will be practical for Customs officials to check during the import process on whether a motor complies the applicable minimum efficiency standard. The Department is still considering, however, whether such a requirement is warranted and requests comment on this point.

4. Other Matters

EPCA authorizes required displays of information about electric motor energy efficiency which are likely to assist purchasers in making purchasing decisions, including instructions for maintenance, use, or repair of the motor, and information on energy use. EPCA section 344(c), 42 U.S.C. 6315(c). Most commenters agree that displays of such information would often be impractical and should be optional, not required. (Nailen, No. 2 at 3c; UL, No. 4 at Labeling; ACEEE, No. 7 at 3.c; Reliance, No. 8 at 3.c; and NEMA, No. 9 at C). The Department has no information to the contrary, and therefore does not propose to require display of such information.

Baldor Electric Company ("Baldor") raises a concern about the need for performance warnings on motors that will comply with EPCA's efficiency standards, and about the potential waste of energy when such a motor is misapplied. Since these motors typically run faster, and might have less starting torque than less efficient motors, Baldor recommends that a

warning label be required on each covered motor to alert users to verify load requirements before installation, and to prevent possible misapplication and wasted energy. (Baldor, at 10).

The Department believes that Baldor's concerns have some merit, but do not warrant a labeling requirement. As to starting torque, EPCA does not require manufacturers to reduce starting torque to meet the required levels of efficiency. The Department understands that manufacturers are already offering for sale NEMA Design A and B motors that meet EPCA efficiency standards and that have the same starting torque capabilities as existing, less efficient NEMA Design A and B motors. In any event, the Department believes that any performance differences between covered motors that will comply with EPCA, and less efficient versions of such motors, are minor and will affect only a relatively small number of specific applications. Those situations would appear to be best addressed not by general labeling requirements, but rather by consultation between the motor user and seller during the process of selecting a motor, to assure that particular application requirements are satisfied by the performance capabilities of the motor purchased. DOE concludes that the addition of a warning label should be at the discretion of the manufacturer.

EPCA authorizes the Secretary to test the accuracy of information disclosed pursuant to labeling requirements for covered equipment. EPCA section 344(i), 42 U.S.C. 6315(i). NEMA recommends that DOE not exercise its authority to test the accuracy of the efficiency marked on a motor nameplate, so long as such marking is based on a substantiated alternative correlation method, or, apparently, on actual testing. NEMA suggests that any DOE enforcement testing be limited to auditing the substantiation of the alternative correlation method. (NEMA, No. 9 at C.).

The Department understands that the efficiency marked on the nameplate of a motor identifies the average efficiency of a population of motors, and may not be the exact efficiency of that particular motor. Therefore, parallel with provisions applicable in the appliance efficiency program, the enforcement provisions proposed here would require examination of a manufacturer's prior compliance determinations before enforcement testing may proceed, and any such testing would determine compliance through tests of a sample of units of the motor. Presumably, in some instances, examination of the prior compliance determinations would

obviate the need for further testing and establish the validity of the energy efficiency marked on a label. But the Department's proposal permits further testing, at its discretion, to determine the accuracy of a manufacturer's required information disclosures. The Department sees no basis for agreeing to relinquish or limit its authority under section 344(i) of EPCA to perform such further testing.

The Federal Trade Commission (FTC) regulates energy efficiency labeling for appliances, and the approach the Department proposes here is similar to that adopted by the FTC in 16 CFR 305.15(b) and 305.16. These provisions implement section 326(b)(3)(B) of EPCA, 42 U.S.C. 6296(b)(3)(B), which, in language similar to section 344(i), authorizes the FTC to test products to determine the accuracy of label information. As in the Department's proposal here, the FTC procedures require examination of a manufacturer's prior compliance determinations before enforcement testing may proceed. But the FTC has not relinquished its authority to conduct further testing that it deems appropriate.

NEMA also suggests that manufacturers be permitted to use the encircled "ee" logo for motors that meet EPCA efficiency standards, even if such motors are manufactured before the effective date of the standards, or are definite or special purpose motors. (NEMA, No. 9 at C.). The Department finds substantial merit in NEMA's proposal. The Department believes it is in the national interest to save energy both through regulatory programs and voluntary programs, and understands that the statute does not prohibit voluntary compliance. Therefore, the Department proposes that, where an electric motor is in compliance with the energy efficiency testing and standards requirements of the statute, even though it is not covered equipment, a manufacturer may voluntarily comply with the proposed labeling provisions. The manufacturer could comply with one or more of these provisions. It would have to meet the requirements of any provision that it purports to comply with, and it would be subject to enforcement action if it fails to meet such requirements. For example, if the label of a special purpose motor were to include the nominal full load efficiency of the motor, such efficiency rating would have to be derived in accordance with application of the DOE test procedures prescribed in § 431.82(a)(1)(i) of the proposed labeling rule.

F. Certification

1. Statutory Provisions

EPCA requires "manufacturers to certify, through an independent testing or certification program nationally recognized in the United States, that such motor meets the applicable [nominal full load efficiency standard]." EPCA section 345(c), 42 U.S.C. 6316(c). The Department understands the statutory language to provide manufacturers with two separate ways to fulfill the certification requirement: (1) Manufacturers may certify, through an independent testing program nationally recognized in the United States, that such motor meets the standards; or (2) manufacturers may certify, through an independent certification program nationally recognized in the United States, that such motor meets the standards. Section 345(c) does not specify what is meant by "independent testing," "certification program," or "nationally recognized." Moreover, little insight into the meaning of the latter two terms is provided by other provisions of EPCA or by operation of the consumer appliance energy efficiency program. The term "independent testing" also is not used elsewhere in the Act. EPCA requirements concerning test procedures, however, make clear that "testing" refers to tests of products (in this case motors) to determine whether they satisfy efficiency requirements. Such tests to certify compliance with EPCA's efficiency standards have commonly been performed in manufacturers' own facilities, and no other provision of EPCA or the DOE regulations calls for "independent" testing. By stating that a compliance certification based on testing shall be through an "independent testing" program, section 345(c) of EPCA appears to require a different approach. Given the normal meaning of "independent," section 345(c) may call for testing to be conducted at a facility not under the control of or affiliated with the manufacturer.

2. Basis for Certification

a. Independent Testing Program. The Department conducted an informal investigation and, in addition, solicited statements during the aforementioned public meeting held June 2, 1995, in order to understand the nature of "independent testing" and "certification" programs, and to learn what programs exist that manufacturers could use to certify compliance with the energy efficiency requirements of the statute. The question of who should conduct the required testing for the

program elicited considerable comment, especially concerning the adequacy of the number of independent testing facilities. Statements provided by Wisconsin Electric, Reliance, ACEEE, NEMA, Nielsen Engineering Inc., and UL indicate that only a few independent facilities in the United States and Canada have the capability to test motor efficiency as required by EPCA. According to Reliance, for example, the number of third party test facilities available in North America is so limited that reliance on such facilities to conduct an independent testing program would present a major roadblock to compliance certification by the electric motor industry. (Reliance, No. 8 at 3.d.2). ACEEE adds that it is unlikely that the number of independent test facilities could be rapidly increased, since there are very few experts familiar with the design of test facilities and the details of performing such tests. It would likely take ten years to construct the facilities, install the equipment, and train staff for the testing capacity necessary to independently certify all motor models covered by EPCA. (ACEEE letter to DOE, 11/20/95).

The Department understands there are considerable variations in the primary components of electric motors, which include the stator assembly; the rotor assembly; the enclosure, which includes bearings, a lubrication system and other mechanical or small electrical assemblies; and the shaft. Such variations are part of the means by which motors are classified. For example, the enclosure may be open or totally-enclosed; the motor may operate from an alternating current power supply at any one of several voltage levels; or the motor may operate at any one of several speeds. The number of different motor configurations increases rapidly due to the numerous combinations of other electrical and physical characteristics possible. These characteristics relate to method of starting, enclosure type, horsepower rating, speed, torque, voltage, and temperature rise. The list of such variations is significant. According to one DOE study,⁴ for example, considering only motors above 5 horsepower, there are approximately 5,300 different possible covered motors. The potential number of motors requiring testing, however, would be reduced under the statutory definition of "basic model." Even so, testimony from the June 2, 1995, public meeting and written statements from manufacturers and NEMA speak of

⁴ "Classification and Evaluation of Electric Motors and Pumps," DOE/TIC-11339, 9/80, sec. III.

different basic models still numbering in the thousands that are being manufactured and could potentially be required to undergo testing for efficiency. (Public Meeting, Tr. pgs. 33, 63, and 88;⁵ Reliance, No. 8 at 3.b.3; and NEMA, No. 9 at B.3.).

The foregoing indicates that only a small number of existing independent laboratories are capable of testing electric motors for energy efficiency, and that a very substantial volume of motors will require testing. Because of the insufficient testing capacity, the Department believes it will be impossible for all or most manufacturers to test their motors in test facilities other than their own laboratories. Thus, manufacturers would not be able to comply with a narrow reading of the "independent testing" aspect of the statute.

The Department believes that the goal and intent of this provision of the statute, however, is to provide assurance that test results are accurate, valid, and capable of being replicated. Tests must be performed, for example, with a degree of independence so that the results are not influenced by marketing and production concerns. The issue of how to assure that test results are comparable to those conducted in an independent testing laboratory is fundamental to this program. This question is addressed in many of the statements received as a result of the aforementioned informal investigation and the June 2, 1995, public meeting.

NEMA, for example, asserts that the statutory provision for "independent testing" must be interpreted in light of the reality that there is insufficient capacity in independent test laboratories. NEMA believes the only technically feasible and economically justifiable means to comply is by using manufacturers' own laboratories. (NEMA, No. 9 at D.2.). In its November 20, 1995, letter to the Department, ACEEE agrees with this position, adding that "the only way to make the required testing capacity available would be to accredit the testing facilities of motor manufacturers and allow them to certify the efficiency of motors." (ACEEE letter to DOE, 11/20/95).

Both Reliance and NEMA describe two possible options for programs which could fulfill the requirements of "independent testing": Testing performed at a third party independent accredited facility which has some type

⁵ "Public Meeting, Tr. pgs. 33, 63 and 88," refers to the page numbers of the transcript of the "Public Meeting on Energy Efficiency Standards, Test Procedures, Labeling and Certification Reporting for Certain Commercial and Industrial Electric Motors," held in Washington, DC, June 2, 1995.

of national recognition; or testing at an accredited manufacturer's facility that is considered independent under the requirements for accreditation. (Reliance, No. 8 at 3.d.2 and NEMA, No. 9 at D.2.). As mentioned above, manufacturers' laboratories have been widely used to test products for compliance with efficiency requirements imposed under section 325 of EPCA, 42 U.S.C. 6295. A laboratory accreditation program could also play a role for electric motors, provided the laboratory is accredited to test electric motors for energy efficiency according to the procedures in IEEE Standard 112 Test Method B and CSA Standard C390 Test Method 1.

b. Laboratory Accreditation. In researching how laboratory accreditation programs could satisfy the independent testing provision of the statute, the Department has reviewed a number of publications, directories, and programs.⁶ Such documents frame the qualities of a laboratory accreditation program, which include: Assessment criteria or procedures which determine, for example, the laboratory's independence within the manufacturer's organizational structure so that test results are not influenced by such factors as marketing and production sides; on-site inspection of the laboratories; qualification requirements for laboratory staff; requirements to ensure the identity and integrity of test samples; periodic re-audit of facilities; laboratory participation in a proficiency testing program; and requirements for the adequacy, maintenance, and calibration of equipment.

The ACEEE states that the Department should "facilitate the development of independent, accredited motor testing capability in the United States to allow for independent verification of manufacturer test results." According to ACEEE, such accreditation increases

⁶ *Laboratory Accreditation in the United States*, Maureen A. Breitenberg, May 1991, NISTIR 4576.

Director of State and Local Government Laboratory Accreditation/Designation Programs, Charles W. Hyer, Editor, July 1991, NIST Special Publication 815.

Directory of Professional/Trade Organization Laboratory Accreditation/Designation Programs, Charles W. Hyer, Editor, March 1992, NIST Special Publication 831.

Test laboratory accreditation criteria published in 15 CFR part 285.

National Voluntary Laboratory Accreditation Program Handbook 150, Procedures and General Requirements.

ISO/IEC Guide 25, General requirements for the competence of calibration and testing laboratories.

The Occupational Safety and Health Administration (OSHA) laboratory accreditation program conducted in accordance with 29 CFR 1910.7.

confidence in the validity of manufacturer test results, and provides an alternate means of testing for manufacturers who do not operate their own accredited test laboratory. (ACEEE, No. 7 at 3.d).

Statements received from ACEEE, the National Institute of Standards and Technology (NIST), Reliance, and NEMA support laboratory accreditation as a means to augment the number of existing independent laboratories in order to comply with the "independent testing" aspect of the statute, and recommend the NIST National Voluntary Laboratory Accreditation Program (NVLAP) as a source of accrediting laboratories to test motors for energy efficiency. (ACEEE, No. 7 at 3.d; NIST, No. 1; Reliance, No. 8 at 3.d.2; and NEMA, No. 9 at D.2.).

According to NIST, NVLAP is the only general accreditation program in the Federal system. It is a completely independent third party accreditation program that operates under the Procedures and Requirements published in 15 CFR part 285, and has mutual recognition agreements with national accreditation organizations in other countries, including Canada. Both the U.S. and Canada use one procedures handbook (the NIST Handbook 150-10, *Efficiency of Electric Motors*), and NVLAP's proficiency testing program. Under NIST Handbook 150-10, § 285.33(h)(1), laboratories are accredited to use both the IEEE 112 Test Method B, the motor efficiency test procedure prescribed by the Act, and CSA Standard C390 Test Method 1, which MG1-1993 incorporated as an alternative test procedure. (As discussed above, the Department proposes, in accordance with EPCA, to allow use of this alternative.) NIST adds that industry representatives support NVLAP and its mutual recognition agreements with other countries. (NIST, No. 1). ACEEE adds that it sees no problem with accepting test results from laboratories in Canada or other countries if the laboratories receive NVLAP accreditation or if accreditation from their national body is accepted by the NIST as meeting NVLAP standards. (ACEEE, No. 7 at 3.d).

Reliance notes that at present, NVLAP is the only accreditation program which has established a complete manual on the requirements for laboratory accreditation for determining the efficiency of electric motors. This accreditation program was created by NVLAP with the cooperation of motor manufacturers. Reliance points out, however, that since there are over 300 accrediting bodies in the United States, it is possible that several could conduct

a program to accredit laboratories for performing motor efficiency testing described in IEEE 112 or CSA C390. Reliance asserts that recognition of any test facility which has been accredited by a national accrediting body as an "independent test facility" should be considered, and that international standards provide a precedent for this. "To receive accreditation under international standards for laboratory accreditation a facility must meet certain requirements for classification as an independent facility, even if it is within the manufacturing complex for which it would be performing the product testing. To quote from Clause 4.2 of ISO/IEC Guide 25, *General requirements for the competence of calibration and testing laboratories*, '(b) the laboratory shall have arrangements to ensure that its personnel are free from any commercial, financial, and other pressures which might adversely affect the quality of their work and (c) be organized in such a way that confidence in its independence (emphasis added) of judgment and integrity is maintained at all times.' In short, accreditation to standards of recognized accreditation organizations is equivalent to a recognition of independence. This could provide the independence needed to meet the requirements of an independent testing or certification program." (Reliance, No. 8 at 3.d.2).

The Department recognizes the possibility that accreditation bodies other than NVLAP could accredit motor testing laboratories. For example, the American Association for Laboratory Accreditation (A2LA) is a nonprofit, scientific, membership organization dedicated to the formal recognition of testing laboratories and related organizations which have achieved a demonstrated level of competence. According to literature published by A2LA, accreditation is available to all laboratories regardless of whether they are owned by private companies or government bodies. One essential requirement, of course, is that laboratories be accredited competent to perform testing in accordance with the test procedures prescribed pursuant to EPCA for electric motors. A2LA accreditation can be obtained for all types of tests, measurements and observations that are reproducible, properly documented, and generally available to everyone. A2LA's general accreditation criteria are those of ISO/IEC Guide 25: 1990, *General requirements for the competence of calibration and testing laboratories*. Guide 25 is followed by NVLAP and other accrediting bodies.

c. Certification Program. EPCA also provides that a manufacturer can use a "certification program nationally recognized in the United States," instead of an independent testing program, to certify that its motors meet EPCA efficiency standards. EPCA section 345(c), 42 U.S.C. 6316(c). The Department understands the word "certification" to mean a procedure by which a third party gives written assurance that a product, process or service conforms to specified requirements.

With regard to the nature, identity, and capabilities of any nationally recognized program or programs for the certification of electric motors for energy efficiency, Reliance describes two existing certification programs in North America, one conducted by CSA, and the other by UL. Reliance states that both are generally regarded by industry as "nationally recognized." Reliance notes that these programs are in place now and are independently verifying motor efficiency. Reliance suggests that these programs could directly fulfill the requirements of EPCA without modification. Both programs entail (1) submittal by the manufacturer of the declared nominal efficiency of the motors to be certified at the time of application into the program, (2) examination of the manufacturer's testing facility to determine that it is competent in performing the test procedure in the IEEE 112 or CSA C390 Standards, (3) random selection by the certification agency of the ratings of some motors to be tested in the presence of an assessor from the certification agency, (4) testing of the selected motors in the manufacturer's test facility, (5) testing the same motors at an independent laboratory for comparison of the results of the two tests, and (6) yearly follow-up audits which include additional random sample testing to determine that the test facility maintains its ability to perform the test and that the manufacturer has not changed the motor design in any way that affects the efficiency. (Reliance, No. 8 at 3.d.2). Reliance adds that it is not necessary to limit independent certification to CSA or UL. What is necessary is that the certification program be conducted by an organization in which the consumer will have full faith and confidence.

UL asserts that the Act's requirements are met by its Energy Verification Service, wherein a motor manufacturer's production and testing operations are evaluated and representative samples are tested to applicable standards. Following initial verification, follow-up audits of products and on-going testing by the manufacturer is required.

Essentially the steps set forth in the above paragraph are followed. UL notes that its Energy Verification Service is in compliance with Federal law in Canada, and is accredited by the Standards Council of Canada. As an alternative to DOE developing criteria for the acceptance of testing laboratories and certification bodies, UL recommends that established ISO/IEC international criteria be utilized. (UL, No. 4 at Certification).

The UL statement then lists the following ISO/IEC international criteria applicable to testing laboratories and certification bodies: ISO/IEC Guide 25, *General requirements for the competence of calibration and testing laboratories*; 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*; ISO/IEC Guide 28, *General rules for a model third-party certification system for products*; and ISO/IEC Guide 40, *General requirements for the acceptance of certification bodies*.⁷ UL recommends that DOE use the criteria in the foregoing Guides as the basis for recognizing that a test laboratory or certification organization is competent to perform required tests or operate a certification program. The Department understands that these are internationally recognized documents utilized by testing laboratories, accreditation bodies, and certification bodies in the U.S.

d. National Recognition. Under EPCA, a testing or certification program used to certify compliance must be "nationally recognized." EPCA section 345(c), 42 U.S.C. 6316(c).

The question of national recognition has been addressed at 29 CFR part 1910, by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), which uses third-party (or independent) testing laboratories to ensure that certain equipment and materials are safe for workplace use. The OSHA final rule at 53 FR 12102-12125 (April 12, 1988) includes a requirement that testing laboratories listing or approving products or equipment required to be approved under Part 1910 be recognized as Nationally Recognized Testing Laboratories (NRTL) by OSHA. Under that rule, OSHA evaluates applicant testing and control programs against the NRTL definitional requirements, and

⁷ISO/IEC Guide 40 has been superseded by ISO/IEC 65-1996, *General requirements for bodies operating product certification systems*.

issues a written "recognition" letter. This is done in accordance with 29 CFR 1910.7 appendix A. OSHA also provides for continuing surveillance over OSHA-recognized NRTLs to assure conformance with the requirements of its rule. The definition of NRTL includes the following requirements:

- (1) Capability to examine specific equipment for workplace safety;
- (2) Provision of controls and services necessary for assuring and demonstrating original conformity of equipment to appropriate test standards;
- (3) Independence from manufacturers, suppliers and vendors of products, and from other employers; and
- (4) Procedures for producing creditable findings and reports and for handling complaints and disputes. (Department of Labor, No. 11).

The Association of Independent Scientific, Engineering and Testing Firms (formerly the American Council of Independent Laboratories (ACIL)) appears to claim that section 345(c) of EPCA, 42 U.S.C. 6316(c), does not allow a manufacturer to certify compliance with efficiency standards through testing in its own laboratory, even if the laboratory is accredited. ACIL asserts that section 345(c) must be interpreted consistently with sections 342(b) and 346(b)(3) of the statute, which refer to listing or certifying motors by a nationally recognized testing laboratory (NRTL). ACIL recommends that DOE reference the OSHA program to accredit such laboratories, and "codify reliance on these NRTLs to certify electric motors." (ACIL, No. 6). Although ACIL does not so state, the Department understands that these laboratories are independent, and not controlled by a manufacturer of the product being tested.

The Department cannot agree with ACIL's apparent view that, because manufacturers do not control the safety testing laboratories referred to in sections 342(b) and 346(b)(3) of EPCA, the efficiency testing programs required to be used under section 345(c) also must be free of manufacturer control. First, different considerations may apply to safety testing and to efficiency testing in determining the required degree of independence of a testing facility. Second, EPCA's references to safety testing laboratories are incidental to EPCA's efficiency requirements, and unrelated to the requirements of section 345(c). Those references provide little guidance in interpreting section 345(c). Finally, as discussed above, implementation of section 345(c) would be impossible if it were construed as prohibiting compliance certification

based on testing in manufacturers' own laboratories.

Substantial potential may exist for NRTLs to make future contributions to the EPCA program by performing energy efficiency testing. But contrary to ACIL's recommendation, the Department cannot yet rely on these laboratories to meet EPCA requirements, because it has no indication that they currently are qualified to do efficiency testing. And certainly the Department cannot rely on OSHA's NRTL recognition process. The references to test laboratories in sections 342(b) and 346(b)(3) of EPCA, as well as OSHA's accreditation of NRTLs, address safety testing. The procedures and equipment for efficiency testing are different from the procedures and equipment for testing whether a motor will operate safely.

The Department believes that the NRTL program does, however, provide an approach for determining when a program is "nationally recognized." As further discussed below, the Department proposes to adopt formal procedures similar to those utilized by the OSHA NRTL program for purposes of establishing when a certification program is "nationally recognized" within the meaning of section 345(c).

e. Proposal. The Department proposes that the statutory requirement for certification through an "independent testing program" be met by using a laboratory, operated by either a third party or a manufacturer, that has been accredited to perform the DOE test procedures. Given the paucity of test facilities not controlled by manufacturers, the Department believes that testing at manufacturers' laboratories that have been accredited would satisfy the intent of the "independent testing" aspect of EPCA section 345(c). Such accreditation would provide many of the protections as to accuracy, bias, and independence of judgment that would be provided by testing at non-manufacturer facilities. Accreditation would also give additional assurance that the laboratory is fully capable of testing a motor's energy efficiency, and would reduce concerns with respect to variability and repeatability of testing and test results. Accreditation of non-manufacturer laboratories is proposed to assure an equal degree of reliability with manufacturers' laboratories, and, as discussed below, to satisfy the section 345(c) requirement that testing programs be nationally recognized.

In accordance with section 345(c), the Department's proposed regulation also permits a manufacturer to certify compliance through an independent certification program. Such a program

would have to be essentially as described above by UL and Reliance. Manufacturers that elect to use a certification program would not be required to have their own laboratory accredited.

Finally, section 345(c) requires that compliance be certified through a testing or certification program that is "nationally recognized." The Department proposes that this requirement shall be met (1) by a testing facility that has been accredited either by NVLAP or by an accrediting body that DOE classifies as nationally recognized to accredit facilities to test motors for efficiency, or (2) by a certification program that DOE has classified as nationally recognized. The Department proposes criteria and procedures under which it would make such classifications. Included would be the application of appropriate ISO/IEC criteria. Accrediting bodies and certification programs would seek such classification by submitting a petition to the Department, accompanied by supporting documentation.

Under the Department's proposal, NVLAP accreditation of motor testing laboratories would be pursuant to NVLAP's existing approach to granting such accreditation, set forth in 15 CFR part 285 and NIST Handbook 150-10. The Department is reviewing, and requests comment on, whether these provisions are in any way inconsistent with EPCA requirements or any portion of the proposed part 431. The Department also proposes that if NVLAP alters its approach to accrediting motor testing laboratories, subsequent to DOE adoption of a final rule in this proceeding, such changes would become applicable to accreditation under part 431 only if approved by DOE. The Department seeks comment on whether such a provision is needed, and will suffice, to assure that NVLAP accreditation methods will continue to be consistent with the DOE energy efficiency program for motors.

In summary, the Department proposes implementation of the requirement for "manufacturers to certify, through an independent testing or certification program nationally recognized in the United States, that such motor meets the applicable [energy efficiency standards]," by either (i) testing at a third party independent laboratory accredited by a nationally recognized accrediting body, such as NVLAP, (ii) testing at the manufacturer's own laboratory if it is accredited by a nationally recognized accrediting body,

such as NVLAP,⁸ or (iii) certification by a nationally recognized third-party certification program.

3. Form of Certification

a. Compliance Statement. EPCA states that, "the Secretary shall require manufacturers to certify" that each electric motor meets applicable efficiency standards. EPCA section 345(c), 42 U.S.C. 6316(c). An example of how such language can be applied is found at 10 CFR 430.62, Submission of data, which requires manufacturers of consumer appliance products to submit a compliance statement, as well as a certification report that provides information for each basic model of a product. It appears, however, that there are many more basic models of electric motors than of each consumer appliance, and strictly applying the § 430.62 requirements to electric motors could be unduly burdensome to manufacturers and to the Department. The Department is aware of at least one manufacturer that claims to manufacture thousands of basic models of electric motors covered by the statute.

Statements from Reliance and NEMA address the difficulty of requiring compliance statements for all basic models a manufacturer produces. Reliance emphasizes that a manufacturer is likely to make a very large number of basic models. (Reliance, No. 8 at 3.b.3 and 3.d.1). Reliance also asserts that the Act requires manufacturers to certify that the nominal efficiency of the basic model meets or exceeds the level specified at section 342(b)(1) of EPCA for its rating, not the actual value of nominal efficiency for the motor. Reliance and NEMA recommend that each manufacturer submit a simplified compliance statement to certify that all its basic models of covered electric motors have a nominal full load efficiency equal to or in excess of the statutory nominal full load efficiency standards, as determined by actual testing or application of a substantiated alternative correlation method. (Reliance, No. 8 at 3.d.1 and NEMA, No. 9 at D.).

NEMA proposes as an alternative, that each manufacturer submit a compliance statement along with a certification report that provides information on each of the 113 ratings within which it produces motors. The 113 ratings refers

⁸The proposed regulations would permit testing at a laboratory accredited by a foreign organization recognized by NVLAP. Any test results produced by such laboratory would, of course, establish compliance with the Act and DOE's regulations only if the underlying testing were performed in accordance with the DOE test procedures.

to the combinations of horsepower, number of poles, and types of enclosure in the table of nominal full load efficiencies at section 342(b)(1) of EPCA, 42 U.S.C. 6313(b)(1). According to NEMA, the certification report would include, for each rating of electric motor which a manufacturer or private labeler manufactures, the nominal full load efficiency of the least efficient basic model with that rating. (NEMA, No. 9 at D.)

The Department believes that, contrary to the assertion by Reliance, it has the authority under the Act to require motor manufacturers to certify the nominal full load efficiency of a motor. But because there are so many basic models of electric motors, the Department proposes to require a single Compliance Certification that is quite similar to NEMA's alternative suggestion for certification. The proposed approach is designed to minimize the reporting burden on manufacturers, while fulfilling the purposes served by the statement of compliance and certification report required for appliances at 10 CFR 430.62. The proposed Compliance Certification at 10 CFR 431.123 would be a one-time statement which affirms that each basic model of electric motor meets the energy efficiency requirements of the statute, based upon actual testing or application of a substantiated alternative efficiency determination method. For each of the 113 ratings within which the manufacturer produces electric motors, it would identify the nominal full load efficiency of the basic model that has the lowest efficiency. At most, efficiencies would be included for 113 ratings. The Compliance Certification would also, in effect, certify that all basic models produced within each rating have a nominal full load efficiency equal to or in excess of the efficiency represented in the Compliance Certification for that rating.

b. *New Models.* EPCA requires each electric motor manufactured after the 60-month period beginning on the date of the enactment of this subsection, or in the case of an electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after the 84-month period beginning on such date, to meet a prescribed nominal full load efficiency level. EPCA section 342(b)(1), 42 U.S.C. 6313(b)(1). A manufacturer is required to comply with the statutory efficiency standards both for each motor it manufactures as of the statutory effective dates, and for each new basic model it begins to manufacture thereafter.

In order to comply with the statutory certification requirements, NEMA proposes that a manufacturer be required to submit a new certificate of compliance for a new basic model only if the new model's nominal full load efficiency is less than the nominal full load efficiency of other basic models, within the same rating, that are already being produced by the manufacturer and that have been previously certified to be in compliance with EPCA and DOE regulations. NEMA reasons that, "If a manufacturer's original certification reports only compliance by each class of 113 ratings, there is no need to require detailed reporting on the nominal efficiency of each new basic model, provided that such new basic model has a nominal full load efficiency in excess of the statutory standard and the efficiency certificated on the compliance statement for the relevant rating." (NEMA, No. 9 at D.3.)

Given the Department's proposal as to the initial Compliance Certification, NEMA's reasoning is persuasive. Moreover, based on information provided by manufacturers, there appears to be a potential for the introduction of numerous new basic models having the same ratings as motors already being manufactured. The Department seeks to avoid imposing a possible undue burden of excessive reporting of compliance of such new basic models. Therefore, it is proposed that submission of a Compliance Certification for a new basic model would be required only if (1) the manufacturer has not previously submitted to DOE a Compliance Statement for a motor having the same rating as the new basic model, or (2) the new model has the same rating as one or more of the basic models that have previously been produced and certified by the same manufacturer, but has a lower nominal full load efficiency than any of those previously certified basic models.

G. Enforcement

The Department proposes to establish procedures for enforcement testing which are appropriate for the equipment being tested for energy efficiency, in this case 1 through 200 horsepower alternating current electric motors. The proposed sampling plan for enforcement testing at appendix C to subpart G of this part is a departure from the procedures established at appendix B to subpart F of 10 CFR part 430—Sampling Plan for Enforcement Testing. The proposed sampling plan for enforcement testing is based upon NEMA MG1—12.58.2, Efficiency of Polyphase Squirrel-cage Medium Motors with

Continuous Ratings, and NEMA MG1 Table 12–8, Efficiency Levels, which establish a logical series of nominal motor efficiencies and the minimum associated with each nominal based on 20 percent loss difference. NIST formulated the proposed sampling plan for enforcement testing.

The sampling plan for enforcement testing of electric motors would aid the Department in performing actual testing pursuant to the test procedures prescribed in 10 CFR 431.23, and in achieving uniform application of enforcement testing. The objectives of the sampling plan for enforcement testing are (1) to provide for each motor an estimate of the true mean full load efficiency, (2) to establish reasonable measurement tolerances for motor efficiencies, and (3) to ensure that the result of the test is significant within these tolerances.

The sampling plan for enforcement testing assumes that the efficiencies of the entire population of motors are normally distributed about the true mean and that the true mean full load efficiency and standard deviation of the motor efficiencies are not known. Compliance (or non-compliance) can be determined when the mean efficiency of the basic model is not less than the statutory full load efficiency (SFE), thus only a lower bound for the mean efficiency must be specified. The proposed sampling plan for enforcement testing seeks to estimate the true mean efficiency of the basic model and to ensure that this mean efficiency is not less than the SFE, with high probability.

The Department believes that the best estimate of the true mean efficiency that may be obtained by tests conducted on a random sample is the mean efficiency of that sample (\bar{X}). The reliability of this estimate depends on two factors: (1) the size of the sample, i.e., the number of motors tested, and (2) the underlying variability of the entire population. The standard error in the mean ($SE(\bar{X})$), i.e., the standard deviation of the sample divided by the square root of the sample size, is one measure of the variability of the sample mean. In general, the ratio of the difference between \bar{X} and the true mean to $SE(\bar{X})$ is distributed according to a probability density function known in statistics literature as the t-distribution. Percentiles of this distribution are to determine confidence intervals and, in this case, to establish a lower bound. These percentiles are readily available and are included in many references on statistics.

The lower bound benchmark is calculated by determining the figure that would result if a population of motors meets the statutory standard

(i.e., the mean full load efficiency for the population meets or exceeds the statutory full load efficiency). If this is the case, and if *t* is the 90th percentile of the *t*-distribution appropriate for the sample size, then at least 90 percent of the time the average efficiency will be greater than the lower control limit, where:

$$LCL = SFE - tSE(\bar{X}).$$

The Department understands that in any statistical test there is a possibility of obtaining a false result by chance. In this case, by assumption, the basic model is in compliance and the sampling plan for enforcement testing should, with high probability, correctly demonstrate compliance or non-compliance. By design, the probability that the mean efficiency of a random sample drawn from this population would fall below the lower control limit and, hence, the risk of incorrectly concluding non-compliance, is no greater than 10 percent.

To apply this method, a random sample is tested and the mean and standard error in the mean are calculated. Based on the size of the sample and the confidence desired the appropriate *t* value is selected and the lower control limit calculated. For example, for 90 percent confidence and a sample of five units *t* equals 1.533. Provided the mean efficiency obtained from the random sample is not less than the lower control limit, the Department can determine with 90 percent confidence that the true mean efficiency of the entire population is not less than the statutory level.

Following this procedure, there is some probability that the estimate of the standard deviation and, therefore, the estimated standard error in the mean is too large and that the lower control limit may be set, by chance, to a value that defeats the purpose of the sampling plan for enforcement testing. To avoid this circumstance, it is sufficient to establish an upper limit for the standard error in the mean. The tolerance in the standard error should be chosen to be appropriate for the size and type of motor.

The strategy proposed here is to establish reasonable benchmarks for the standard error in the mean. One possible solution is to base these tolerances on the existing NEMA guidelines for identifying motor efficiency levels at NEMA MG1-12.58.2 and NEMA Table 12-8. Such guidelines were developed by consensus among motor manufacturers and they are followed, on a voluntary basis, by a large segment of the motor manufacturers. Under the NEMA

guidelines, no single unit can have energy losses more than 20 percent greater than the average losses for that type of motor, i.e., a 20 percent loss tolerance is permitted for a given unit but the average must still be met.

The NEMA guidelines serve to provide uniformity in motor efficiency labeling and can be used for purposes of quality control by manufacturers, and may, therefore, provide a reasonable basis for estimating efficiency tolerances among motors of different size and type. The Department believes that the 20 percent loss tolerance is reasonable and meaningful.

The variability in the motor efficiencies allowed, when $\bar{X}=SFE$, may be calculated by setting the true mean efficiency equal to the statutory value. The results of this procedure are presented below in Table 1. The Department assumes for these data that the sample size is five, and uses a single sided *t*-test and a 90% confidence level, i.e., *t* has been set to 1.533. Comparison of the standard deviation allowed by the sampling plan for enforcement testing with the NEMA 20 percent loss tolerance shows that the variability allowed corresponds to the NEMA guidelines.

To determine compliance (or non-compliance) for the purpose of enforcement testing, (a) the sample mean shall not be less than the LCL, as defined above, and (b) the product of the *t* percentile and the standard error in the mean may not exceed a 20 percent loss tolerance.

TABLE 1.—COMPARISON OF THE NEMA 20 PERCENT LOSS TOLERANCE AND THE STANDARD DEVIATIONS ALLOWED BY THE SAMPLING PLAN FOR ENFORCEMENT TESTING

Statutory efficiency	NEMA minimum efficiency	NEMA 20% loss tolerance	Enforcement standard deviation
75.5	72.0	3.5	5.1
80.0	77.0	3.0	4.4
82.5	80.0	2.5	3.6
84.0	81.5	2.5	3.6
85.5	82.5	3.0	4.4
86.5	84.0	2.5	2.5
87.5	85.5	2.0	3.0
88.5	86.5	2.0	3.0
89.5	87.5	2.0	3.0
90.2	88.5	1.7	2.5
91.0	89.5	1.5	2.2
91.7	90.2	1.5	2.2
92.4	91.0	1.4	2.0
93.0	91.7	1.3	1.9
93.6	92.4	1.2	1.8
94.1	93.0	1.1	1.6
94.5	93.6	0.9	1.3
95.0	94.1	0.9	1.3

IV. Review Under the National Environmental Policy Act of 1969

Pursuant to section 7(c)(2) of the Federal Energy Administration Act of 1974 (Pub. L. 93-275, 15 U.S.C. 766(a)), a copy of this notice has been submitted to the Administrator of the Environmental Protection Agency for comments concerning the impact of this proposed rulemaking on the quality of the environment.

In this rule, the Department proposes provisions to implement statutorily mandated energy efficiency standards and test procedures for electric motors. Implementation of the proposed rule would not result in environmental impacts. The Department has therefore determined that the proposed rule is covered under the Categorical Exclusion found at paragraph A.6 of appendix A to subpart D, 10 CFR part 1021, which applies to the establishment of procedural rulemakings. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

V. Review Under Executive Order 12866, "Regulatory Planning and Review"

This regulatory action is not a significant regulatory action under Executive Order 12866, "Regulatory Planning and Review," October 4, 1993. Accordingly, this action was not subject to review under the Executive Order by the Office of Information and Regulatory Affairs.

VI. Review Under the Regulatory Flexibility Act 1980

The Regulatory Flexibility Act of 1980, 5 U.S.C. 603, requires the preparation of an initial regulatory flexibility analysis for every rule which by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. A regulatory flexibility analysis examines the impact of the rule on small entities and considers alternative ways of reducing negative impacts.

The Department used the small business size standards published on January 31, 1996 by the Small Business Administration to determine whether any small entities would be required to comply with the proposed rule. 61 FR 3280 (to be codified at 13 CFR part 121). The size standards are listed by Standard Industrial Classification (SIC) code and industry description. Electric motor manufacturing is SIC 3621. To be considered a small business, a manufacturer of electric motors and its

affiliates may employ a maximum of 1,000 employees.

The Department estimates there are approximately 27 domestic firms and 14 foreign firms which manufacture electric motors covered under EPCA. Many of the domestic motor manufacturers are affiliated with larger U.S. or foreign firms. The sizes of motor manufacturing companies in the U.S. range from fewer than 100 employees to several thousand employees. The Department estimates that there are four to six firms in the United States that both manufacture electric motors covered by EPCA, and have, together with their affiliates, 1,000 or fewer employees.

EPCA prescribes efficiency standards for electric motors of specified horsepower, with some exceptions permitted. 42 U.S.C. 6313(b) (1) and (2). The statutory energy efficiency standards are incorporated in the proposed rule, although the standards do not depend on rulemaking for their implementation. The Act also requires DOE to prescribe test procedures for measuring motor efficiency, and it further requires the use, initially, of the test procedures in NEMA Standards Publication MG1-1987 and IEEE Standard 112 Test Method B, as in effect on October 24, 1992. 42 U.S.C. 6314(a)(5)(A). If the test procedures for motor efficiency are amended by those standards bodies, DOE is required to amend its test procedures accordingly unless to do so would not meet certain statutory criteria for test procedures. 42 U.S.C. 6314(a)(5)(B). The Act also requires DOE, by rule, to require motor manufacturers to include the energy efficiency of the motor on the permanent nameplate; to display the motor energy efficiency prominently in any catalogs and other materials used to market motors; and to include other markings DOE determines are necessary to facilitate enforcement of the energy efficiency standards. 42 U.S.C. 6315 (a) and (d). DOE also is directed by the Act to require manufacturers of covered motors to certify that the motor meets the applicable energy efficiency standard, through an independent testing program or certification program that is nationally recognized in the United States. 42 U.S.C. 6316(c).

Since approximately 1992, many manufacturers have been redesigning electric motors and testing them for compliance with the industry-developed energy efficiency performance standards that are the basis for the standards in the Act. Some manufacturers, including some small manufacturers, will need to make additional design changes and conduct

verification testing to bring all of their basic models into compliance with EPCA standards. DOE believes that the cost of complying with the proposed rule (excluding the cost of compliance with the energy efficiency standards and test procedures directly imposed by EPCA) would not impose significant economic costs on a significant number of small manufacturers.

The test procedures mandated by EPCA are test procedures already in general use in the industry. Small manufacturers contacted by the Department stated that they currently test electric motors in accordance with IEEE Standard 112, Test Method B. The proposed rule has been drafted to minimize the burden of testing for manufacturers, and the proposed rule relies heavily on industry practice and recommendations that have been submitted by manufacturers. Because there are so many basic models of electric motors, the Department proposes to require a compliance certification that includes listing, for each rating of electric motor, of the average efficiency only of the basic model that has the lowest efficiency. Consequently, efficiencies would be included for 113 ratings, at most. The proposed statistical sampling procedures are based on statistical sampling procedures established for consumer appliance products at 10 CFR 430.24, and recommendations submitted by the National Electrical Manufacturers Association (NEMA). The sampling procedures are designed to keep the testing burden on manufacturers as low as possible, while still providing confidence that the test results of units tested can be applied to units of the same basic model. The proposed maintenance of records and compliance reporting requirements are based largely on the statements and recommendations of NEMA.

DOE proposed labeling rules, required by the Act, also follow current practice and recommendations submitted by manufacturers through NEMA. The Department believes that the cost of including the energy efficiency and a Compliance Certification number on the permanent nameplate of electric motors covered under the Act would be negligible. Nameplates already are attached to motors, and standards generally followed in the industry require the energy efficiency to be marked on the nameplate. The proposed requirement to display the energy efficiency of motors in marketing materials only applies to materials the manufacturer otherwise chooses to distribute or publish. Thus, for example, catalogs would have to be updated to

include the energy efficiency number and the Compliance Certification number applicable to a motor only when the catalog is revised to include that motor.

Some manufacturers may not be able to certify compliance by October 24, 1997, the effective date as to most basic models for the standards and test procedures. The proposed rule eases the burden of compliance for such manufacturers of electric motors, including small manufacturers, by providing that the compliance certification requirement would not become effective until 24 months after the effective date of the rule. Furthermore, disclosure in a catalog of energy efficiency information concerning a particular motor would not be required until either the re-publication of the catalog after the rule becomes effective, or until the motor is subsequently included in the catalog.

It should be pointed out that DOE has limited discretion to apply different requirements to small manufacturers. EPCA mandates the use of uniform standards and testing procedures for all electric motors. EPCA also contains the basic requirements for labeling and certification. In this regard, it is noteworthy that although EPCA contains a "small manufacturer exemption" for consumer appliance product manufacturers (42 U.S.C. 6295(t)), no such exemption is included for manufacturers of commercial and industrial equipment.

The Department invites public comment on its conclusion that the incremental costs of complying with the proposed rule (not including the cost of requirements that are directly imposed by EPCA, such as the energy efficiency standards) would neither affect a substantial number of small businesses, nor impose a significant economic impact on such businesses.

VII. Review Under Executive Order 12612, "Federalism"

Executive Order 12612, "Federalism," 52 FR 41685 (October 30, 1987), requires that regulations, rules, legislation, and any other policy actions be reviewed for any substantial direct effect on States, on the relationship between the National Government and States, or in the distribution of power and responsibilities among various levels of government. If there are substantial effects, then the Executive Order requires preparation of a federalism assessment to be used in all decisions involved in promulgating and implementing a policy action.

The proposed rules published today would not regulate the States. They

primarily would affect the manner in which DOE promulgates commercial and industrial equipment energy efficiency standards, test procedures, labeling, and certification of compliance by manufacturers, prescribed under the Energy Conservation and Policy Act. State regulation in this area is largely preempted by the Energy Policy and Conservation Act. The proposed rules published today would not alter the distribution of authority and responsibility to regulate in this area. Accordingly, DOE has determined that preparation of a federalism assessment is unnecessary.

VIII. Review Under Executive Order 12630, "Governmental Actions and Interference With Constitutionally Protected Property Rights"

It has been determined pursuant to Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights," 52 FR 8859 (March 18, 1988), that this regulation would not result in any takings which might require compensation under the Fifth Amendment to the United States Constitution.

IX. Review Under the Paperwork Reduction Act of 1980

As explained above, the proposed rule includes certain labeling requirements, requires manufacturers to maintain records concerning their determinations of the energy efficiency of electric motors, and precludes distribution of any electric motor not covered by a certification of compliance submitted to the Department. These proposed information collection and recordkeeping requirements have been submitted to the Office of Management and Budget for review and approval under the Paperwork Reduction Act, 44 U.S.C. 3501, et seq. The proposed collections of information are necessary for implementing and monitoring compliance with the efficiency standards, testing, labeling and certification requirements for commercial and industrial electric motors mandated by EPCA. In developing the proposed information collection requirements, DOE considered the views of stakeholders that were received at a public meeting held in May of 1995, in written comments solicited in the notice of that meeting, and in subsequent informal contacts.

DOE estimates the number of covered manufacturing firms to be 41 and the number of hours required to comply with the reporting and recordkeeping requirements in the proposed rule to be

approximately 200 to 300 hours per year per firm. The total annual reporting and recordkeeping burden from compliance with the proposed rule is expected to be from 8,200 to 12,300 hours (41×200–300 hours per year). These estimates include time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing the collection of information.

In developing the burden estimates, DOE considered that each manufacturer is required to comply with the statutory energy efficiency standards for each motor it is manufacturing on the effective date of the Act, and for each model it begins to manufacture after that date. The required certification would be a one-time submission stating that the manufacturer has determined, by employing actual testing or an alternative method, that the basic model of electric motor meets the applicable energy efficiency standard. The certification also includes the energy efficiency for the least efficient basic model within each rating, and identifies those basic models that have undergone actual testing. Under the proposed rule, a compliance certification for a new basic model would be required only if (1) the manufacturer has not previously certified a motor having the same rating as the new basic model, or (2) the energy efficiency of the new model is less than the efficiency of previously-certified basic models of the same rating produced by the same manufacturer. Many manufacturers already submit this type of information to voluntary national electronic marketing programs, such as the Washington State Energy Office's "Motor Master" program, or develop it for the design or marketing of energy efficient motors. Those manufacturers should be able to comply with the certification required by the proposed rule without much additional burden.

Similarly, the remaining information collection requirements in the proposed rule would also impose little additional burden. Most manufacturers already voluntarily provide the energy efficiency of an electric motor on a motor's permanent nameplate and in their catalogs and other marketing materials, as would be required under the proposed rule. Inclusion of the CC number on motor nameplates was advocated by motor manufacturers, and this number could easily be included on nameplates and in marketing materials. A very limited amount of additional information would be required on import documents, at what the Department believes would be negligible cost. And, finally, the

Department understands that manufacturers already maintain the records the proposed rule would require them to keep.

The collections of information contained in this proposed rule are considered the least burdensome for meeting the legal requirements and achieving the program objectives of the DOE compliance certification program for electric motors. However, public comments are requested concerning the accuracy of the estimated paperwork reporting burden. Send comments regarding the recordkeeping and reporting burden estimate, or any other aspect of this collection of information, to the Department in accordance with the instructions in the **DATES** and **ADDRESSES** sections of this notice, as well as Section XIII, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for DOE."

X. Review Under Executive Order 12988, "Civil Justice Reform"

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 executive agencies the general duty to adhere to the following requirement: (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. With regard to the review required by section 3(a), section 3(b) of the Executive Order specifically requires 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 conduct while promoting simplification and burden reduction; (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 the Executive Order requires Executive agencies to review regulations in light of applicable standards in section 3(a) and section 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE reviewed today's final regulations under the standards of section 3 of the Executive Order and determined that, to the extent permitted

by law, they meet the requirements of those standards.

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

Pursuant to section 301 of the Department of Energy Organization Act (Pub. L. 95-91), the Department of Energy is required to comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977. 15 U.S.C. 788. Section 32 provides in essence that, where a proposed rule contains or involves use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards.

The rule proposed in this notice incorporates a number of commercial standards which the Act requires to be used. For example, the procedures required for measuring the efficiency of electric motors come from the NEMA Publication "Motors and Generators," MG1-1993 Revision 1; the Institute of Electrical and Electronics Engineers "Standard Test Procedure for Polyphase Induction Motors and Generators," IEEE Standard 112-1991 Test Method B for motor efficiency; and the Canadian Standards Association Standard C390-93 "Energy Efficiency Test Methods for Three-Phase Induction Motors." By way of further example, certain definitions in the proposed rule are drawn from NEMA Publication MG1. Because DOE has no discretion to not include these standards, section 32 of the FEAA has no application to them.

As part of its definition of electric motor, however, the proposed rule does employ one commercial standard, the International Electrotechnical Commission Standard 34-1, that the Act does not direct the Department to adopt. The Department has evaluated this Standard and is unable to conclude whether it fully complies with the requirements of section 32(b) of the Federal Energy Administration Act, i.e., that it was developed in a manner which fully provides for public participation, comment, and review.

As required by section 32(c) of the Act, the FEAA, Department will consult with the Attorney General and the Chairman of the Federal Trade Commission concerning the impact of this standard on competition, prior to prescribing a final rule.

XII. Review Under Unfunded Mandates Reform Act of 1995

Section 202 of the Unfunded Mandates Reform Act of 1995 ("Unfunded Mandates Act") (signed

into law on March 22, 1995) requires that the Department prepare a budgetary impact statement before promulgating a rule that includes a Federal mandate that may result in expenditure by state, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any one year. The budgetary impact statement must include: (i) Identification of the Federal law under which the rule is promulgated; (ii) a qualitative and quantitative assessment of anticipated costs and benefits of the Federal mandate and an analysis of the extent to which such costs to state, local, and tribal governments may be paid with Federal financial assistance; (iii) if feasible, estimates of the future compliance costs and of any disproportionate budgetary effects the mandate has on particular regions, communities, non-Federal units of government, or sectors of the economy; (iv) if feasible, estimates of the effect on the national economy; and (v) a description of the Department's prior consultation with elected representatives of state, local, and tribal governments and a summary and evaluation of the comments and concerns presented.

The Department has determined that the action proposed today does not include a Federal mandate that may result in estimated costs of \$100 million or more to state, local or to tribal governments in the aggregate or to the private sector. Therefore, the requirements of sections 203 and 204 of the Unfunded Mandates Act do not apply to this action.

XIII. Public Comment

A. Written Comment Procedures

Interested persons are invited to participate in the rulemaking by submitting data, comments, or information with respect to the proposed test procedures set forth in this notice to the address indicated at the beginning of the notice.

Comments should be identified both on the envelope and on the documents as "Test Procedures and Certification Requirements for Electric Motors, Docket No. EE-RM-96-400." Ten (10) copies are requested to be submitted. In addition, the Department requests that an electronic copy (3½" diskette) of the comments on WordPerfect™ 6.1 be provided. All submittals received by the date specified at the beginning of this notice will be considered by the Department in developing the final rule.

Pursuant to the provisions of 10 CFR 1004.11, any person submitting information which he or she believes to

be confidential and exempt by law from public disclosure should submit one complete copy of the document and ten (10) copies, if possible, from which the information believed to be confidential has been deleted. The Department of Energy will make its own determination with regard to the confidential status of the information and treat it according to its determination.

Factors of interest to the Department when evaluating requests to treat as confidential information that has been submitted include: (1) A description of the items; (2) an indication as to whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known by or available from other 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) an indication as to when such information might lose its confidential character due to the passage of time; and (7) why disclosure of the information would be contrary to the public interest.

B. Public Hearing

1. Procedures for Submitting Requests to Speak

The time and place of the public hearing are indicated at the beginning of this notice. The Department invites any person who has an interest in today's notice, or who is a representative of a group or class of persons that has an interest in these proposed test procedures, to make a request for an opportunity to make an oral presentation. Such requests should be directed to the address indicated at the beginning of this notice. Requests may be hand delivered to such address between the hours of 8 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Requests should be labeled "Test Procedures and Certification Requirements for Electric Motors, Docket No. EE-RM-96-400," both on the document and on the envelope.

The person making the request should briefly describe the interest concerned and state why he or she, either individually or as a representative of a group or class of persons that have such an interest, is an appropriate spokesperson, and give a telephone number where he or she may be contacted.

Each person selected to be heard is requested to submit advance copies of his or her statement prior to the hearing,

as indicated at the beginning of this notice. Any person wishing to testify who cannot meet this requirement, may at the Department's discretion be permitted to testify if that person has made alternative arrangements with the Office of Codes and Standards in advance. The letter making a request to give an oral presentation shall ask that such alternative arrangements be made.

2. Conduct of Hearing

A Department of Energy official will be designated to preside at the hearing. The hearing will not be a judicial or an evidentiary-type hearing, but will be conducted in accordance with 5 U.S.C. 553 and section 336 of the Act. The Department of Energy reserves the right to select the persons to be heard at the hearing, to schedule the respective presentations, and to establish the procedures governing the conduct of the hearing.

Each participant will be permitted to make a prepared general statement, limited to five (5) minutes, prior to the discussion of specific topics. The general statement should not address these specific topics. Other participants will be permitted to briefly comment on any general statements. The hearing will then be divided into segments, with each segment consisting of one or more topics covered by this notice, as follows: (1) Test procedures; (2) coverage and application of efficiency standards; (3) labeling; (4) certification; (5) enforcement; and (6) general statutory requirements (the matters in sections IV–XII above). Any issue concerning a definition in the proposed rule should be addressed during the discussion of the topic(s) to which that issue pertains.

The Department will introduce each topic with a brief summary of the relevant provisions of the proposed rule, and the significant issues involved. Participants in the hearing will then be permitted to make a prepared statement limited to five (5) minutes on that topic. At the end of all prepared statements on a topic, each participant will be permitted to briefly clarify his or her statement and comment on statements made by others. The Department is particularly interested in having participants address in their statements the specific issues set forth below in Section XIII–C, "Issues for Public Comment," and participants should be prepared to answer questions by the Department concerning these issues. Representatives of the Department may also ask questions of participants

concerning other matters relevant to the hearing. The total cumulative amount of time allowed for each participant to make prepared statements shall be 20 minutes.

The official conducting the hearing will accept additional comments or questions from those attending, as time permits. Any further procedural rules, or modification of the above procedures, needed for the proper conduct of the hearing will be announced by the presiding official.

A transcript of the hearing will be made, and the entire record of this rulemaking, including the transcript, will be retained by the Department of Energy and made available for inspection at the Department of Energy Freedom of Information Reading Room, Forrestal Building, Room 1E–190, 1000 Independence Avenue, SW, Washington, DC 20585–0101, (202) 586–6020, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Any person may purchase a copy of the transcript from the transcribing reporter.

C. Issues for Public Comment

The Department of Energy is interested in receiving comments and data concerning the accuracy and workability of these proposals and welcomes discussion on improvements or alternatives to these approaches. In particular, the Department is interested in gathering comments on the following:

1. Does the definition of "basic model" appropriately delineate motors with similar or different characteristics, and which should be grouped together or distinguished for purposes of measuring efficiency? What constitutes a difference between "basic models?" What are some examples of different basic models? Within a given rating, what is the likelihood of having different basic models?

2. Which electric motors are covered and which are not covered under the Act's definitions of "electric motor," "definite purpose motor," and "special purpose motor?" Comments are also sought on the Department's interpretation of these definitions, as expressed in this notice, and on whether the proposed definitions should be modified in any way. Do the definitions in the proposed regulation pose any practical problems, and are there particular motors that appear to be excluded from coverage that should be covered, and vice versa?

3. Is the proposed statistical sampling plan for testing appropriate for electric motors? Should a confidence limit higher than 90 percent be adopted? Should a different approach, or different figures, be adopted in place of the proposed divisor/coefficient?

4. In conjunction with using a label with the "ee" logo or "energy efficient" designation, should a manufacturer be required to display the minimum efficiency of the motor on the motor nameplate, and/or include such minimum efficiency in its compliance certification? Should the "ee" logo be *required* for complying motors, and if so, under what conditions?

5. Should the Department require that a Compliance Certification number be displayed on the nameplate of an electric motor, and in marketing materials for that motor? What are the benefits of such requirement(s)?

6. In addition to the proposal that import documents disclose the date of the Compliance Certification and the CC number for that motor, should import documents include a motor's nominal full load efficiency or other information? What will be the practical effect of requiring information on import documents?

7. What "independent testing" and "certification" programs exist or could come into existence within the next several years? Comments are also sought on the proposed provisions concerning recognition of accrediting bodies and certification organizations by the Department.

8. Does the sampling plan for enforcement testing: (1) Permit the Department to obtain an estimate of the true mean full load efficiency of the population of motors; (2) establish reasonable measurement tolerances for motor efficiencies; and (3) ensure that the results obtained by actual testing are significant within these tolerances?

List of Subjects in 10 CFR Part 431

Administrative practice and procedure, Energy conservation, Incorporation by reference.

Issued in Washington, DC, October 30, 1996.

Christine A. Ervin,
Assistant Secretary, *Energy Efficiency and Renewable Energy*.

For the reasons set forth in the preamble, Chapter II of Title 10, Code of Federal Regulations (CFR), is proposed to be amended by adding new part 431 to read as set forth below.

PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT: TEST PROCEDURES, LABELING, AND CERTIFICATION REQUIREMENTS FOR ELECTRIC MOTORS

Subpart A—General Provisions

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431.1 Purpose and scope.
431.2 Definitions.

Subpart B—Test Procedures and Materials Incorporated

- 431.21 Purpose and scope.
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431.23 Test procedures for measurement of energy efficiency.
431.24 Units to be tested.
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431.27 Department of Energy recognition of nationally recognized certification programs.
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Appendix A to Subpart B of Part 431—Uniform Test Method For Measuring Nominal Full Load Efficiency of Electric Motors

Appendix B to Subpart B of Part 431—Nominal Full Load Efficiency and Corresponding Coefficient K.

Subpart C—Energy Efficiency Standards

- 431.41 Purpose and scope.
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Subpart D—Petitions to Exempt State Regulation from Preemption; Petitions to Withdraw Exemption of State Regulation

- 431.61 Purpose and scope.

Subpart E—Labeling

- 431.81 Purpose and scope.
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Subpart F—[Reserved]

Subpart G—Certification and Enforcement

- 431.121 Purpose and scope.
431.122 Prohibited acts.
431.123 Compliance Certification.
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431.126 Exported equipment.
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431.128 Cessation of distribution of a basic model.
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431.130 Remedies.
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Appendix A to Subpart G of Part 431—Compliance Certification

Appendix B to Subpart G of Part 431—Sampling Plan for Enforcement Testing

Authority: 42 U.S.C. 6311–6316.

Subpart A—General Provisions

§ 431.1 Purpose and scope.

This part establishes the regulations for the implementation of Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6316, which establishes an energy conservation program for certain industrial equipment.

§ 431.2 Definitions.

For purposes of this part, words shall be defined as provided for in section 340 of the Act and as follows—

Accreditation means recognition by an authoritative body that a laboratory is competent to perform all of the specific test procedures that are required by or incorporated into this part.

Accreditation body means an organization or entity that conducts and administers an accreditation system and grants accreditation.

Accreditation system means a set of requirements to be fulfilled by a testing laboratory, as well as rules of procedure and management, that are used to accredit laboratories.

Accredited laboratory means a testing laboratory to which accreditation has been granted.

Act means the Energy Policy and Conservation Act of 1975, as amended (42 U.S.C. 6311 et seq.).

Alternative efficiency determination method or *AEDM* means a method of calculating the total power loss and average full load efficiency of an electric motor.

ANSI means American National Standards Institute.

Average full load efficiency means the average efficiency of a population of electric motors of duplicate design, where the efficiency of each motor in the population is the ratio (expressed as a percentage) of the motor's useful power output to its total power input when the motor is operated at its full rated load.

Basic model means all units of a given type of covered equipment (or class thereof) manufactured by a single manufacturer, and, with respect to electric motors, which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics which affect energy consumption or efficiency. For purpose of this definition, "rating" means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which

§ 431.42 prescribes nominal full load efficiency standards.

Certificate of conformity means a document that is issued by a certification program, and that gives written assurance that an electric motor complies with the energy efficiency standard applicable to that motor, as specified in 10 CFR 431.42.

Certification program means a certification system that determines conformity by electric motors with the energy efficiency standards prescribed by and pursuant to the Act.

Certification system means a system, that has its own rules of procedure and management, for giving written assurance that a product, process, or service conforms to a specific standard or other specified requirements, and that is operated by an entity independent of both the party seeking the written assurance and the party providing the product, process or service.

Covered equipment means industrial equipment of a type specified in section 340 of the Act.

CSA means the Canadian Standards Association.

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, or for use on a particular type of application, and which cannot be used in most general purpose applications.

Electric motor means a machine which converts electrical power into rotational mechanical power and which:

(1) Is a general purpose motor, including but not limited to motors with explosion-proof construction;

(2) Is a single speed, induction motor;

(3) Is rated for continuous duty operation, or is rated duty type S–1 (IEC);

(4) Contains a squirrel-cage or cage (IEC) rotor, and has foot-mounting, including foot-mounting with flanges or detachable feet;

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

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

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

(i) Rated 230 volts or 460 volts, or both, including any motor that is rated at multi-voltages that include 230 volts or 460 volts, or

(ii) Can be operated on 230 volts or 460 volts, or both.

(Terms in this definition followed by the parenthetical "IEC" shall be construed with reference to IEC Standard 34-1. Other terms in this definition, if not defined in this § 431.2, shall be construed with reference to NEMA Standards Publication MG1-1987.)

Enclosed motor means an electric motor so constructed as to prevent the free exchange of air between the inside and outside of the case but not sufficiently enclosed to be termed airtight.

EPCA means the Energy Policy and Conservation Act of 1975, as amended (42 U.S.C. 6311 et seq.).

General purpose motor means any motor which 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 MG1-1993, 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, or for a particular type of application, and which can be used in most general purpose applications.

IEC means the International Electrotechnical Commission.

IEEE means the Institute of Electrical and Electronics Engineers.

NEMA means the National Electrical Manufacturers Association.

Nominal full load efficiency of an electric motor means the nominal efficiency in Column A of Table 12-8, NEMA Standards Publication MG1-1993, that is either the closest lower value to, or that equals, the average full load efficiency of electric motors of the same design.

Open motor means an electric motor having ventilating openings which permit passage of external cooling air over and around the windings of the machine.

Special purpose motor means any motor that is designed for a particular application, and that either:

(1) Is designed in non-standard ratings with special operating characteristics or special mechanical construction, or

(2) Has special operating characteristics and special mechanical construction.

Total power loss means that portion of the energy used by an electric motor not converted to rotational mechanical power, expressed in percent.

Subpart B—Test Procedures and Materials Incorporated

§ 431.21 Purpose and scope.

This subpart contains test procedures for electric motors, required to be prescribed by DOE pursuant to section 343 of EPCA, 42 U.S.C. 6314, and identifies materials incorporated by reference in this Part.

§ 431.22 Reference sources.

(a) Materials Incorporated by Reference—(1) General. The following standards which are not otherwise set forth in this part 431 are incorporated by reference. The material listed in paragraph (a)(2) of this section has been approved for incorporation by reference by the Director of the Federal Register 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 the DOE test procedures unless and until amended by DOE. 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.

(2) List of standards incorporated by reference.

(i) National Electrical Manufacturers Association Standards Publication MG1-1993 with Revision 1, *Motors and Generators*, section 12.58.1, ("Determination of Motor Efficiency Losses"), Table 12-8 ("Efficiency Levels"), and section 14.02 ("Usual Service Conditions").

(ii) Institute of Electrical and Electronics Engineers, Inc., Standard 112-1991, *Test Procedure for Polyphase Induction Motors and Generators*.

(iii) Canadian Standards Association Standard C390-93, *Energy Efficiency Test Methods for Three-Phase Induction Motors*.

(3) Inspection of standards. The standards incorporated by reference are available for inspection at:

(i) Office of the Federal Register Information Center, 800 North Capitol Street, NW, Suite 700, Washington, DC;

(ii) U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Hearings and Dockets, "Test Procedures, Labeling, and Certification Requirements for Electric Motors," Docket No. EE-RM-96-400, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC 20585.

(4) Availability of standards. Standards incorporated by reference may be obtained from the following sources:

(i) Copies of IEEE Standard 112-1991 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; or the American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, (212) 642-4900 as ANSI/IEEE 112-1992;

(ii) Copies of NEMA Standards Publication MG1-1993 can be obtained from the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209, (703) 841-3200;

(iii) Copies of CSA Standard C390-93 can be obtained from the Canadian Standards Association, 178 Rexdale Boulevard, Rexdale (Toronto), Ontario, Canada M9W 1R3, (416) 747-4044.

§ 431.23 Test procedures for the measurement of energy efficiency.

The test procedures for measurement of whether an electric motor complies with the energy efficiency standards in § 431.42 shall be the test procedures specified in appendix A to this subpart B.

§ 431.24 Units to be tested.

When testing of an electric motor is required in order for a manufacturer to comply with an obligation imposed on it by or pursuant to Part C of Title III of EPCA, 42 U.S.C. 6311-6316, this section applies. This section does not apply to enforcement testing conducted pursuant to § 431.127.

(a) General requirements. The average full load efficiency of each basic model of electric motor shall be determined either by testing under paragraph (b)(1) of this section, or by application of an alternative efficiency determination method (AEDM) that meets the requirements of paragraphs (b) (2) and (3) of this section, provided, however, that an AEDM may be used to determine the average full load efficiency of one or more of a manufacturer's basic models only if the average full load efficiency of at least five of its other basic models is determined through testing.

(b) Specific requirements—(1) Testing. (i) Basic models shall be selected for testing in accordance with the following criteria:

(A) Two of the basic models must be among the five basic models with the highest unit volumes of production by the manufacturer in the prior year;

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

(C) The basic models should have different frame sizes without duplication; and

(D) Each basic model should be expected to have the lowest nominal full load efficiency among the basic models with the same rating.

(ii) In any instance where it is impossible for a manufacturer to select basic models for testing in accordance with all of the criteria in paragraph (b)(1)(i) of this section, 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.

(iii) For each basic model selected for testing,⁹ a sample of units shall be selected at random and tested in accordance with §§ 431.23 and 431.25, and appendix A, of this subpart. The sample shall be comprised of production units of the basic model, or units that are representative of such production units, and shall be of sufficient size to ensure that any represented value of the nominal or average full load efficiency of the basic model is no greater than the lesser of:

(A) The average full load efficiency of the sample, or

(B) The lower 90 percent confidence limit of the average full load efficiency of the entire population divided by the coefficient "K" applicable to the represented value. The coefficients are set forth in appendix B of this subpart.

(2) Alternative efficiency determination method. An AEDM applied to a basic model must be:

(i) Derived from a mathematical model that accurately represents the mechanical and electrical characteristics of that basic model, and

(ii) Based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data.

(3) Substantiation of an alternative efficiency determination method. Before an AEDM is used, its accuracy and reliability must be substantiated as follows:

(i) The AEDM must be applied to at least five basic models that have been selected for testing and tested in accordance with paragraph (b)(1) of this section, and

(ii) The predicted total power loss for each such basic model, calculated by applying the AEDM, must be within plus or minus ten percent of the mean total power loss determined from the actual testing of that basic model.

(4) Subsequent verification of an AEDM. (i) Each manufacturer shall periodically select basic models representative of those to which it has applied an AEDM, and for each basic model selected shall either:

(A) Subject a sample of units to testing in accordance with §§ 431.23 and 431.24(b)(1)(iii) by an accredited laboratory that meets the requirements of § 431.25,

(B) Have a certification body recognized under § 431.27 certify its nominal full load efficiency, or

(C) Have an independent state-registered professional engineer, who is not an employee of the manufacturer, review the manufacturer's representations and certify that the results of the AEDM accurately represent the total power loss and nominal full load efficiency of the basic model.

(ii) Each manufacturer that has used an AEDM under this section shall have available for inspection by the Department of Energy records showing: The method or methods used; the mathematical model, the engineering or statistical analysis, computer simulation or modeling, and other analytic evaluation of performance data on which the AEDM is based; complete test data, product information, and related information that the manufacturer has generated or acquired pursuant to paragraphs (a)(3) and (a)(4)(i) of this section; and the calculations used to determine the average full load efficiency and total power losses of each basic model to which an AEDM was applied.

(iii) If requested by the Department, the manufacturer shall conduct simulations to predict the performance of particular basic models of electric motors specified by the Department, analyses of previous simulations conducted by the manufacturer, sample testing of basic models selected by the Department, or a combination of the foregoing.

§ 431.25 Testing laboratories.

(a) Unless a certificate of conformity for a basic model of an electric motor is obtained from a certification program classified by DOE as nationally recognized under § 431.27, all testing of that basic model to meet the requirements of § 431.24 shall be carried out in an accredited laboratory for which the accreditation body was:

(1) The National Voluntary Laboratory Accreditation Program (NVLAP), or

(2) A foreign organization recognized by NVLAP, or

(3) An organization classified by the Department, pursuant to § 431.26, as an accreditation body.

(b) NVLAP is under the auspices of the National Institute of Standards and Technology (NIST) which is part of the U.S. Department of Commerce. 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, August 1995, presents the technical requirements of the National Voluntary Laboratory Accreditation Program 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 part 285 of Title 15 of the U.S. Code of Federal Regulations plus all general NVLAP procedures, criteria, and policies. Changes in NVLAP's criteria, procedures, policies, standards or other bases for granting accreditation, occurring subsequent to 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 NVLAP can be obtained from NIST/NVLAP, Building 411, Room A162, Gaithersburg, MD 20899, telephone (301) 975-4016, or telefax (301) 926-2884.

§ 431.26 Department of Energy recognition of accreditation bodies.

(a) Petition. An organization requesting classification by the Department of Energy as an accreditation body must submit a petition to the Department requesting such classification, and must demonstrate that it meets the criteria in paragraph (b) of this section.

(b) Evaluation criteria. To be classified as an accreditation body by the Department, the organization must meet the following criteria:

(1) It must have standards and procedures for conducting and administering an accreditation system and for granting accreditation.

(2) It must be independent of 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 perform the accrediting function 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 Test Method B and CSA Standard C390 Test Method (1), or similar procedures and methodologies for determining the energy efficiency of electric motors.

(c) Petition format. Each petition requesting classification as an

⁹Components of similar design may be substituted without requiring additional testing if the represented measures of energy consumption continue to satisfy the applicable sampling provision.

accreditation body must contain a narrative statement as to why the organization meets the criteria set forth in paragraph (b) of this section, must be signed on behalf of the organization by an authorized representative, and must be accompanied by documentation that supports the narrative statement. The following provides additional guidance:

(1) Standards and procedures. A copy of the organization's standards and procedures for operating an accreditation system and for granting accreditation should accompany the petition.

(2) Independent status. The petitioning organization should identify and describe any relationship, direct or indirect, that it 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 it in performing as an accreditation body for electric motor testing laboratories. It should explain why it believes such relationship(s) would not compromise its independence as an accreditation body.

(3) Qualifications to do accrediting. Experience in accrediting 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 58, *Calibration and testing laboratory accreditation systems—General requirements for operation and recognition*, 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 electric motor test procedures. The petition should set forth the organization's experience with the test procedures and methodologies in IEEE Standard 112 Test Method B and CSA Standard C390 Test Method (1), 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*, to energy efficiency testing for electric motors.

(d) Disposition. The Department will evaluate the petition, determine whether the applicant meets the criteria in paragraph (b) of this section to be classified as an accrediting body, advise

the applicant of its determination, and give public notice of any affirmative determination. The Department's determination may be based solely on the applicant's petition and supporting documents, or may also be based on such additional information as it deems appropriate. The Department may request that the applicant provide additional relevant information to supplement its petition, or may conduct an investigation.

§ 431.27 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 of EPCA ("nationally recognized"), the organization operating the program must demonstrate the program's eligibility for such classification, and must submit a petition to the Department requesting such classification.

(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 standards and procedures for conducting and administering a certification system and for granting a certificate of conformity.

(2) It must be independent of 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 Test Method B and CSA Standard C390 Test Method (1), or similar procedures and methodologies for determining the energy efficiency of electric motors.

(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 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 electric motor test procedures. The petition should set forth the program's experience with the test procedures and methodologies in IEEE Standard 112 Test Method B and CSA Standard C390 Test Method (1), 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 electric motors.

(d) Disposition. The Department will evaluate the petition, determine whether the applicant meets the criteria

in paragraph (b) of this section for classification as a nationally recognized certification program, advise the applicant of its determination, and give public notice of any affirmative determination. The Department's determination may be based solely on the applicant's petition and supporting documents, or may also be based on such additional information as it deems appropriate. The Department may request that the applicant provide additional relevant information to supplement its petition, or may conduct an investigation.

§ 431.28 Petitions for waiver and applications for interim waiver.

The provisions of 10 CFR 430.27 shall apply with respect to this part 431, to the same extent and in the same manner as they apply in part 430. In applying § 430.27 for purposes of this part, the term "§ 430.22" shall be deemed to mean "section 431.23," and the term "§ 322(a)" shall be deemed to mean "section 340(1)."

Appendix A 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 are applicable to this appendix.

2. Test procedures

Efficiency and losses shall be determined in accordance with NEMA MG1-1993 with Revision 1, section 12.58.1, Determination of Motor Efficiency and Losses, and either IEEE Standard 112 Test Method B, Input-Output with Loss Segregation, or Canadian Standards Association Standard C390 Test Method (1), Input-Output Method with

Indirect Measurement of the Stray-Load Loss and Direct Measurement of the Stator Winding (I²R), Rotor Winding (I²R), Core and Windage-Friction Losses.

3. Amendments to test procedures

Any revision to IEEE Standard 112-1991, Test Method B, to § 12.58.1 of NEMA Standards Publication MG1-1993 with Revision 1, or to CSA Standard C390-93, Test Method (1), subsequent to promulgation of this appendix A, shall not be effective for purposes of test procedures required under part 431 and this appendix A, unless and until part 431 and this appendix A are amended.

Appendix B to Subpart B of Part 431—Nominal Full Load Efficiency and Corresponding Coefficient K

The coefficient K is used for calculating permitted represented values of energy efficiency. From the table below, select the coefficient K for the nominal full load efficiency that is equal to, or is the closest lower value to, the represented value.

Nominal full load efficiency	Coefficient K
99.0	0.998
98.9	0.998
98.8	0.998
98.7	0.998
98.6	0.998
98.5	0.997
98.4	0.996
98.2	0.996
98.0	0.996
97.8	0.996
97.6	0.995
97.4	0.994
97.1	0.994
96.8	0.994
96.5	0.993
96.2	0.992
95.8	0.992
95.4	0.991
95.0	0.990

Nominal full load efficiency	Coefficient K
94.5	0.990
94.1	0.988
93.6	0.987
93.0	0.986
92.4	0.985
91.7	0.984
91.0	0.984
90.2	0.981
89.5	0.978
88.5	0.977
87.5	0.977
86.5	0.971
85.5	0.965
84.0	0.970
82.5	0.970
81.5	0.963
80.0	0.963
78.5	0.962
77.0	0.961
75.5	0.954

Subpart C—Energy Efficiency Standards

§ 431.41 Purpose and scope.

This subpart contains energy efficiency standards for certain types of covered equipment pursuant to Part C—Certain Industrial Equipment, Energy Policy and Conservation Act, as amended (42 U.S.C. 6211 et seq.).

§ 431.42 Energy efficiency standards and effective dates.

(a) Each electric motor manufactured (alone or as a component of another piece of equipment) after October 24, 1997, or in the case of an electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after October 24, 1999, shall have a nominal full load efficiency of not less than the following:

Number of poles	Nominal full load efficiency					
	Open motors			Enclosed motors		
	6	4	2	6	4	2
Motor Horsepower/Standard Kilowatt Equivalent						
1/75	80.0	82.5	80.0	82.5	75.5
1.5/1.1	84.0	84.0	82.5	85.5	84.0	82.5
2/1.5	85.5	84.0	84.0	86.5	84.0	84.0
3/2.2	86.5	86.5	84.0	87.5	87.5	85.5
5/3.7	87.5	87.5	85.5	87.5	87.5	87.5
7.5/5.5	88.5	88.5	87.5	89.5	89.5	88.5
10/7.5	90.2	89.5	88.5	89.5	89.5	89.5
15/11	90.2	91.0	89.5	90.2	91.0	90.2
20/15	91.0	91.0	90.2	90.2	91.0	90.2
25/18.5	91.7	91.7	91.0	91.7	92.4	91.0
30/22	92.4	92.4	91.0	91.7	92.4	91.0
40/30	93.0	93.0	91.7	93.0	93.0	91.7
50/37	93.0	93.0	92.4	93.0	93.0	92.4
60/45	93.6	93.6	93.0	93.6	93.6	93.0
75/55	93.6	94.1	93.0	93.6	94.1	93.0
100/75	94.1	94.1	93.0	94.1	94.5	93.6
125/90	94.1	94.5	93.6	94.1	94.5	94.5
150/110	94.5	95.0	93.6	95.0	95.0	94.5

Number of poles	Nominal full load efficiency					
	Open motors			Enclosed motors		
	6	4	2	6	4	2
200/150	94.5	95.0	94.5	95.0	95.0	95.0

(b) For purposes of determining the required minimum nominal full load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepowers or kilowattages listed consecutively in paragraph (a) of this section, each such motor shall be deemed to have a horsepower or kilowatt rating that is listed in paragraph (a) of this section. The rating that the motor is deemed to have shall be 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, without calculating beyond three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraph (b)(1) or (b)(2) of this section, whichever applies.

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

Subpart D—Petitions To Exempt State Regulation From Preemption; Petitions To Withdraw Exemption of State Regulation

§ 431.61 Purpose and scope.

The provisions of 10 CFR 430.40 through 430.49 shall apply with respect to this part 431, to the same extent and in the same manner as they apply in part 430. In applying §§430.40 through 430.49 for purposes of this part, the term “energy conservation standard” shall be deemed to mean “energy efficiency standard,” and the term “product” shall be deemed to mean “equipment.”

Subpart E—Labeling

§ 431.81 Purpose and scope.

This subpart establishes labeling rules for electric motors pursuant to section 344 of EPCA, 42 U.S.C. 6315. It addresses labeling and marking the equipment with information indicating its energy efficiency and compliance with applicable standards under section

342 of EPCA, 42 U.S.C 6313, and the inclusion of such information in other material used to market the equipment.

§ 431.82 Labeling requirements.

(a) Electric motor nameplate—(1) Required information. The permanent nameplate of an electric motor for which standards are prescribed in § 431.42 shall be marked clearly with the following information:

(i) The motor’s nominal full load efficiency (as of the date of manufacture), derived from the motor’s average full load efficiency as determined pursuant to subpart B of this part;

(ii) The Compliance Certification (“CC”) number supplied by DOE to the manufacturer pursuant to § 431.123(e), and applicable to that motor. A CC number shall be applicable to a motor 90 days after either:

(A) The manufacturer has received the number upon submitting a Compliance Certification covering that motor, or

(B) The expiration of 21 days from DOE’s receipt of a Compliance Certification covering that motor, if the manufacturer has not been advised by DOE that the Compliance Certification fails to satisfy § 431.123.

(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 § 12.58.2 of NEMA MG1–1993, as for example “NEMA Nom. Eff.

_____.” The DOE number shall be in the form “CC_____.”

(3) Optional display. The permanent nameplate of an electric motor, a separate plate, or decalcomania, may be marked with the words “energy efficient,” or with the circled lower case letters “ee”, or with some comparable designation or logo, if the motor meets the applicable standard prescribed in § 431.42, as determined pursuant to subpart B of this part, and is covered by a Compliance Certification that satisfies § 431.123.

(b) Disclosure of efficiency information in marketing materials. (1)

The same information that must appear on an electric motor’s permanent nameplate pursuant to paragraph (a)(1) of this section, shall be prominently displayed:

(i) On each page of a catalog that lists the motor, and

(ii) In other materials used to market the motor.

(2) The “ee” logo, the words “energy efficient,” or other similar logo or designations, may also be used in catalogs and other materials to the same extent they may be used on labels under paragraph (a)(3) of this section.

(c) Import documents. Any electric motor imported into the United States shall be accompanied by shipping papers that disclose clearly the date of the Compliance Certification for that motor, and the Compliance Certification number applicable to that motor in accordance with paragraph (a)(1)(ii) of this section.

(d) Other motors. A manufacturer, distributor, retailer, or private labeler may voluntarily comply with or implement any of the subparagraphs of paragraph (a) or (b) of this section with respect to any electric motor manufactured prior to October 24, 1997, any definite purpose motor, or any special purpose motor. Any such motor that is labeled with information required or permitted for electric motors under this section, shall be deemed to be an “electric motor” for purposes of:

(1) The provision of this section that requires or permits such labeling information, and

(2) The requirements of this part concerning standards, testing, certification and enforcement that are related to that provision. Any certification of compliance submitted for purposes of this paragraph shall be submitted on a Compliance Certification that covers only non-covered motors, and that is clearly labeled as such on the first page and on the first page of the attachment.

Subpart F—[Reserved]

Subpart G—Certification and Enforcement

§ 431.121 Purpose and scope.

The regulations in this subpart set forth the procedures for manufacturers to certify that electric motors comply

with the applicable energy efficiency standards set forth in subpart C of this part, and set forth standards and procedures for enforcement of this part and the underlying provisions of the Act.

§ 431.122 Prohibited acts.

(a) Each of the following is a prohibited act pursuant to sections 332 and 345 of the Act:

(1) Distribution in commerce by a manufacturer or private labeler of any new covered equipment which is not labeled in accordance with an applicable labeling rule prescribed in accordance with section 344 of the Act, and in this part;

(2) Removal from any new covered equipment or rendering illegible, by a manufacturer, distributor, retailer, or private labeler, of any label required under this part to be provided with such equipment;

(3) Failure to permit access to, or copying of records required to be supplied under the Act and this part, or failure to make reports or provide other information required to be supplied under the Act and this part;

(4) Advertisement of covered equipment, by a manufacturer, distributor, retailer, or private labeler, in a catalog from which the equipment may be purchased, without including in the catalog all information as required by § 431.82(b)(2), provided, however, that this shall not apply to an advertisement of covered equipment in a catalog if distribution of the catalog began before the effective date of the labeling rule applicable to that equipment;

(5) Failure of a manufacturer to supply at his expense a reasonable number of units of an electric motor to a test laboratory designated by the Secretary;

(6) Failure of a manufacturer to permit a representative designated by the Secretary to observe any testing required by the Act and this part, and to inspect the results of such testing; and

(7) Distribution in commerce by a manufacturer or private labeler of any new covered equipment which is not in compliance with an applicable energy efficiency standard prescribed under the Act and this part.

(b) In accordance with sections 333 and 345 of the Act, any person who knowingly violates any provision of paragraph (a) of this section may be subject to assessment of a civil penalty of no more than \$100 for each violation. Each violation of paragraphs (a) (1), (2), and (7) of this section shall constitute a separate violation with respect to each unit of covered equipment, and each

day of noncompliance with paragraphs (a) (3) through (6) of this section shall constitute a separate violation.

(c) For purposes of this section, the term *new covered equipment* means covered equipment the title of which has not passed to a purchaser who buys such equipment for purposes other than

(1) Reselling such equipment, or

(2) Leasing such equipment for a period in excess of one year.

§ 431.123 Compliance Certification.

(a) General. Beginning 24 months after [effective date of rule], a manufacturer or private labeler shall not distribute in commerce any basic model of an electric motor subject to an energy efficiency standard set forth in subpart C of this part unless it has submitted to the Department a Compliance Certification certifying, in accordance with the provisions of this section, that the basic model meets the requirements of the applicable standard. Such certification must be based upon a determination made in accordance with the applicable requirements of subpart B of this part.

(b) Required contents. (1) General representations. Each Compliance Certification shall certify that:

(i) The nominal full load efficiency for each basic model of electric motor distributed is not less than the minimum nominal full load efficiency required for that motor by § 431.42;

(ii) All required determinations on which the Compliance Certification is based were made in compliance with the applicable requirements prescribed in subpart B of this part;

(iii) All information reported in the Compliance Certification is true, accurate, and complete; and

(iv) The manufacturer or private labeler is aware of the penalties associated with violations of the Act and the regulations thereunder, and 18 U.S.C. 1001 which prohibits knowingly making false statements to the Federal Government.

(2) Specific data. (i) For each rating of electric motor (as the term "rating" is defined in the definition of basic model) which a manufacturer or private labeler distributes, the Compliance Certification shall report the average full load efficiency, determined pursuant to §§ 431.23 and 431.24, of the least efficient basic model within that rating.

(ii) The Compliance Certification shall identify the basic models on which actual testing has been performed to meet the requirements of § 431.24.

(iii) The format for a Compliance Certification is set forth in appendix A of this subpart.

(c) Signature and submission. A manufacturer or private labeler shall

submit the Compliance Certification either on its own behalf, signed by a corporate officer of the company, or through a third party (for example, a trade association or other authorized representative) acting on its behalf. Where a third party is used, the Compliance Certification shall identify the official of the manufacturer or private labeler who authorized the third party to make representations on the company's behalf, and shall be signed by a corporate official of the third party. The Compliance Certification shall be submitted to the Department by certified mail, to Department of Energy, Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Codes and Standards, Forrestal Building, 1000 Independence Avenue, SW, Washington, DC 20585-0121.

(d) New basic models. For electric motors, a Compliance Certification shall be submitted for a new basic model only if the manufacturer or private labeler has not previously submitted to DOE a Compliance Certification, that meets the requirements of § 431.123, for a basic model that has the same rating as the new basic model, and that has a lower nominal full load efficiency than the new basic model.

(e) Response to Certification; Certification Number for Electric Motors. Promptly upon receipt of a Compliance Certification, the Department shall determine whether the document contains all of the elements required by this section, and may, in its discretion, determine whether all or part of the information provided in the document is accurate. The Department shall then advise the submitting party in writing either that the Compliance Certification does not satisfy the requirements of this section, in which case the document shall be returned, or that the Compliance Certification satisfies this section, and the basis for the determination. When advising that the initial Compliance Certification submitted by or on behalf of a manufacturer or private labeler is acceptable, DOE shall provide a unique number, "CC _____," to the manufacturer or private labeler.

§ 431.124 Maintenance of records.

(a) The manufacturer of any electric motor subject to energy efficiency standards prescribed under section 342 of the Act shall establish, maintain and retain records of the following: The underlying test data for all actual testing conducted under this part; the development, substantiation, application, and subsequent verification of any AEDM used under this part; and any certificate of conformity relied on

under the provisions of this part. Such records shall be organized and indexed in a fashion which makes them readily accessible for review. The records should include the supporting test data associated with tests performed on any test units to satisfy the requirements of this subpart (except tests performed by the Department directly).

(b) All such records shall be retained by the manufacturer for a period of two years from the date that production of the applicable basic model of electric motor has ceased. Records shall be retained in a form allowing ready access to the Department upon request.

§ 431.125 Imported equipment.

The provisions of 10 CFR 430.64 shall apply with respect to this part 431, to the same extent and in the same manner as they apply in part 430. In applying § 430.64 for purposes of this part, the term "section 331" shall be deemed to mean "sections 331 and 345," and the term "product" shall be deemed to mean "equipment."

§ 431.126 Exported equipment.

The provisions of 10 CFR 430.65 shall apply with respect to this part 431, to the same extent and in the same manner as they apply in part 430. In applying § 430.65 for purposes of this part, the term "sections 330 and 345" shall be substituted for the term "section 330," and the term "equipment" shall be substituted for the term "product."

§ 431.127 Enforcement.

(a) *Test notice.* Upon receiving information in writing, concerning the energy performance of a particular electric motor sold by a particular manufacturer or private labeler, which indicates that the electric motor may not be in compliance with the applicable energy efficiency standard, or upon undertaking to ascertain the accuracy of information disclosed pursuant to subpart E of this part, the Secretary may conduct testing of that covered equipment under this subpart by means of a test notice addressed to the manufacturer in accordance with the following requirements:

(1) The test notice procedure will only be followed after the Secretary or his/her designated representative has examined the underlying test data (or, where appropriate, data as to use of an alternative efficiency determination method) provided by the manufacturer and after the manufacturer has been offered the opportunity to meet with the Department to verify compliance with the applicable efficiency standard. In addition, where compliance of a basic model was certified based on an AEDM,

the Department shall have the discretion to pursue the provisions of § 431.24(b)(4)(iii) prior to invoking the test notice procedure. A representative designated by the Secretary shall be permitted to observe any reverification procedures undertaken pursuant to this subpart, and to inspect the results of such reverification.

(2) The test notice will be signed by the Secretary or his/her designee. The test notice will be mailed or delivered by the Department to the plant manager or other responsible official, as designated by the manufacturer.

(3) The test notice will specify the model or basic model to be selected for testing, the method of selecting the test sample, the date and time at which testing shall be initiated, the date by which testing is scheduled to be completed and the facility at which testing will be conducted. The test notice may also provide for situations in which the selected basic model is unavailable for testing, and may include alternative basic models.

(4) The Secretary may require in the test notice that the manufacturer of an electric motor shall ship at his expense a reasonable number of units of a basic model specified in such test notice to a testing laboratory designated by the Secretary. The number of units of a basic model specified in a test notice shall not exceed twenty (20).

(5) Within five working days of the time the units are selected, the manufacturer shall ship the specified test units of a basic model to the testing laboratory.

(b) *Testing laboratory.* Whenever the Department conducts enforcement testing at a designated laboratory in accordance with a test notice under this section, the resulting test data shall constitute official test data for that basic model. Such test data will be used by the Department to make a determination of compliance or noncompliance if a sufficient number of tests have been conducted to satisfy the requirements of appendix C of this subpart.

(c) *Sampling.* The determination that a manufacturer's basic model complies with the applicable energy efficiency standard shall be based on the testing conducted in accordance with the statistical sampling procedures set forth in appendix B of this subpart and the test procedures set forth in subpart B of this part.

(d) *Test unit selection.* A Department inspector shall select a batch, a batch sample, and test units from the batch sample in accordance with the provisions of this paragraph and the conditions specified in the test notice.

(1) The batch may be subdivided by the Department utilizing criteria specified in the test notice.

(2) A batch sample of up to 20 units will then be randomly selected from one or more subdivided groups within the batch. The manufacturer shall keep on hand all units in the batch sample until such time as the basic model is determined to be in compliance or non-compliance.

(3) Individual test units comprising the test sample shall be randomly selected from the batch sample.

(4) All random selection shall be achieved by sequentially numbering all of the units in a batch sample and then using a table of random numbers to select the units to be tested.

(e) *Test unit preparation.* (1) Prior to and during the testing, a test unit selected in accordance with paragraph (d) of this section shall not be prepared, modified, or adjusted in any manner unless such preparation, modification, or adjustment is allowed by the applicable Department of Energy test procedure. One test shall be conducted for each test unit in accordance with the applicable test procedures prescribed in subpart B of this part.

(2) No quality control, testing, or assembly procedures shall be performed on a test unit, or any parts and sub-assemblies thereof, that is not performed during the production and assembly of all other units included in the basic model.

(3) A test unit shall be considered defective if such unit is inoperative or is found to be in noncompliance due to failure of the unit to operate according to the manufacturer's design and operating instructions. Defective units, including those damaged due to shipping or handling, shall be reported immediately to the Department. The Department shall authorize testing of an additional unit on a case-by-case basis.

(f) *Testing at manufacturer's option.*

(1) If a manufacturer's basic model is determined to be in noncompliance with the applicable energy performance standard at the conclusion of Department testing in accordance with the sampling plan specified in appendix C of this subpart, the manufacturer may request that the Department conduct additional testing of the basic model according to procedures set forth in appendix B of this subpart.

(2) All units tested under this paragraph shall be selected and tested in accordance with the provisions given in paragraphs (a) through (e) of this section.

(3) The manufacturer shall bear the cost of all testing conducted under this paragraph.

(4) The manufacturer shall cease distribution of the basic model tested under the provisions of this paragraph from the time the manufacturer elects to exercise the option provided in this paragraph until the basic model is determined to be in compliance. The Department may seek civil penalties for all units distributed during such period.

(5) If the additional testing results in a determination of compliance, a notice of allowance to resume distribution shall be issued by the Department.

§ 431.128 Cessation of distribution of a basic model.

The provisions of 10 CFR 430.71 shall apply with respect to this part 431, to the same extent and in the same manner they apply in part 430. In applying § 430.71 for purposes of this part, the term “§ 430.70” shall be deemed to mean “§ 431.127.”

§ 431.129 Subpoena.

The provisions of 10 CFR 430.72 shall apply with respect to this part 431, to the same extent and in the same manner as they apply in part 430. In applying § 430.72 for purposes of this part, the term “section 329(a)” shall be deemed to mean “sections 329(a) and 345.”

§ 431.130 Remedies.

The provisions of 10 CFR 430.73 shall apply with respect to this part 431, to the same extent and in the same manner as they apply in part 430. In applying § 430.73 for purposes of this part, the term “conservation” shall be deemed to mean “efficiency,” the term “section 334” shall be deemed to mean “sections 334 and 345” and the term “section 333” shall be deemed to mean “sections 333 and 345.”

§ 431.131 Hearings and appeals.

The provisions of 10 CFR 430.74 shall apply with respect to this part 431, to the same extent and in the same manner as they apply in part 430. In applying § 430.74 for purposes of this part, the term “conservation” shall be deemed to

mean “efficiency,” the term “section 334” shall be deemed to mean “sections 334 and 345” and the term “section 333” shall be deemed to mean “sections 333 and 345.”

§ 431.132 Confidentiality.

The provisions of 10 CFR 430.75 shall apply with respect to this part 431, to the same extent and in the same manner as it applies in part 430.

Appendix A to Subpart G of Part 431— Compliance Certification

Certification of Compliance With Energy Efficiency Standards for Electric Motors

Name and Address of Company (the “company”):

Type(s) of Electric Motor(s):

Submit by Certified Mail to: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Office of Codes and Standards, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0121.

This Compliance Certification reports on and certifies compliance with requirements contained in 10 CFR Part 431 (Energy Conservation Program for Certain Commercial and Industrial Equipment) and Part C of the Energy Policy and Conservation Act (Public Law 94-163), and amendments thereto. It is signed by a responsible official of the above named company. Attached and incorporated as part of this Compliance Certification is a Listing of Electric Motor Efficiencies. For each rating of electric motor * for which the Listing specifies the nominal full load efficiency of a basic model, the company distributes no less efficient basic model with that rating and all basic models with that rating comply with the applicable energy efficiency standard.

Name of Person to Contact for Further Information:

Name: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

If any part of this Compliance Certification, including the Attachment, was prepared by a third party organization under the provisions of section 431.123 of 10 CFR Part 431, the company official authorizing third party representations:

Name: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

The third party organization officially acting as representative:

Third Party Organization: _____

Name: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

All required determinations on which this Compliance Certification is based were made in conformance with the applicable requirements in 10 CFR Part 431, subpart B. All information reported in this Compliance Certification is true, accurate, and complete. The company is aware of the penalties associated with violations of the Act and the regulations thereunder, and is also aware of the provisions contained in 18 U.S.C 1001, which prohibits knowingly making false statements to the Federal Government.

Signature: _____

Date: _____

Name: _____

Title: _____

Firm or Organization: _____

Attachment to Certification of Compliance With Energy Efficiency Standards for Electric Motors Listing of Electric Motor Efficiencies

Date: _____

Name of company _____

Rating of electric motor			Least efficient basic model (model number(s))	Average full load efficiency
Motor horsepower	Number of poles	Open or enclosed motor		
1	6	Open	_____	_____
1	4	Open	_____	_____
1	6	Enclosed	_____	_____
1	4	Enclosed	_____	_____
1	2	Enclosed	_____	_____
1.5	6	Open	_____	_____
1.5	4	Open	_____	_____

* The term “rating” means one of the 113 combinations of an electric motor’s horsepower (or standard kilowatt equivalent), number of poles, and

open or enclosed construction, with respect to which section 431.42 of 10 CFR Part 431 prescribes nominal full load efficiency standards.

Rating of electric motor			Least efficient basic model (model number(s))	Average full load efficiency
Motor horsepower	Number of poles	Open or enclosed motor		
1.5	2	Open	_____	_____
1.5	6	Enclosed	_____	_____
1.5	4	Enclosed	_____	_____
1.5	2	Enclosed	_____	_____
etc	etc	etc	_____	_____

Rating of electric motor			Least efficient basic model (model number(s))	Average full load efficiency
Motor kilowatts	Number of poles	Open or enclosed motor		
.75	6	Open	_____	_____
.75	4	Open	_____	_____
.75	6	Enclosed	_____	_____
.75	4	Enclosed	_____	_____
.75	2	Enclosed	_____	_____
1.1	6	Open	_____	_____
1.1	4	Open	_____	_____
1.1	2	Open	_____	_____
1.1	6	Enclosed	_____	_____
1.1	4	Enclosed	_____	_____
1.1	2	Enclosed	_____	_____
etc	etc	etc	_____	_____

Note: The manufacturer shall place an asterisk beside each reported nominal full load efficiency that is determined by actual testing rather than by application of an alternative efficiency determination method. The manufacturer shall also list below additional basic models that were subjected to actual testing.

Basic Model means all units of a given type of covered equipment (or class thereof) manufactured by one manufacturer, and, with respect to electric motors, having (i) the same rating, (ii) electrical design characteristics that are essentially identical, and (iii) no differing mechanical or functional characteristics that affect energy consumption or efficiency.

Rating means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which section 431.42 of 10 CFR Part 431 prescribes nominal full load efficiency standards.

ADDITIONAL MODELS ACTUALLY TESTED

Rating of electric motor			Least efficient basic model (model number(s))	Average full load efficiency
Motor power output (e.g. 1 hp or .75 kW)	Number of poles	Open or enclosed motor		
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
etc	etc	etc	etc	etc

Appendix B to Subpart G of Part 431— Sampling Plan for Enforcement Testing

Step 1. The first sample size (n₁) must be five or more units.

Step 2. Compute the mean (\bar{X}_1) of the measured energy performance of the n₁ units in the first sample as follows:

$$\bar{X}_1 = \frac{1}{n_1} \sum_{i=1}^{n_1} X_i, \quad (1)$$

where X_i is the measured full load efficiency of unit i.

Step 3. Compute the sample standard deviation (S₁) of the measured full load

efficiency of the n₁ units in the first sample as follows:

$$S_1 = \sqrt{\frac{\sum_{i=1}^{n_1} (X_i - \bar{X}_1)^2}{n_1 - 1}}. \quad (2)$$

Step 4. Compute the standard error (SE(\bar{X}_1)) of the mean full load efficiency of the first sample as follows:

$$SE(\bar{X}_1) = \frac{S_1}{\sqrt{n_1}}. \quad (3)$$

Step 5. Compute the lower control limit (LCL₁) for the mean of the first sample using the applicable statutory full load efficiency (SFE) as the desired mean as follows:

$$LCL_1 = SFE - tSE(\bar{X}_1). \quad (4)$$

Here t is 10th percentile of a t-distribution for a sample size of n₁ and yields a 90 percent confidence level for a one-tailed t-test.

Step 6. Compare the mean of the first sample (\bar{X}_1) with the lower control limit (LCL₁) to determine one of the following:

(i) If the mean of the first sample is below the lower control limit, then the basic model is in noncompliance and testing is at an end.

(ii) If the mean is equal to or greater than the lower control limit, no final determination of compliance or noncompliance can be made; proceed to Step 7.

Step 7. Determine the recommended sample size (n) as follows:

$$n = \left[\frac{tS_1(120 - 0.2SFE)}{SFE(20 - 0.2SFE)} \right]^2, \quad (5)$$

where S_1 and t have the values used in Steps 4 and 5, respectively. The factor

$$\frac{(120 - 0.2SFE)}{SFE(20 - 0.2SFE)}$$

is based on a 20 percent tolerance in the total power loss at full load.

Given the value of n , determine one of the following:

(i) If the value of n is less than or equal to n_1 and if the mean energy efficiency of the first sample (\bar{X}_1) is equal to or greater than the lower control limit (LCL_1), the basic model is in compliance and testing is at an end.

(ii) If the value of n is greater than n_1 , the basic model is in noncompliance. The size of a second sample n_2 is determined to be the smallest integer equal to or greater than the difference $n - n_1$. If the value of n_2 so calculated is greater than $20 - n_1$, set n_2 equal to $20 - n_1$.

Step 8. Compute the combined mean (\bar{X}_2) of the measured energy performance of the n_1 and n_2 units of the combined first and second samples as follows:

$$\bar{X}_2 = \frac{1}{n_1 + n_2} \sum_{i=1}^{n_1+n_2} X_i. \quad (6)$$

Step 9. Compute the standard error ($SE(\bar{X}_2)$) of the mean full load efficiency of the n_1 and n_2 units in the combined first and second samples as follows:

$$SE(\bar{X}_2) = \frac{S_1}{\sqrt{n_1 + n_2}}. \quad (7)$$

(Note that S_1 is the value obtained above in Step 3.)

Step 10. Set the lower control limit (LCL_2) to,

$$LCL_2 = SFE - tSE(\bar{X}_2) \quad (8)$$

and compare the combined sample mean (\bar{X}_2) to the lower control limit (LCL_2) to find one of the following:

(i) If the mean of the combined sample (\bar{X}_2) is less than the lower control limit (LCL_2), the basic model is in noncompliance and testing is at an end.

(ii) If the mean of the combined sample (\bar{X}_2) is equal to or greater than the lower control limit (LCL_2), the basic model is in compliance and testing is at an end.

MANUFACTURER-OPTION TESTING

If a determination of non-compliance is made in Steps 6, 7 or 11, above, the manufacturer may request that additional testing be conducted, in accordance with the following procedures.

Step A. The manufacturer requests that an additional number, n_3 , of units be tested, with n_3 chosen such that $n_1 + n_2 + n_3$ does not exceed 20.

Step B. Compute the mean full load efficiency, standard error, and lower control limit of the new combined sample in accordance with the procedures prescribed in Steps 8, 9, and 10, above.

Step C. Compare the mean performance of the new combined sample to the lower control limit (LCL_2) to determine one of the following:

(a) If the new combined sample mean is equal to or greater than the lower control limit, the basic model is in compliance and testing is at an end.

(b) If the new combined sample mean is less than the lower control limit and the value of $n_1 + n_2 + n_3$ is less than 20, the manufacturer may request that additional units be tested. The total of all units tested may not exceed 20. Steps A, B, and C are then repeated.

(c) Otherwise, the basic model is determined to be in noncompliance.

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