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California Energy Commission
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NEMA COMMENTS ON
CALIFORNIA ENERGY COMMISSION
NOTICE OF PROPOSED ACTION
AMENDMENT TO APPLIANCE EFFICIENCY REGULATIONS
CALIFORNIA CODE OF REGULATIONS, TITLE 20, SECTIONS 1601-1608

NEMA is the leading trade association in the United States representing the interests of electroindustry manufacturers. Founded in 1926 and headquartered near Washington, D.C., its 430 member companies manufacture products used in the generation, transmission and distribution, control, and end-use of electricity, including lighting products. Domestic shipments of electrical products within the NEMA scope exceed $100 billion. Several of NEMA's members manufacture lamps, lamp ballasts, and electric motors, products which are the subject of the Commission's notice of Proposed Action dated December 1, 2006. We request that the Commission consider NEMA's comments below in its standards development process at the full hearing of the Commission on December 20, 2006 any in any further proceeding on this matter.

General Comments

NEMA appreciates the opportunity to comment on the proposed regulations as described in the Commission's Notice of Proposed Action dated December 1, 2006 ("CEC Notice"). NEMA favors high efficiency products because they are good for the public and the economy.

NEMA's comments will address the proposed amendments to the Commission's Appliance Efficiency Regulations insofar as they would amend the regulations applicable to lamps, lamp ballasts, and electric motors. Our comments include the following considerations:

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(i) The establishment of differing compliance or reporting requirements, or timetables that take into account the resources available to business.

(ii) Consolidation or simplification of compliance and reporting requirements for businesses.

(iii) Exemption or partial exemption from the regulatory requirements for businesses.

(iv) Ensuring that the appliance efficiency database has practical value for both the users of the database and the businesses who supply data.

Lamps

NEMA and its members are pleased with the Commission's revisions to Table V, Item K (section 1606(a)). These changes are consistent with federal law and reduce the potential for consumer/purchaser confusion.

We urge the Commission to adopt the proposed revisions with respect to lamps in Table V, Item K. The reporting instructions will have to modified to reflect these changes.

Lamp Ballasts

The US District Court directed the Commission to begin a rulemaking to implement changes described in Appendix A to a Joint Status Conference Statement submitted by Plaintiffs and Defendant. Among those changes, the CEC is to consider whether the data-submittal requirements for ballasts used with T5 or T8 lamps should be modified or eliminated. The Commission's Initial Statement of Reasons posted in connection with the CEC Notice indicates that it was not proposing any revisions at this time but would consider proposed revisions during the rulemaking. NEMA is proposing revisions for the Commission to consider.

(a) <u>Ballasts for Use with T5, T8, and other T12 Lamps</u>

Currently, there are no federal efficiency standards or test requirements for ballasts that drive T5, T8 or T12 fluorescent lamps other than three types of T12 lamps: F40T12, F96T12, and F96T12HO lamps and their corresponding energy saving lamps (F34T12 lamps, F96T12/ES lamps, and F96T12HO/ES lamps added in EPAct 2005). The CEC's appliance regulations apply to fluorescent lamp ballasts that are "designed to . . .(3) be used with T5, T8, or T12 lamps." Section 1601(j). The database as currently configured is designed to require information about non-federally regulated ballasts. Under the heading "Type of Lamp" in Section 1606, Table V, Item J, the possible

answers include three specific types of T12 fluorescent lamps for which there are federal ballast efficacy standards, and there is also a reference to "other T12, T5, T8, and other (specify)" for which there are no federal standards or test requirements.

By adding T5, T8 and other T12 lamps to the scope of the Commission's Appliance Efficiency Regulations, there is an added test burden on manufacturers that California is uniquely imposing on lamp ballast manufacturers. NEMA requests that the Commission make the scope of its lamp ballast regulations synchronous with the scope of federal regulation. Furthermore, by eliminating reporting of T8 lamps, it also avoids the problems with the configuration of the database as explained in Section (b) of our comments below. The database in Section 1606, Table V as configured works fine for the federally-regulated ballasts; it would not work for the state regulated ballasts. Alternatively, NEMA requests, if the scope of the Commission's regulations are to remain unchanged, that the effective date for reporting and certifying with respect to state regulated ballasts be extended to June 29, 2007. We feel this is necessary for both NEMA members and non-NEMA members who manufacture lamp ballasts, as we believe that manufacturers will not be able to achieve compliance by March 12, 2007. We also believe that it is in the Commission's interest that its database be workable for these state-regulated ballasts, and to accommodate necessary changes in the configuration of the database for state regulated ballasts.

If this proposal is accepted, Section 1606, Table V, Item J would be modified as follows:

	Appliance	***Required Information***	***Permissible Answers***
J	Fluorescent lamp ballasts	*Ballast Input Voltage	120, 277, other (specify)
		*Number of Lamps	
		*Type of Lamp	F40T12, F96T12, F96T12HO **[delete T5, T8, other]**
		Designed for Dimming	Continuous, stepped, no
		Designed for Dimming to 50% or Less of Maximum Output	Continuous, stepped, no
		Power Factor	
		Building Application	Designed but not labeled for use only in residential buildings, designed and labeled for use only in residential buildings, other
		Designed for Use in Ambient Temperatures of < 0° F	Yes, no
		Designed for Use (a) at Ambient Temperatures < - 20° F and (b) in an Outdoor Sign (for models with two F96T12HO lamps only)	Yes, no
		Replacement Ballast as Defined in Section 1602(j)	Yes, no
		Total Nominal Lamp Watts	
		Ballast Efficacy Factor	

		Relative Light Output	
		Circuit Design	Cathode cut-out, electronic, magnetic
		Start	Instant, rapid

(b) State regulated Ballasts that Drive Multiple Lamps

NEMA notes there are electronic ballasts that can operate with a number of different T8 lamp types. For example, a ballast that operates with 11 different T8 lamp combinations can generate 22 different possible answers for the database when one includes data for 120 and 277 volt operations for a single field in the CEC database. Additionally, there are universal ballasts that run on multiple input voltages. The database as configured cannot accept this type of information. Limiting the required data to the regulated T12 lamp types would avoid having to supply data for which the CEC database is not set up to address.

To make the database work for these state-regulated lamp ballasts, the database will need to be changed and special rules for reporting of tests will need to be established. NEMA has separately communicated to CEC staff what the industry thinks these special rules might be, and we encourage further discussion between CEC staff and industry on this subject. If the Commission is to retain regulation of these state-regulated ballasts, the test reporting rules and data submittal requirements would have to be amended in the following manner:

A. Universal ballasts that run on multiple input voltages shall be tested at the highest applicable input voltage for (i) Power Factor, (ii) Relative Light Output, and (iii) Ballast Efficacy Factor.

B. Ballasts that can run multiple lamps shall be tested with the full complement of full wattage [not ES] to arrive at Maximum Input Watts.

C. Ballasts that can run multiple lamps shall be tested with the full complement of the Minimum Wattage lamps that are UL listed for the operation of the particular ballast, arriving at Minimum Input Watts.

D. Ballast Efficacy Factor for ballasts that can run multiple lamp types shall be tested using the full complement of full wattage lamps only.

E. A field will have to be added to the database in Section 1606, Table V, Item J for Minimum Input Watts, where the permitted answer would include an open numeric field for the Minimum Input Watts entry.

F. The field in Section 1606, Table V, Item J currently denominated Total Nominal Lamp Watts be denominated Maximum Input Watts, where the permitted answer would include an open numeric field for the Maximum Input Watts entry.

If this proposal is accepted, Table V, Item J would be modified as follows:

	Appliance	***Required Information***	***Permissible Answers***
J	Fluorescent lamp ballasts	*Ballast Input Voltage	120, 277, other (specify)
		*Number of Lamps	
		*Type of Lamp	F40T12, F96T12, F96T12HO, other T12 (specify), T5, T8, other (specify)
		Designed for Dimming	Continuous, stepped, no
		Designed for Dimming to 50% or Less of Maximum Output	Continuous, stepped, no
		Power Factor	
		Building Application	Designed but not labeled for use only in residential buildings, designed and labeled for use only in residential buildings, other
		Designed for Use in Ambient Temperatures of < 0° F	Yes, no
		Designed for Use (a) at Ambient Temperatures < - 20° F and (b) in an Outdoor Sign (for models with two F96T12HO lamps only)	Yes, no
		Replacement Ballast as Defined in Section 1602(j)	Yes, no
		~~Total Nominal Lamp~~ **Maximum Input** Watts	
		Minimum Input Watts	
		Ballast Efficacy Factor	
		Relative Light Output	
		Circuit Design	Cathode cut-out, electronic, magnetic
		Start	Instant, rapid

The database reporting instructions would have to be modified accordingly, and NEMA has shared with CEC staff some ideas as to how that would be done.

(c) Dimming Ballasts

NEMA recommends that dimming ballasts be eliminated from the scope of the Appliance Efficiency Regulations because there are no federal test methods applicable to dimming ballasts and if arbitrary test points are adopted it would yield misleading information on dimming ballasts. If the federal test methods are used with a dimming ballast at 100% light output, these values would not give the user of the database an accurate expectation for the power factor, minimum or maximum input wattage, ballast

efficacy factor, or relative light output. Dimming ballasts are used in almost all cases in light output settings at other than 100% light output, and it would be difficult to define exactly which test points should be used. Thus, NEMA believes that including dimming ballasts in the Appliance Efficiency Regulations and the database would be counterproductive to promoting energy efficiency. Even if arbitrary test points were specified, the database is not presently configured to receive the data for them. If the Commission insists on including dimming ballasts within the scope of the Appliance Efficiency Regulations, NEMA requests, so that the users of the database do not have confusing information about dimming ballasts, that manufacturers of dimming ballasts not be required to report data on power factor, minimum and maximum input wattage, ballast efficacy factor, and relative light output.

Electric Motors

The US District Court directed the Commission to begin a rulemaking to implement changes described in Appendix A to a Joint Status Conference Statement submitted by Plaintiffs and Defendant. Among those changes, the CEC is to consider whether data-submittal should be for "models" using the "Motor Master" protocols used by the US Department of Energy; consider how, if at all, data for "one off" or custom models should be submitted.

(a) Basic Model Definition

The Commission proposes to amend the definition of "basic model" at Section 1602(a) for electric motors to conform to the federal definition of the "basic model' at 10 CFR §431.12. This amendment is essential, not only to avoid federal preemption issues, but to avoid imposing an onerous burden on motor manufacturers with no countervailing benefit to the public. NEMA applauds this amendment, and NEMA urges the Commission to adopt the proposed revision of the definition of basic model.

(b) Motor Power Consumption

The Commission proposes to define the term "motor power consumption" at Section 1602(s), because it will now be a field in Table V, Item S in Section 1606. Previously, the term "power consumption" in Table V, Item S was not defined. NEMA agrees that the term needs to be defined, and by this Comment proposes to add greater clarity so there are not multiple interpretations of the term. The Commission proposes to define this term as follows: "'Motor Power Consumption' means the electrical energy over time that must be supplied to a motor to maintain its operation."

In the Commission's Initial Statement of Reasons dated December 1, 2006, it is stated at page 13 that this definition is necessary for consistency with federal standards. NEMA members are not familiar with a federal definition of this term, either in federal regulations, proposed federal regulations, or in the Motor Master + software tool. On the other hand, NEMA members do believe that the Commission's proposed definition is close to what is understood to be a calculation for annual energy use in kilowatt hours in

the Motor Master+ software tool. The formula is as follows: kwh = ((HP * .746)/Nominal Full Load Efficiency)* annual hours of operation.

To clarify how this calculation is made in Motor Master+, it is important to understand who and how data for the calculation is entered in Motor Master+. Motor Master+ is a voluntary program of the US DOE. Manufacturers who contribute data to Motor Master do not supply data for every motor they manufacture. For those motors for which a manufacturer does supply data to Motor Master, the manufacturer enters the data for horsepower and the nominal full load efficiency. *It is the user of the software program (not the manufacturer of the motor) who inputs the annual hours of operation*, and that figure will vary from user to user, application to application. This fact raises an important point for the Commission's database and Table V, Item S in Section 1606 of the Appliance Efficiency Regulations: to avoid inconsistent and noncomparable data in the database, either (a) the number of annual hours of operation has to be standardized and fixed in the Commission's reporting instructions, or (b) the permissible answer should be expressed in kilowatts, leaving out the calculation for annual energy use. If the Commission chooses the former course, NEMA recommends that the annual hours of operation be fixed at 4000 hours for all users and all applications (kwh = ((HP * .746)/Nominal Full Load Efficiency)* 4000 hours of operation. If the latter course is selected, the formula would be: kw = ((HP * .746)/Nominal Full Load Efficiency).

By selecting one of these two options, it will introduce uniformity and clarity to the term Motor Power Consumption. The definition of Motor Power Consumption will likely have to be modified to give it greater clarity based on the choice made.

(c) Model Numbers and the Utility of the Database

The Commission's database for all products regulated (not just motors) is based on reporting data by manufacturer model number. This approach is particularly problematic for motor manufacturers, and it is our recommendation that motor manufacturers not report data by model number but report data for each "basic model" by making three of the fields already in Table V, Item S additional "identifiers"

As the database is presently configured, the Commission can expect the industry to populate it with *in excess of 40,000 models of information*. These would correspond roughly to the models found in manufacturer catalogs. Motor manufacturers can each have between 2000 and 4000 motor models and there are currently sixteen NEMA member companies and additional non-NEMA member companies that we would expect to report data. With so much information in the CEC database, we think the CEC should consider the information overload disutility that is likely to ensue.

There is also an additional problem, which will exacerbate the problem just identified. Motor manufacturers produce and sell a significant number of motors that are built-to-order, one-off, engineered solutions that will have different electrical and/or mechanical characteristics from the closest "model" of motor made by that manufacturer. These special orders can represent between 20% and 40% or more of a manufacturer's

business, so it is not a trivial number. In fact, it is a very large number. Some manufacturers do not assign motor models to these orders and the motor has no model number; other companies do assign a model number to these unique or engineered solutions. No one else may ever order the same engineered solution, and most will never be shipped to California. Inclusion of these motors would conservatively add over a half million entries to the Commission's database. However, this does present a concern to NEMA members if third-parties use the model numbers in the database as a surrogate for approval or a benchmark for issuing rebates where there are products with no model numbers. NEMA members perceive a serious risk of end-user misunderstanding of the database that could be detrimental to the promotion of energy efficiency.

There is a better way, and it is captured by the "basic model" defined at 10 CFR §431.12, and which the Commission now proposes to incorporate in the Appliance Efficiency Regulations. From the CEC's view, a model number (together with manufacturer and brand name) is an "identifier" that conveniently allows them to identify a product and connect that product to energy efficiency data. In the case of electric motors, for the reasons described above, model number is not a convenient identifier. In the case of electric motors, the important additional identifiers are: 1) horsepower, 2) number of poles, and 3) air exchange (open or enclosed). Together with the manufacturer's name, those three identifiers conveniently allow a person to connect that product to energy efficiency data. This database model follows the "basic model" approach of 113 basic models recognized by DOE and it is the way in which motor data is reported to DOE.[1] NEMA would therefore propose that the CEC revise Table V, Item S in its appliance efficiency regulations at Section 1606 as follows:

Table V

	Appliance	**Required Information**	**Permissible Answers**
	All Appliances	*Manufacturer's Name	
		*Brand Name	
		*Model Number **(except electric motors)**	

[1] DOE stated in its Notice of Proposed Rulemaking on November 27, 1996 "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." 61 FR 60440, 60443-44 (1996). DOE added: "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." *Id.* at 60444.

		Regulatory Status	Federally-regulated consumer product, federally-regulated commercial and industrial equipment, not federally-regulated
S	Electric Motors	*Rated Horsepower	
		*Poles	2, 4, 6, 8
		*Air Exchange	Open, enclosed
		Nominal Full Load Efficiency	
		Motor Power Consumption	Using DOE's Motor Master+ protocol
		Motor Voltage	230, 460, both 230 and 460
		Speed[1]	Single, multiple
		Motor Type	(NEMA Design A or NEMA Design B), or IEC Design

* "Identifier" information as described in Section 1606(e).
1 = Voluntary

The fields in this database are the same as those contained in the CEC's 45-day language, although they have been re-ordered to present the key "identifier" information first followed by the key efficiency data. And importantly, motor manufacturers would not be required to put motor model numbers in the database.

What the database would look like, if this proposal is adopted, is shown on the Excel spreadsheet that accompanies this memorandum. Thus, instead of having to report hundreds if not thousands of model numbers, each company would report data for 113 "basic models." The Excel spreadsheet shows the Commission's proposed database on page 1 and shows how NEMA's proposed database would look like on page 2.

In this format, the database would not show the nominal full load efficiency for each configuration of the tens or hundreds of thousands of different motor models manufactured. Within each class of "basic models" of motors, a manufacturer could make up to a few hundred different configurations of motors with varying measures of efficiency. The nominal full load efficiency shown in Table V, Item S would be the efficiency level that every motor made by a given manufacturer within the set of a given "basic model" would equal or exceed.

(d) Motor Type

As presently configured, the CEC Database includes a field for motor type and the permissible answers are NEMA Design A, NEMA Design B, IEC Design N, or other (specify). Given that the "basic model" definition of CFR10 Part 431 is not as granular as a database keyed to manufacturer model numbers, inserting specific design types is no longer sensible. NEMA would propose to either eliminate this field or to limit the

permissible answer to 1) NEMA Design A or NEMA Design B, or 2) IEC Design. This is reflected in the revised Table V, Item S shown above.

CONCLUSION

NEMA's primary interest in submitting these comments is to make the database useful to the public. If there are any questions about these comments, NEMA and its members are available to respond to the Commission's questions.

Respectfully submitted,

Kyle Pitsor

Kyle Pitsor
Vice-President, Government Relations

Attachment: Excel Spreadsheet showing sample motor database.

Action	
Mfg	
Brand	
Model	Current CEC Format-Motors
MotorType	
MotorVoltage	
Speed	
RatedHP	
Motor Power Consumption	
AirExchange	
Poles	
NominalFullLoadEfficPct	
RegulatoryStatus	

NEMA Proposal - Revised Motors format

Action	Mfg	Brand	Model (leave blank)	RatedHP	Poles	AirExchange	NominalFullLoadEfficPct	Motor Power Consumption	MotorVoltage	Speed	RegulatoryStatus	MotorType
				1	4	Enclosed						
				1	6	Enclosed						
				1-1/2	2	Enclosed						
				1-1/2	4	Enclosed						
				1-1/2	6	Enclosed						
				2	2	Enclosed						
				2	4	Enclosed						
				2	6	Enclosed						
				3*	2	Enclosed						
				3	4	Enclosed						
				3	6	Enclosed						
				5*	2	Enclosed						
				5	4	Enclosed						
				5	6	Enclosed						
				7-1/2	2	Enclosed						
				7-1/2*	4	Enclosed						
				7-1/2	6	Enclosed						
				10	2	Enclosed						
				10	4	Enclosed						
				10	6	Enclosed						
				15	2	Enclosed						
				15	4	Enclosed						
				15	6	Enclosed						
				20	2	Enclosed						
				20	4	Enclosed						
				20	6	Enclosed						
				25	2	Enclosed						
				25*	4	Enclosed						
				25	6	Enclosed						
				30	2	Enclosed						
				30	4	Enclosed						

				30	6	Enclosed						
				40	2	Enclosed						
				40	4	Enclosed						
				40*	6	Enclosed						
				50	2	Enclosed						
				50	4	Enclosed						
				50	6	Enclosed						
				60	2	Enclosed						
				60	4	Enclosed						
				60	6	Enclosed						
				75	2	Enclosed						
				75	4	Enclosed						
				75	6	Enclosed						
				100	2	Enclosed						
				100	4	Enclosed						
				100	6	Enclosed						
				125	2	Enclosed						
				125*	4	Enclosed						
				125	6	Enclosed						
				150	2	Enclosed						
				150	4	Enclosed						
				150	6	Enclosed						
				200	2	Enclosed						
				200	4	Enclosed						
				200	6	Enclosed						
				1	4	Open						
				1	6	Open						
				1-1/2	2	Open						
				1-1/2	4	Open						
				1-1/2	6	Open						
				2	2	Open						
				2	4	Open						
				2	6	Open						
				3	2	Open						
				3	4	Open						
				3	6	Open						
				5	2	Open						
				5	4	Open						
				5	6	Open						
				7-1/2	2	Open						
				7-1/2	4	Open						

7-1/2	6	Open
10	2	Open
10*	4	Open
10	6	Open
15	2	Open
15	4	Open
15	6	Open
20	2	Open
20	4	Open
20	6	Open
25	2	Open
25	4	Open
25	6	Open
30	2	Open
30	4	Open
30	6	Open
40	2	Open
40	4	Open
40	6	Open
50	2	Open
50	4	Open
50	6	Open
60	2	Open
60*	4	Open
60	6	Open
75	2	Open
75	4	Open
75	6	Open
100	2	Open
100	4	Open
100	6	Open
125	2	Open
125	4	Open
125	6	Open
150	2	Open
150	4	Open
150	6	Open
200	2	Open
200	4	Open
200	6	Open