Proposed Rules

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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket No. EERE–2009–BT–TP–0004]

RIN 1904–AB94

Energy Conservation Program for Consumer Products: Test Procedures for Residential Central Air Conditioners and Heat Pumps

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

ACTION: Supplemental notice of proposed rulemaking.

SUMMARY: The U.S. Department of Energy (DOE or the Department) proposed amendments to the DOE test procedure for residential central air conditioners and heat pumps in a June 2010 notice of proposed rulemaking (June 2010 NOPR) and in an April 2011 supplemental notice of proposed rulemaking (April 2011 SNOPR). The amendments proposed in this subsequent SNOPR would change the off-mode laboratory test steps and calculation algorithm to determine off-mode power consumption for residential central air conditioners and heat pumps. DOE welcomes written comments from the public on any subject within the scope of this test procedure rulemaking for addressing the off-mode energy consumption of residential central air conditioners and heat pumps.

DATES: DOE will accept comments, data, and other information regarding this supplemental notice of proposed rulemaking (SNOPR) no later than November 23, 2011. See section 0, ''Public Participation,'' of this SNOPR for details.

ADDRESSES: Interested parties may submit comments, identified by docket number EERE–2009–BT–TP–0004 or Regulation Identifier Number (RIN) 1904–AB94, by any of the following methods:

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

2. *E-mail: RCAC-HP-2009-TP-0004@ee.doe.gov.* Include the docket number EERE–2009–BT–TP–0004 and/or RIN 1904–AB94 in the subject line of the message.

3. *Postal Mail:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. If possible, please submit all items on a compact disc (CD), in which case it is not necessary to include printed copies. Otherwise, please submit one signed paper original.

4. *Hand Delivery/Courier:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC 20024. Telephone: (202) 586–2945. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies. Otherwise, please submit one signed paper original.

Instructions: No telefacsimilies (faxes) will be accepted. All submissions must include the docket number or RIN for this rulemaking. For detailed instructions on submitting comments and additional information on the rulemaking process, see section 0, ''Public Participation,'' of this document.

Docket: The docket is available for review at *http://www.regulations.gov*, including **Federal Register** notices, framework documents, public meeting attendee lists and transcripts, comments, and other supporting documents/materials. All documents in the docket are listed in the *http://www.regulations.gov* index. However, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

A link to the docket web page can be found at: *http://www1.eere.energy.gov/buildings/appliance_standards/residential/residential_cac_hp.html.* This web page will contain a link to the docket for this notice on the Web site *http://www.regulations.gov.* The *http://www.regulations.gov* Web page will contain simple instructions on how to access all documents, including public comments, in the docket. See section 0, ''Public Participation,'' for information on how to submit comments through regulations.gov.

For further information on how to submit or review public comments or view hard copies of the docket, contact Ms. Brenda Edwards at (202) 586–2945 or e-mail: *Brenda.Edwards@ee.doe.gov.*

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I. Authority and Background

A. Authority

Title III, Part B of the Energy Policy and Conservation Act of 1975 (EPCA or the Act), Public Law 94–163 (42 U.S.C. 6291–6309, as codified), established the Energy Conservation Program for Consumer Products Other Than Automobiles, a program covering most major household appliances, including the single phrase residential central air conditioners and heat pumps with rated cooling capacities less than 65,000 British thermal units per hour (Btu/h) that are the focus of this notice.[1] (42 U.S.C. 6291(1)–(2), (21) and 6292(a)(3))

Under EPCA, the program consists of four activities: (1) Testing; (2) labeling; and (3) Federal energy conservation standards, and also (4) certification, compliance, and enforcement. The testing requirements consist of test procedures that manufacturers of covered products must use as the basis for certifying to DOE that their products comply with applicable energy conservation standards adopted pursuant to EPCA and for representing the efficiency of those products. (42 U.S.C. 6293(c); 42 U.S.C. 6295(s)) Similarly, DOE must use these test procedures in any enforcement action to determine whether covered products comply with these energy conservation standards. (42 U.S.C. 6295(s)) Under 42 U.S.C. 6293, EPCA sets forth criteria and procedures for DOE's adoption and amendment of such test procedures. Specifically, EPCA provides that an amended test procedure shall produce results which measure the energy efficiency, energy use or estimated annual operating cost of a covered product over an average or representative period of use, and shall not be unduly burdensome to conduct (42 U.S.C. 6293(b)(3)) In addition, if DOE determines that a test procedure amendment is warranted, it must publish proposed test procedures and offer the public an opportunity to present oral and written comments on them. (42 U.S.C. 6293(b)(2)) Finally, in any rulemaking to amend a test procedure, DOE must determine the extent to which the proposed test procedure would change, if at all, the measured efficiency of a system which was tested under the existing test procedure. (42 U.S.C. 6293(e)(1)) If DOE determines that the amended test procedure would alter the measured efficiency of a covered product, DOE must amend the applicable energy conservation standard accordingly. (42 U.S.C. 6293(e)(2)) The amendments proposed in today's SNOPR will not alter the measured efficiency, as represented in the regulating metrics of seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF) of residential central air conditioners and heat pumps. Thus, today's proposed test procedure changes can be adopted without amending the existing standards. (42 U.S.C. 6293(e)(2))

On December 19, 2007, the President signed the Energy Independence and Security Act of 2007 (EISA 2007), Public Law 110–140, which contains numerous amendments to EPCA. Section 310 of EISA 2007 established that the Department's test procedures for all covered products must account for standby mode and off-mode energy consumption. (42 U.S.C. 6295(gg)(2)(A)) Today's SNOPR includes proposals relevant to these statutory provisions.

DOE's existing test procedures for residential central air conditioners and heat pumps adopted pursuant to these provisions appear under Title 10 of the Code of Federal Regulations (CFR) part 430, subpart B, appendix M (''Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps''). These procedures establish the currently permitted means for determining energy efficiency and annual energy consumption of these products.

B. Background

DOE's initial proposals for estimating off-mode energy consumption in the test procedure for residential central air conditioners and heat pumps were shared with the public in a notice of proposed rulemaking published in the **Federal Register** on June 2, 2010 (June 2010 NOPR; 75 FR 31224) and at a public meeting at DOE headquarters in Washington, DC on June 11, 2010. Subsequently, DOE published a supplemental notice of proposed rulemaking (SNOPR) on April 1, 2011 in response to comments received on the June 2010 NOPR, and due to the results of additional laboratory testing conducted by DOE. 76 FR 18105, 18127. DOE received additional comments in response to the April 2011 SNOPR. In today's SNOPR, DOE addresses only those comments not previously addressed in the April 2011 SNOPR that concern off-mode testing of central air conditioners and heat pumps. DOE will subsequently address the remainder of the unrelated comments in response to both the June 2010 NOPR and April 2011 SNOPR in the test procedure final rule.

In the June 2010 NOPR, DOE proposed new laboratory tests and calculation algorithms for determining the off-mode power and off-mode energy consumption of residential central air conditioners and heat pumps, which were subsequently modified in the April 2011 SNOPR. 75 FR 31238–39; 76 FR 18107–09. The off-mode rating reflects those extended times of the year during which a residential central air conditioner or heat pump sits idle. The energy consumed by these products during these extended times is not accounted for by the existing seasonal rating metrics of SEER and HSPF.

One of the extended off-mode intervals was designated the ''shoulder season'' in the June 2010 NOPR. 75 FR 31239. The shoulder season for central air conditioners is defined as the time between the cooling and heating seasons when the unit provides no cooling and when the unit is idle during the entire heating season. The shoulder season for residential heat pumps is defined as the time between the cooling and heating seasons when the unit provides neither heating nor cooling.

The off-mode testing and calculations proposed in the June 2010 NOPR would be used to determine the average power consumption of a residential central air conditioner or heat pump during the shoulder season (represented by the variable *P1*) and, for residential central air conditioners, the unit's average power consumption during the heating season (represented by the variable *P2*). 75 FR at 31238–39. The resulting average power values may then be multiplied by the number of hours assigned to the shoulder and heating seasons to obtain the corresponding off-mode energy values. In the June 2010 NOPR, DOE proposed an approach for assigning the number of hours to the shoulder and heating seasons, as specified in ASHRAE Standard 137–2009. *Id.* For any given location or for each of the six DOE generalized climate

[1] For editorial reasons, upon codification in the U.S. Code, Part B was re-designated Part A.

regions,[2] the sum of the hours in the cooling, heating, and shoulder seasons equals 8,760 hours. See Figures 2 and 3 of 10 CFR part 430, subpart B, appendix M. As proposed in the June 2010 NOPR, annual operating cost calculations would represent operation of a residential central air conditioner or heat pump over a complete 8,760-hour year, not just the cooling season (in the case of a residential central air conditioner) or just the cooling and heating seasons (in the case of a heat pump). Id. at 31238–39.

DOE included off-mode testing and calculations among the issues revisited in the April 2011 SNOPR as a result of comments received from interested parties in response to the originally proposed off-mode tests and calculations, and as a result of information gained from testing conducted by DOE after the close of the public comment period for the June 2010 NOPR. 76 FR at 18107–09. Most of the proposed revisions introduced in the April 2011 SNOPR applied to the laboratory testing of units with compressor crankcase heaters. *Id.* Rather than attempting to formulate a single generic test that would apply to all units with a crankcase heater, DOE proposed multiple product-specific tests. The tests were structured to differentiate between residential central air conditioners and heat pumps, between fixed-output and self-regulating crankcase heaters, between thermostatically controlled and continuously on heater designs, and between local and global thermostatic control options. Id. at 18109.

As explained in the April 2011 SNOPR, ''local'' control refers to cases in which the heater is regulated based on a measured or inferred temperature of the compressor sump. Global control refers to cases in which the heater's operation is regulated based on a measured or inferred temperature that is not influenced by the crankcase heater. *Id.* The most common example of global control is a heater that is powered or unpowered based on the temperature measured by an outdoor air thermostat. *Id.*

Most of the proposed revisions to the off-mode calculations set forth in the April 2011 SNOPR specified which laboratory test to conduct based on system characteristics (*e.g.,* presence of crankcase heater controls). For example, separate off-mode calculations were provided for fixed-output heaters and self-regulating heaters. Id. at 18117–25. Additionally, calculations were proposed to account for use of local control, global control or a combination of local and global control. *Id.* Other calculation changes were proposed to better balance test burden and test rigor. Id. at 18107–08. Specifically, a method to extrapolate test data in lieu of actual testing was proposed for certain crankcase heater controls which would take the longest to physically test. *Id.*

Finally, in light of the need for an overall off-mode rating for residential central air conditioners, DOE introduced an algorithm for weighting the shoulder season off-mode rating, *P1,* with the heating season off-mode rating, *P2.* Id. at 18111. When *P1* and *P2* are weighted based on the national average values for the lengths of the shoulder and heating seasons, the overall off-mode rating is specifically designated by the variable $P_{W,OFF}$. *Id.* The amended off-mode energy conservation standards for central air conditioners are defined in terms of $P_{W,OFF}$ and are set forth in the recently published direct final rule (DFR) for amended energy conservation standards for these products. 76 FR 37408, 37411(June 27, 2011).

Stakeholders raised significant issues and suggested changes to the test procedure proposals set forth in the April 2011 SNOPR, as further described below. Based on these comments and additional laboratory testing conducted by DOE, DOE's position on these topics has evolved. Today's SNOPR shares DOE's current position on the test procedure for residential central air conditioners and heat pumps, and provides interested parties with an additional opportunity to comment on its proposed methodology.

II. Summary of the Proposal

Today's SNOPR revisits the test methods and calculations for off-mode power and energy consumption, which were originally proposed in the June 2010 NOPR and modified in the April 2011 SNOPR. DOE now proposes to revise the off-mode testing procedures and calculation algorithms set forth in the April 2011 SNOPR to shorten the duration and burden of the off-mode testing, while still adequately measuring the off-mode power consumption of the tested residential central air conditioner or heat pump. Specifically, DOE proposes that the applicable test and calculation combination will depend on whether the tested unit is equipped with a crankcase heater and whether or not the crankcase heater operation is controlled by the unit during the test. Furthermore, DOE proposes to alter the calculation for P_{WOFF} that is used to determine the overall off-mode rating for residential central air conditioners and heat pumps.

DOE proposes to make the off-mode test procedure additions in today's SNOPR effective 180 days after publication of the test procedure final rule in the **Federal Register**. By doing so, DOE would not require manufacturers to publish the new rating metrics by this time, but rather, would require that manufacturers use the amended test procedure as of this date only if they wish to make representations of the off-mode energy consumption of their central air conditioners and heat pumps. In addition, DOE proposes to require that the compliance date for these test procedure amendments correspond to the January 1, 2015 compliance date for the amended energy conservation standards for residential central air conditioners and heat pumps. 76 FR 39245.

III. Discussion

This section provides discussion of the revisions and additions to the test procedure that DOE proposes in this SNOPR, based in part on comments DOE received in response to the April 2011 SNOPR. Section 0 describes DOE's proposed changes to test methods and calculations for off-mode power and energy consumption. Additionally, DOE provides the specific proposed revisions to 10 CFR 430, subpart B, appendix M, ''Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps'' as part of this SNOPR.

A. Testing Burden and Complexity

The majority of comments received following publication of the April 2011 SNOPR addressed the revised off-mode testing requirements. In a joint comment, Northwest Energy Efficiency Alliance (NEEA) and Northwest Power Coordinating Council (NPCC) stated that the lack of test data precludes an interested party from evaluating whether the proposed off-mode test method reasonably captures off-mode energy use. (NEEA and NPCC, No. 26 at pp. 2–3) [3] In another joint comment, the Appliance Standards Awareness Project (ASAP), the American Council for an

[2] Each of the regions, which is labeled with Roman numbers from I to VI, is representative of a certain climate zone in the United States and contains the typical season length for the area. Region IV is considered the average and is used for the calculation of ratings.

[3] In the following discussion, comments will be presented along with a notation in the form ''NEEA and NPCC, No. 26 at pp. 2–3,'' which identifies a written comment DOE received and included in the docket of this rulemaking. DOE numbers all comments based on when the comment was submitted in the rulemaking process. This particular notation refers to a comment by (1) By NEEA and NPCC, (2) in document number 26 in this docket, and (3) appearing on pages 2–3.

Energy-Efficient Economy (ACEEE), and the Natural Resources Defense Council (NRDC) encouraged DOE to capture crankcase heater energy consumption in the test procedure with minimal testing burden while providing a means to encourage innovative designs that minimize off-mode energy consumption. (ASAP, ACEEE, and NRDC, No. 27 at pp. 1–2) The California State Investor Owned Utilities (CAIOUs) supported DOE's proposal to account for different types of crankcase heaters and crankcase heater controls. (CAIOUs, No. 23 at p. 1)

Both the American Heating and Refrigeration Institute (AHRI) and Trane stated that the proposed off-mode test procedure is unnecessarily complex. (AHRI, No. 24 at p. 1; Trane, No. 21 at p. 1) AHRI further stated that it does not support DOE's proposed off-mode test procedure because the procedure is too expensive and will not achieve the desired result. (AHRI, No. 24 at p. 1) Trane submitted similar comments, noting that the off-mode proposal will significantly increase testing time, thus adding to the cumulative regulatory burden. (Trane, No. 21 at p. 1) In exploring an alternative to the off-mode test method proposed in the April 2011 SNOPR, AHRI questioned whether the same or similar results could be achieved with minimal testing and/or analysis. (AHRI, No. 24 at p. 1) AHRI went on to offer specific alternatives and modifications to DOE's proposed off-mode test method, including reducing the number of samples tested, using default values to reduce some of the test burden, and adding an alternative set of more component-based off-mode tests (see Section 0). (AHRI, No. 28 at pp. 2, 6–7, and 35–38)

DOE agrees with the joint comment from ASAP, ACEEE and NRDC, and notes that one of the key objectives considered by DOE in amending the test procedure for residential central air conditioners and heat pumps is obtaining a reasonable balance between test burden and off-mode ratings that sufficiently differentiate among products. In response to the comment by NEEA and NPCC regarding insufficient data, DOE conducted additional testing for this SNOPR, which is discussed in detail in section 0, and collected additional data from stakeholders. Based on consideration of comments by AHRI and Trane, as well as results of additional laboratory testing, DOE also concurs that the added complexity and burden resulting from proposed changes in the April 2011 SNOPR would outweigh the benefits of distinguishing among different types of off-mode systems to more specifically capture a unit's off-mode power consumption. Consequently, in today's notice, DOE is proposing additional revisions to the off-mode test procedure to reduce the burden and complexity of testing, while still achieving the intended purpose of accurately measuring off-mode power consumption. The methodology of this revised procedure is discussed in section 0.

B. Individual Component Testing

To reduce the testing burden and complexity, as discussed above, AHRI recommended a component-based testing approach and questioned the amount of testing that should be required to determine off-mode ratings accurately for a product family. (AHRI, No. 28 at pp. 3–50) Specifically, AHRI recommended adding text to the Code of Federal Regulations that would allow off-mode ratings to be obtained in one of two ways: (1) By testing a minimum of two units from each basic model group of a given product family; or (2) by bench testing a minimum of 10 samples of each component that contributes to off-mode energy use (*e.g.,* each type of crankcase heater, each type of controller, etc.) and then using the data obtained to conduct off-mode calculations. With respect to the first option, AHRI pointed out the need to define ''product family'' and offered the following proposed definition: ''any set of basic model groups that have the same (or less) power consumption devices, including but not limited to: control board, crankcase heater, timer(s), switches, etc.'' (AHRI, No. 28 at p. 4) According to AHRI's recommendation, two or more samples would be tested using the full system, off-mode tests specified in the April 2011 SNOPR. DOE believes that the purpose of the AHRI proposal is to identify a single off-mode rating for all central air conditioners or heat pumps of the same product family.

The second AHRI recommendation of testing a minimum of 10 samples of each relevant component would need to be done separately from the complete system testing conducted for determining the SEER and HSPF of a particular unit. AHRI notes that this approach reduces the ''overall testing burden by allowing non-psychometric room testing but yet increase[s] confidence in values by increasing sample size.'' (AHRI, No. 28 at p. 4) According to AHRI, its proposed ''short cut,'' or component-based testing approach, ''may be used for rating products only after the manufacturer verifies a single sample using the appropriate section 3.13 procedure [*i.e.,* the off-mode tests specified in the April 2011 SNOPR] and [that] the *P1* and *P2* values measured via section 3.13 and calculated per section 3.14 [*i.e.,* the AHRI component-based method] are within 10% of each other.'' (AHRI, No. 28 at p. 35) DOE views this approach as a variation of its alternative rating method (ARM) or alternative energy determination method (AEDM) [4] approach used for rating untested split system combinations for SEER and HSPF.

In response to AHRI's proposals, DOE is not considering changes to the definition of product family or, by extension, basic model, at this time. DOE recently clarified its definition of a basic model in its March 2011 certification, compliance, and enforcement final rule. 76 FR 12422 (March 7, 2011) Nonetheless, DOE agrees with AHRI's contention that a manufacturer will need a sample of sufficient size, which is not less than two units, to determine the certified rating for the off-mode energy consumption of a given product. With respect to AHRI's second recommendation of using ARMs to calculate off-mode energy consumption, DOE has an open rulemaking to address many issues associated with alternate methods of determining the efficiency of central air conditioners and heat pumps.[5] DOE plans to address the applicability of ARMs to the off-mode consumption measurement in that rulemaking. While DOE agrees that both of AHRI's recommendations provide potential mechanisms for obtaining off-mode ratings for a manufacturer's complete product line without requiring excessive testing time and does not seek to limit the use of ARMs or AEDMs, DOE believes that its own revised procedure is not unduly burdensome and that there is benefit to conducting off-mode tests in conjunction with the tests for SEER and HSPF. Consequently, DOE is proposing an off-mode test procedure, which is detailed in section 0, and comprises whole system testing, not testing or simulation of individual components.

[4] ARMs are computer simulations used to rate residential central air conditioners or heat pumps in lieu of actual testing to determine the rating. AEDMs accomplish the same purpose as ARMs, but are used for products other than residential central air conditioners and heat pumps and do not require DOE approval prior to use.

[5] See Docket Number EERE–2011–BP–TP–00024 at regulations.gov for more information on the AEDM and ARM rulemaking. A request for information was published in the **Federal Register** on April 18, 2011. 76 FR 21673 (April 18, 2011)

C. Length of Shoulder and Heating Seasons

DOE received several comments regarding DOE's approach proposed in the June 2010 NOPR and repeated in the April 2011 SNOPR for assigning the number of hours to the heating, cooling, and shoulder seasons based on cooling and heating load hour maps. See Figures 2 and 3 from 10 CFR part 430, subpart B, appendix M. NRDC asserted that the cooling load hour distribution is out of date and recommended that new estimates be determined by simulating a reference home built to the 2009 International Energy Conservation Code (IECC).[6] (NRDC, No. 22 at p. 2) CAIOUs recommended that DOE update the season hours using Typical Meteorological Year 3 (TMY3)[7] data from 1952 to 2005, which more accurately reflects current climate conditions. (CAIOUs, No. 23 at p. 2)

The commenters did not further elaborate on how DOE would transition from hourly simulation results to a broader definition of ''seasons;'' did not provide further detail on what specifically would constitute a reference home; and did not elaborate on how DOE should most appropriately use the results of these simulations. Stakeholders also did not provide results from either a previously completed analysis of a 2009 IECC residential building or a revised set of season hours based on TMY3 data that DOE could consider within the time frame of this rulemaking to substantiate stakeholder concerns that the current load distribution is out of date. Finally, there is no assurance that if such a simulation were to be conducted by DOE that the shoulder season hours calculated would meet stakeholder expectations. While DOE acknowledges that a review of the load hour maps is perhaps a useful exercise, DOE does not intend to conduct this analysis during this rulemaking because it believes that its proposed season lengths which are based on the DOE climate regions are adequate to determine typical performance of a tested system.

[6] IECC standards are used to support the design and construction of energy efficient buildings. These standards vary by assigned climate zone, with the country divided into eight climate zones and three climate types (dry, marine, moist). A summary of these standards and map of the climate zones is available at *http://reca-codes.org/pages/iecc2009.html.*

[7] TMY3 refers to a data set of hourly values of solar radiation and meteorological elements for a 1-year period recorded in 1,029 locations. This data set is compiled by the National Renewable Energy Laboratory (NREL) and allows for the simulation of building systems, such as central air conditioners or heat pumps in various locations. See *http://rredc.nrel.gov/solar/old_data/nsrdb/1991–2005/tmy3/* for additional information.

Neither AHRI nor Trane explicitly suggested a method for updating the lengths of seasons, but both disagreed with DOE's definition of shoulder season and opined that the number of hours assigned to the shoulder season was high and needed to be re-evaluated. (AHRI, No. 24 at pp. 1–2; Trane, No. 21 at p. 1) Further, Trane expressed concern that the off-mode hours reflected in the April 2011 SNOPR would be over-representative of several southern climates in particular. (Trane, No. 21 at p. 1) DOE agrees that the shoulder season will vary with climate, but notes that, under EPCA, DOE is not permitted to develop regional off-mode standards. (42 U.S.C. 6295(gg)(3)(B)) Consequently, DOE must develop a ''typical'' profile for allocating the hours in a year to each of the seasons considered.

However, DOE believes that stakeholder concerns regarding the relative length of seasons and consequent over-representation for certain areas have merit. Since EPCA does not allow for regional off-mode standards, DOE is instead proposing a calculation method that is independent of the climate region and bin hours and will instead equally weight the two different power measurements in calculating the off mode metric. This approach is discussed in further detail below.

D. Proposed Test Methods and Calculations for Off-Mode Power and Energy Consumption of Residential Central Air Conditioners and Heat Pumps

Interested parties also provided additional comments on specific elements of the off-mode test method proposed in the April 2011 SNOPR. Both NRDC and CAIOUs expressed their preference that manufacturers be required to report both the central air conditioner's shoulder season off-mode rating, *P1,* and its heating season off-mode rating, *P2,* rather than to report the proposed combined off-mode rating, $P_{w,off.}$ (NRDC, No. 22 at p. 3; CAIOUs, No. 23 at p. 1) AHRI proposed adding definitions for *T00,* the temperature at which the crankcase heater begins to cycle on, and *T100,* the temperature at which the crankcase heater must operate continuously, within the amended Appendix M. (AHRI, No. 28 at p. 10) Trane stated that definitions for *T00* and *T100* should not be expressed in terms of ambient temperature, but rather, in terms of crankcase temperature for those units that are thermostatically controlled. (Trane, No. 21 at p. 1) Because of revisions proposed in today's notice, DOE is no longer planning to use *T00* or *T100,* and therefore does not intend to add definitions for these terms in appendix M. With respect to NRDC's and CAIOUs' comments regarding certification requirements, DOE will consider those issues as part of the regional standards enforcement rulemaking, through which it will address all of the reporting requirements for central air conditioners and heat pumps. Pursuant to EPCA, DOE will begin this rulemaking within 90 days of issuing a final rule for residential central air conditioners and heat pumps. (42 U.S.C. 6295(o)(6)(G)(ii)(I))

Further, both Trane and AHRI questioned the need to consider crankcase heater operation during the shoulder season, which would be represented by the outdoor temperature bins of 57 °F, 62 °F, 67 °F, and 72 °F, according to DOE's proposal. (Trane, No. 21 at p. 1; AHRI, No. 24 at p. 2) AHRI commented that off-mode power consumption at 57 °F should be the only temperature set-point that matters. (AHRI, No. 24 at p. 2) Additionally, Trane and AHRI stated that DOE's proposed requirement for the crankcase heater power measurement to begin five minutes after the end of the compressor run-time will not measure crankcase heater power correctly for heaters that are thermostatically controlled or that use a time delay relay. (Trane, No. 21 at p. 1; AHRI, No. 24 at p. 2)

In response to comments by stakeholders, DOE conducted additional testing on 2 central air conditioners and 3 heat pumps, all of which were one compressor systems. This testing was done to according to the procedure which is proposed in today's notice and complements the prior testing which DOE already conducted. DOE also received off-mode data from AHRI for 80 heat pumps and 44 central air conditioners; 74 of these 124 systems were two-compressor systems. (AHRI, No. 30 at p.1) A summary of AHRI's data, which were produced using the procedure in the April 2011 SNOPR, is contained below in Table 0–1:

TABLE 0–1—AHRI OFF-MODE DATA

	Average P_{WOFF} (W)	Range (W)
Heat Pumps	69	32–103
Central Air Conditioners	122	45–136
Two Compressor Central Air Conditioners and Heat Pumps	120.1	103–136

While DOE appreciates AHRI's effort, DOE is concerned that it cannot determine the types of systems which were used to produce these results and that these results may not be representative of the entire market. No explanation was provided as to why the central air conditioner off-mode average is significantly higher than the heat pump off-mode average. In its submission, AHRI stated that ''systems with P_{WOFF} greater than 100 are very efficient (18–20 SEER) and have two compressors.'' This statement indicates that the average central air conditioner reflected in this data is a high efficiency system with two compressors; DOE does not believe that such systems represent the average central air conditioner in the marketplace. Further, the label on the data submitted by AHRI for the two-compressor systems indicates that the data are representative of both central air conditioners and heat pumps. However, the lower bound of the range is greater than the higher bound of the heat pump range, which suggests that the data only comprise central air conditioners. DOE acknowledges AHRI's concerns, but believes that its own data are more representative of the market and chose to base the analysis on this data.

Additionally, DOE disagrees with Trane and AHRI that crankcase heater operation may not need to be accounted for during the shoulder season. While a crankcase heater with controls may not turn on during the shoulder season, an uncontrolled crankcase heater would run constantly during the shoulder season. Therefore, DOE believes that it is important to consider crankcase heater operation during the shoulder season.

Previously, DOE considered testing at four different temperatures (57 °F, 62 °F, 67 °F, 72 °F), but believes that testing at four temperatures is unnecessary and does not provide sufficient benefit to justify the additional test burden. With four test temperatures, the intermediate points will be equal to either the higher test point or the lower test point, depending on when the crankcase heater turns on (because it is always either on or off). Based on this conclusion and the results of the additional testing, DOE agrees with stakeholder observations regarding test temperatures, and proposes to base the off-mode rating, $P_{W,OFF}$, for units with a cooling capacity of 36,000 Btu/h or less, on an average of wattages, *P1* and *P2,* which are recorded at two different outdoor ambient temperatures: 82 °F for *P1* and 57 °F for *P2.* For systems with crankcase heater controls, the higher temperature set point would measure the off-mode contribution from components other than the crankcase heater, while DOE believes that the lower test point is sufficiently low that the crankcase heater would be energized. However, for systems without a crankcase heater or with an uncontrolled crankcase heater, there would be no difference between measurements taken at the two different temperatures. Consequently, DOE proposes to only test these systems at 82 °F and use this measured value for both *P2* and *P1.*

$$P1 = P1_X - P_X.$$

Where,

$P1_X$ = the overall system power draw at 82 °F, W,

P_X = the power draw at 82 °F of components not associated with the residential central air conditioner or heat pump, W, and

$$P2 = P2_X - P_X.$$

Where,

$P2_X$ = the overall system power draw at 57 °F, W.

P1 and *P2* are then combined to calculate $P_{W,OFF}$:

$$P_{W,OFF} = \frac{P1 + P2}{2}.$$

To address concerns from AHRI and Trane with respect to time delay switches and the potential for inaccurate results due to a thermostat being placed on a warm compressor, DOE proposes to require the manufacturer to specify the presence of these components in the installation manuals, so that the off-mode tests for these systems may be run prior to the tests for SEER and HSPF. Running off-mode tests first would ensure that the time delay switch has not been activated and also that the thermostat will not be influenced by any heat from the compressor because the unit would not have yet been run. For units without these components and for units with time delay switches and for which there is no indication of their presence in their installation manual, the off-mode tests would be done after the steady state 'B' test.[8] DOE seeks comment on its equation for calculating a system's off-mode rating. (See Issue 1 in section 0, ''Issues on Which DOE Seeks Comment'').

[8] As specified in Appendix M of Subpart B to Part 430 of Title 10 in the Code of Federal Regulations, the 'B' test is a steady state test conducted at an outdoor ambient dry bulb inlet temperature of 82 °F and an indoor ambient dry bulb inlet temperature of 80 °F.

1. Provisions for Large Tonnage Systems

For its off-mode analysis, DOE analyzed units with a cooling capacity of three tons (36,000 Btu/h), which is the capacity most representative of units in the marketplace. However, DOE is concerned that larger capacity units have characteristics which could make it more difficult for them to achieve the same standard as those at the representative three-ton capacity. Specifically, DOE believes that larger units may require a larger crankcase heater to ensure safe compressor operation because four- and five-ton units typically have larger compressors as well as larger refrigerant volumes. These two characteristics could necessitate a crankcase heater with a higher power than 40 W crankcase heaters, which DOE observed in units at the representative capacity. Based on further research into system specification sheets and teardown data from the standards rulemaking for these products, DOE believes that larger capacity units require a larger crankcase heater and is now proposing a scaling factor for units at capacities greater than the representative capacity of 36,000 Btu/h. This scaling factor would be directly proportional to the cooling capacity and determined by the following equation:

$$F_{scale} = \frac{Q_C(95)}{36{,}000}.$$

Where,

$Q_c(95)$ = the total cooling capacity at the A or A_2 Test condition. This scaling factor would then be applied to the two power measurements, *P1* and *P2,* to determine $P_{W,OFF}$ as follows:

$$P_{W,OFF} = \frac{(P1 + P2)/2}{F_{scale}}.$$

However, in its analysis DOE also found that units smaller than the representative capacity still required the same components and crankcase heater as units at the representative capacity. DOE does not want to unduly create a market constraint on the manufacture and purchase of smaller central air conditioning systems that otherwise would be right-sized for smaller or more efficient homes by setting an exceedingly stringent off-mode standard. Consequently, DOE is not proposing to apply a scaling factor to units which have a cooling capacity that is less than that of the representative capacity. DOE seeks comment on both the necessity of a scaling factor for large tonnage units, and its approach of making this factor directly proportional to capacity. (See Issue 2 in section 0,

''Issues on Which DOE Seeks Comment'').

2. Special Requirements for Multi-Compressor Systems

DOE is also aware that certain high efficiency residential central air conditioners and heat pumps utilize a two compressor design to provide varying levels of cooling. With different capacity compressors operating at close to full load, the two-compressor unit is able to operate more efficiently and achieve a higher efficiency rating than would be possible with a single compressor. Because there are two compressors in these units, it is likely that the system would have two crankcase heaters (one for each compressor), which would result in higher off-mode power consumption because of the significant effect that crankcase heaters have on a system's off-mode power consumption. However, DOE's analysis for the June 2010 NOPR and the April 2011 SNOPR did not account for this type of unit, and DOE does not want to prevent these high efficiency products from being developed or being made available to the consumer. Therefore, in today's notice, DOE is proposing a method for normalizing the crankcase heater power consumption on a per compressor basis for multi-compressor systems with controlled crankcase heaters using the following equation:

$$P2 = \frac{P2_X - P1_X}{number\ of\ compressors} + P1,$$

Where,

$P1_x$ = overall system measured power draw at 82 °F, W;

$P2_x$ = overall system measured power draw at 57 °F, W.

This equation isolates and averages the power draw associated with the crankcase heaters because, as mentioned previously, DOE believes that units with controlled crankcase heaters would have the crankcase heater off at the *P1* temperature of 82 °F and on at the *P2* temperature of 57 °F. This belief is based on manufacturer interviews during the standards rulemaking, as well as on testing done following the April 2011 SNOPR.

For systems with uncontrolled crankcase heaters, DOE recognizes that there is a need to isolate the crankcase heater power in order to normalize it on a per compressor basis. Multi-compressor systems with controls are likely to have crankcase heaters off during the *P1* test and on during the P2 test, which allows for the first term in the equation above to determine the crankcase heater power. However, in these cases, the *P1* test would yield incorrect results because the power consumption of the components not associated with the residential central air conditioner or heat pump would have to be divided by the number of compressors, while the number of controls does not scale with the number of compressors. Therefore, DOE proposes to require a slightly different approach to determine the off mode power consumption of these systems. In such cases, DOE proposes that, first, the crankcase heater should be disconnected and then the overall system power draw with the disconnected crankcase heater should be recorded as $P1_D$. Next, the average power draw on a per compressor basis should be calculated by dividing the difference between the overall system power draws ($P1_X$ and $P1_D$). Then this difference should be combined with the previously recorded $P1_D$:

$$P1 = \frac{P1_X - P1_D}{number\ of\ compressors} + P1_D,$$

Where,

$P1_D$ = the measured power draw with the crankcase heater disconnected, W.

DOE seeks comment on the use of this equation to calculate an average power draw and for determining the off-mode rating for multiple compressor units. (See Issue 3 in section 0, ''Issues on Which DOE Seeks Comment.'')

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget (OMB) has determined that test procedure rulemakings do not constitute ''significant regulatory actions'' under section 3(f) of Executive Order 12866, Regulatory Planning and Review, 58 FR 51735 (Oct. 4, 1993). Accordingly, this proposed action was not subject to review under the Executive Order by the Office of Information and Regulatory Affairs (OIRA) in the OMB.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires preparation of an initial regulatory flexibility analysis (IRFA) for any rule 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. As required by Executive Order 13272, ''Proper Consideration of Small Entities in Agency Rulemaking,'' 67 FR 53461 (Aug. 16, 2002), DOE published procedures and policies on February 19, 2003, so that the potential impacts of its rules on small entities are properly considered during the rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's Web site: *http://www.gc.doe.gov.*

DOE reviewed today's proposed rule, which would amend the test procedure for residential central air conditioners and heat pumps, under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. DOE tentatively concludes and certifies that the proposed rule, if adopted, would not result in a significant impact on a substantial number of small entities. The factual basis for this certification is set forth below.

For the purpose of the regulatory flexibility analysis for this rule, the DOE adopts the Small Business Administration (SBA) definition of a small entity within this industry as a manufacturing enterprise with 750 employees or fewer. DOE used the small business size standards published on January 31, 1996, as amended, by the SBA to determine whether any small entities would be required to comply with the rule. 61 FR 3280, 3286, as amended at 67 FR 3041, 3045 (Jan. 23, 2002) and at 69 FR 29192, 29203 (May 21, 2004); see also 65 FR 30836, 30850

(May 15, 2000), as amended at 65 FR 53533, 53545 (Sept. 5, 2000). The size standards are codified at 13 CFR part 121. The standards are listed by North American Industry Classification System (NAICS) code and industry description and are available at *http://www.sba.gov/idc/groups/public/documents/sba_homepage/serv_sstd_tablepdf.pdf.*

Residential central air conditioner and heat pump equipment manufacturing is classified under NAICS 333415, ''Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing.'' 70 FR 12395 (March 11, 2005). DOE reviewed AHRI's listing of residential central air conditioner and heat pump product manufacturer members and surveyed the industry to develop a list of domestic manufacturers. As a result of this review, DOE identified 22 manufacturers of residential central air conditioners and heat pumps, of which 15 would be considered small manufacturers with a total of approximately 3 percent of the market sales. DOE seeks comment on its estimate of the number of small entities that may be impacted by the proposed test procedure. (See Issue 4 in section 0, ''Issues on Which DOE Seeks Comment'').

Potential impacts of the proposed test procedure on all manufacturers, including small businesses, come from impacts associated with the cost of proposed additional testing. DOE estimates the incremental cost of the proposed additional tests described in 10 CFR part 430, subpart B, appendix M (proposed section 3.13) to be an increase of $1,000 to $1,500 per unit tested. This estimate is based on private testing services quoted on behalf of DOE in the last two years for residential central air conditioners and heat pumps. Typical costs for running the cooling tests appear to be approximately $5,000. DOE estimated that the additional activities required by the revised test procedure would introduce a 20 to 30 percent increase in testing time, resulting in the additional cost.

Because the incremental cost of running the extra tests is the same for all manufacturers, DOE believes that all manufacturers would incur comparable costs for testing of individual basic models as a result of the proposed test procedure. DOE expects that small manufacturers will incur less testing expense compared with larger manufacturers as a result of the proposed testing requirements because they have fewer basic models and thus require proportionally less testing when compared with large manufacturers that have many basic models. DOE recognizes, however, that smaller manufacturers may have less capital available over which to spread the increased costs of testing.

DOE compared the cost of the testing to the total value added by the manufacturers to determine whether the impact of the proposed test procedure amendments is significant. The value added represents the net economic value that a business creates when it takes manufacturing inputs (*e.g.,* materials) and turns them into manufacturing outputs (*e.g.,* manufactured goods). Specifically, as defined by the U.S. Census, the value added statistic is calculated as the total value of shipments (products manufactured plus receipts for services rendered) minus the cost of materials, supplies, containers, fuel, purchased electricity, and contract work expenses.

DOE analyzed the impact on the smallest manufacturers of residential central air conditioners and heat pumps because these manufacturers would likely be the most vulnerable to cost increases. DOE calculated the additional testing expense as a percentage of the average value added statistic for the five individual firms in the 25 to 49 employee size category in NAICS 333415 as reported by the U.S. Census (U.S. Bureau of the Census, American Factfinder, 2002 Economic Census, Manufacturing, Industry Series, Industry Statistics by Employment Size, *http://factfinder.census.gov/servlet/EconSectorServlet?_lang=en&ds_name=EC0200A1&_SectorId=31&_ts=288639767147*). The average annual value for manufacturers in this size range from the census data was $1.26 million in 2001$, per the 2002 Economic Census, or approximately $1.52 million per year in 2009$ after adjusting for inflation using the implicit price deflator for gross domestic product (U.S. Department of Commerce Bureau of Economic Analysis, *http://www.bea.gov/national/nipaweb/SelectTable.asp*).

DOE also examined the average value added statistic provided by census for all manufacturers with fewer than 500 employees in this NAICS classification as the most representative value from the 2002 Economic Census data of the residential central air conditioner manufacturers with fewer than 750 employees that are considered small businesses by the SBA (15 manufacturers). The average annual value added statistic for all small manufacturers with fewer than 500 employees was $7.88 million (2009$).

Given this data, and assuming the high-end estimate of $1,500 for the additional testing costs, DOE concluded that the additional costs for testing of a single basic model product under the proposed requirements would be approximately 0.1 percent of annual value added for the 5 smallest firms, and approximately 0.02 percent of the average annual value added for all small residential central air conditioner or heat pump manufacturers (15 firms). DOE estimates that testing of basic models may not have to be updated more than once every 5 years, and therefore the average incremental burden of testing one basic model may be one fifth of these values when the cost is spread over several years.

DOE requires that only the highest sales volume split system combinations be laboratory tested. 10 CFR 430.24(m). The majority of residential central air conditioners and heat pumps offered by a manufacturer are typically split systems that are not required to be laboratory tested but can be certified using an alternative rating method that does not require DOE testing of these units. DOE reviewed the available data for five of the smallest manufacturers to estimate the incremental testing cost burden for those small firms that might experience the greatest relative burden from the revised test procedure. These manufacturers had an average of 10 models requiring testing (AHRI Directory of Certified Product Performance, *http://www.ahridirectory.org/ahridirectory/pages/home.aspx*), while large manufacturers will have well over 100 such models. The additional testing cost for final certification for 10 models was estimated at $15,000. Meanwhile, these certifications would be expected to last the product life, estimated to be at least 5 years based on the time frame established in EPCA for DOE review of residential central air conditioner efficiency standards. This test burden is therefore estimated to be approximately 0.2 percent of the estimated 5-year value added for the smallest five manufacturers. DOE believes that these costs are not significant given other, much more significant costs that the small manufacturers of residential central air conditioners and heat pumps incur in the course of doing business. DOE seeks comment on its estimate of the impact of the proposed test procedure amendments on small entities and its conclusion that this impact is not significant. (See Issue 5 in section 0, ''Issues on Which DOE Seeks Comment'').

Accordingly, as stated above, DOE tentatively concludes and certifies that

this proposed rule would not have a significant economic impact on a substantial number of small entities. Accordingly, DOE has not prepared an initial regulatory flexibility analysis (IRFA) for this rulemaking. DOE will provide its certification and supporting statement of factual basis to the Chief Counsel for Advocacy of the SBA for review under 5 U.S.C. 605(b).

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of residential central air conditioners and heat pumps must certify to DOE that their product complies with any applicable energy conservation standard. In certifying compliance, manufacturers must test their product according to the DOE test procedure for residential central air conditioners and heat pumps, including any amendments adopted for that test procedure. DOE has proposed regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including residential central air conditioners and heat pumps. 75 FR 56796 (Sept. 16, 2010). The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act of 1995 (PRA). This requirement has been submitted to OMB for approval. Public reporting burden for the certification is estimated to average 20 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

D. Review Under the National Environmental Policy Act of 1969

In this proposed rule, DOE proposes amendments to test procedures that may be used to implement future energy conservation standards for residential central air conditioners and heat pumps. DOE has determined that this rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*). The rule is covered by Categorical Exclusion A5, for rulemakings that interpret or amend an existing rule without changing the environmental effect, as set forth in DOE's NEPA regulations in appendix A to subpart D, 10 CFR part 1021. This rule will not affect the quality or distribution of energy usage and, therefore, will not result in any environmental impacts. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, ''Federalism,'' 64 FR 43255 (Aug. 4, 1999), imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE has examined today's proposed rule and has determined that it does not preempt State law and does not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subjects of today's proposed rule. States can petition DOE for a waiver of such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

With respect to the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, ''Civil Justice Reform,'' 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) Eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort so 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 United States Attorney General (Attorney General). Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, the proposed rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA; Pub. L. 104–4, codified at 2 U.S.C. 1501 *et seq.*) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. For proposed regulatory actions likely to result in a rule that may cause expenditures by State, local, and Tribal governments in the aggregate or by the private sector of $100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish estimates of the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed ''significant intergovernmental mandate'' and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820. (This policy is also available at *http://www.gc.doe.gov.*) Today's proposed rule contains neither an intergovernmental mandate nor a mandate that may result in the expenditure of $100 million or more in any year, so these requirements do not apply.

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

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105–277) requires

Federal agencies to issue a Family Policymaking Assessment for any proposed rule that may affect family well-being. Today's proposed rule would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is unnecessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

DOE has determined, under Executive Order 12630, ''Governmental Actions and Interference with Constitutionally Protected Property Rights,'' 53 FR 8859 (March 15, 1988), that this proposed regulation, if promulgated as a final rule, would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

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

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516, note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. The OMB's guidelines were published in 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). DOE has reviewed today's proposed rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,'' 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OIRA, Office of Management and Budget, a Statement of Energy Effects for any proposed significant energy action. A ''significant energy action'' is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

Today's regulatory action would not have a significant adverse effect on the supply, distribution, or use of energy and, therefore, it is not a significant energy action. Accordingly, DOE has not prepared a Statement of Energy Effects.

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

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–91), DOE must comply with section 32 of the Federal Energy Administration Act of 1974 (Pub. L. 93–275), as amended by the Federal Energy Administration Authorization Act of 1977 (15 U.S.C. 788). Section 32 essentially provides, in relevant part, 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. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the FTC concerning the impact of the commercial or industry standards on competition.

Today's SNOPR does not incorporate testing methods contained in commercial standards.

V. Public Participation

A. Submission of Comments

DOE will accept comments, data, and other information regarding the SNOPR no later than the date provided in the **DATES** section at the beginning of this notice. Interested parties may submit comments using any of the methods described in the **ADDRESSES** section at the beginning of this rulemaking.

Submitting comments via regulations.gov. The *http://www.regulations.gov* webpage will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to regulations.gov information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (CBI)). Comments submitted through regulations.gov cannot be claimed as CBI. Comments received through the Web site will waive any CBI claims for the information submitted. For information on submitting CBI, see the *Confidential Business Information* section.

DOE processes submissions made through regulations.gov before posting them online. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that regulations.gov provides after you have successfully uploaded your comment.

Submitting comments via e-mail, hand delivery, or mail. Comments and documents submitted via email, hand delivery, or mail also will be posted to regulations.gov. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. E-mail submissions are preferred. If you submit via mail or hand delivery, please provide all items on a CD, if feasible. It is not necessary to submit printed copies. No telefacsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, are written in English, and are free of any defects or viruses.

Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 and 500 form letters per PDF, or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked non-confidential with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include: (1) A description of the items; (2) whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known 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) 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.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

B. Issues on Which DOE Seeks Comment

Although comments are welcome on all aspects of this rulemaking, DOE is particularly interested in receiving comments on the following issues:

1. The proposed equation for the calculation of a system's off-mode rating;

2. An appropriate scaling factor to account for larger units requiring a larger crankcase heater due to bigger compressors and larger refrigerant volume;

3. The proposed equation to adjust crankcase heater power draw for systems with multiple compressors;

4. The estimate of the number of small entities that may be impacted by the proposed test procedure;

5. The estimate of the impact of the proposed test procedure amendments on small entities and its conclusion that this impact is not significant.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this SNOPR.

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Household appliances, Imports, Intergovernmental relations, Small businesses.

Issued in Washington, DC, on September 29, 2011.

Kathleen B. Hogan,

Deputy Assistant Secretary for Energy Efficiency, Office of Technology Development, Energy Efficiency and Renewable Energy.

For the reasons set forth in the preamble, DOE proposes to amend part 430 of chapter II, subchapter D, of title 10 of the Code of Federal Regulations, to read as set forth below:

PART 430—ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

1. The authority citation for Part 430 continues to read as follows:

Authority: 42 U.S.C. 6291–6309; 28 U.S.C. 2461 note.

Appendix M [Amended]

2. Appendix M to subpart B of part 430 is amended as follows:

a. In section 1, Definitions, by revising sections 1.13 through 1.51:

b. In section 2, Testing Conditions, by adding paragraph d. in section 2.2.

c. In section 3,Testing Procedures, by:

i. Revising section 3.1;

ii. Adding sections 3.13 through 3.13.4.9.

d. In section 4, Calculations of Seasonal Performance Descriptors, by:

i. Adding sections 4.2.6 through 4.2.6.2.4;

ii. Revising section 4.3.1.

The additions and revisions read as follows:

Appendix M to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps

* * * * *

1.13 Blower coil unit means a residential central air conditioner or heat pump where the indoor-side refrigerant-to-air heat exchanger coil is packaged in the same cabinet as the indoor blower. All single-packaged units are blower coil units; split-system units may be either blower coil units or coil-only units.

1.14 CFR means Code of Federal Regulations.

1.15 Coefficient of Performance (COP) means the ratio of the average rate of space heating delivered to the average rate of electrical energy consumed by the heat pump. These rate quantities must be determined from a single test or, if derived via interpolation, must be tied to a single set of operating conditions. COP is a dimensionless quantity. When determined for a ducted unit tested without an indoor fan installed, COP must include the section 3.7, 3.8, and 3.9.1 default values for the heat output and power input of a fan motor.

1.16 Coil-only unit means a split-system residential central air conditioner or split-system heat pump where the indoor section includes a refrigerant-to-air heat exchanger coil but not a blower (fan). Coil-only units are designed to be installed and used in combination with a furnace or a modular blower.

1.17 Constant-air-volume-rate indoor fan means a fan that varies its operating speed to provide a fixed air-volume-rate from a ducted system.

1.18 Continuously recorded, when referring to a dry bulb measurement, means that the specified temperature must be sampled at regular intervals that are equal to or less than the maximum intervals specified in section 4.3 part ''a'' of ASHRAE Standard 41.1–86 (RA 01). If such dry bulb temperatures are used only for test room control, it means that one samples at regular intervals equal to or less than the maximum intervals specified in section 4.3 part ''b'' of the same ASHRAE Standard. Regarding wet bulb temperature, dew point temperature, or relative humidity measurements, continuously recorded means that the measurements must be made at regular intervals that are equal to or less than 1 minute.

1.19 Cooling load factor (CLF) means the ratio having as its numerator the total cooling delivered during a cyclic operating interval consisting of one ON period and one OFF period. The denominator is the total cooling that would be delivered, given the same ambient conditions, had the unit operated continuously at its steady-state space cooling capacity for the same total time (ON + OFF) interval.

1.20 Crankcase heater includes all devices and mechanisms for intentionally generating heat within and/or around the compressor sump volume to minimize the diluting of the compressor's refrigerant oil by condensed refrigerant.

1.21 Cyclic Test means a test where the unit's compressor is cycled on and off for

specific time intervals. A cyclic test provides half the information needed to calculate a degradation coefficient.

1.22 Damper box means a short section of duct having an air damper that meets the performance requirements of section 2.5.7.

1.23 Degradation coefficient (CD) means a parameter used in calculating the part load factor. The degradation coefficient for cooling is denoted by CDc. The degradation coefficient for heating is denoted by CDh .

1.24 Demand-defrost control system means a system that defrosts the heat pump outdoor coil only when measuring a predetermined degradation of performance. The heat pump's controls monitor one or more parameters that always vary with the amount of frost accumulated on the outdoor coil (e.g., coil to air differential temperature, coil differential air pressure, outdoor fan power or current, optical sensors, etc.) at least once for every ten minutes of compressor ON-time when space heating. One acceptable alternative to the criterion given in the prior sentence is a feedback system that measures the length of the defrost period and adjusts defrost frequency accordingly.[9] In all cases, when the frost parameter(s) reaches a predetermined value, the system initiates a defrost. In a demand-defrost control system, defrosts are terminated based on monitoring a parameter(s) that indicates that frost has been eliminated from the coil.

A demand-defrost control system, which otherwise meets the above requirements, may allow time-initiated defrosts if, and only if, such defrosts occur after 6 hours of compressor operating time.

1.25 Design heating requirement (DHR) predicts the space heating load of a residence when subjected to outdoor design conditions. Estimates for the minimum and maximum DHR are provided for six generalized U.S. climatic regions in section 4.2.

1.26 Dry-coil tests are cooling mode tests where the wet-bulb temperature of the air supplied to the indoor coil is maintained low enough that no condensate forms on this coil.

1.27 Ducted system means an air conditioner or heat pump that is designed to be permanently installed equipment and delivers conditioned air to the indoor space through a duct(s). The air conditioner or heat pump may be either a split system or a single-packaged unit.

1.28 Energy efficiency ratio (EER) means the ratio of the average rate of space cooling delivered to the average rate of electrical energy consumed by the air conditioner or heat pump. These rate quantities must be determined from a single test or, if derived via interpolation, must be tied to a single set of operating conditions. EER is expressed in units of

$$\frac{\frac{Btu}{h}}{W}.$$

When determined for a ducted unit tested without an indoor fan installed, EER must include the section 3.3 and 3.5.1 default values for the heat output and power input of a fan motor.

1.29 Heating load factor (HLF) means the ratio having as its numerator the total heating delivered during a cyclic operating interval consisting of one ON period and one OFF period. The denominator is the total heating that would be delivered, given the same ambient conditions, if the unit operated continuously at its steady-state space heating capacity for the same total time (ON plus OFF) interval.

1.30 Heating seasonal performance factor (HSPF) means the total space heating required during the space heating season, expressed in Btu's, divided by the total electrical energy consumed by the heat pump system during the same season, expressed in watt-hours. The HSPF used to evaluate compliance with the Energy Conservation Standards (see 10 CFR 430.32(c), subpart C) is based on Region IV, the minimum standardized design heating requirement, and the sampling plan stated in 10 CFR 430.24(m), subpart B.

1.31 Heat pump having a heat comfort controller means equipment that regulates the operation of the electric resistance elements to assure that the air temperature leaving the indoor section does not fall below a specified temperature. This specified temperature is usually field adjustable. Heat pumps that actively regulate the rate of electric resistance heating when operating below the balance point (as the result of a second stage call from the thermostat) but do not operate to maintain a minimum delivery temperature are not considered as having a heat comfort controller.

1.32 Mini-split air conditioners and heat pumps means systems that have a single outdoor section and one or more indoor sections. The indoor sections cycle on and off in unison in response to a single indoor thermostat.

1.33 Multiple-split air conditioners and heat pumps means systems that have two or more indoor sections. The indoor sections operate independently and can be used to condition multiple zones in response to multiple indoor thermostats.

1.34 Non-ducted system means an air conditioner or heat pump that is designed to be permanently installed equipment and directly heats or cools air within the conditioned space using one or more indoor coils that are mounted on room walls and/or ceilings. The unit may be of a modular design that allows for combining multiple outdoor coils and compressors to create one overall system. Non-ducted systems covered by this test procedure are all split systems.

1.35 Part-load factor (PLF) means the ratio of the cyclic energy efficiency ratio (coefficient of performance) to the steady-state energy efficiency ratio (coefficient of performance). Evaluate both energy efficiency ratios (coefficients of performance) based on operation at the same ambient conditions.

1.36 Seasonal energy efficiency ratio (SEER) means the total heat removed from the conditioned space during the annual cooling season, expressed in Btu's, divided by the total electrical energy consumed by the air conditioner or heat pump during the same season, expressed in watt-hours. The SEER calculation in section 4.1 of this appendix and the sampling plan stated in 10 CFR 429.16, subpart B are used to evaluate compliance with the Energy Conservation Standards. (See 10 CFR 430.32(c), subpart C.)

1.37 Single-packaged unit means any central air conditioner or heat pump that has all major assemblies enclosed in one cabinet.

1.38 Small-duct, high-velocity system means a system that contains a blower and indoor coil combination that is designed for, and produces, at least 1.2 inches (of water) of external static pressure when operated at the full-loadair volume rate of 220–350 cfm per rated ton of cooling. When applied in the field, small-duct products use high-velocity room outlets (i.e., generally greater than 1000 fpm) having less than 6.0 square inches of free area.

1.39 Split system means any air conditioner or heat pump that has one or more of the major assemblies separated from the others.

1.40 Standard Air means dry air having a mass density of 0.075 lb/ft^3.

1.41 Steady-state test means a test where the test conditions are regulated to remain as constant as possible while the unit operates continuously in the same mode.

1.42 Temperature bin means the 5 °F increments that are used to partition the outdoor dry-bulb temperature ranges of the cooling (≥ 65 °F) and heating (< 65 °F) seasons.

1.43 Test condition tolerance means the maximum permissible difference between the average value of the measured test parameter and the specified test condition.

1.44 Test operating tolerance means the maximum permissible range that a measurement may vary over the specified test interval. The difference between the maximum and minimum sampled values must be less than or equal to the specified test operating tolerance.

1.45 Time adaptive defrost control system is a demand-defrost control system (see definition 1.24) that measures the length of

[9] Systems that vary defrost intervals according to outdoor dry-bulb temperature are not demand defrost systems.

the prior defrost period(s) and uses that information to automatically determine when to initiate the next defrost cycle.

1.46 Time delay switch or relay means, with respect to off-mode testing, a device that controls the crankcase heater and prevents the crankcase heater from turning on until the unit has been off for a specified amount of time.

1.47 Time-temperature defrost control systems initiate or evaluate initiating a defrost cycle only when a predetermined cumulative compressor ON-time is obtained. This predetermined ON-time is generally a fixed value (e.g., 30, 45, 90 minutes) although it may vary based on the measured outdoor dry-bulb temperature. The ON-time counter accumulates if controller measurements (e.g., outdoor temperature, evaporator temperature) indicate that frost formation conditions are present, and it is reset/remains at zero at all other times. In one application of the control scheme, a defrost is initiated whenever the counter time equals the predetermined ON-time. The counter is reset when the defrost cycle is completed.

In a second application of the control scheme, one or more parameters are measured (e.g., air and/or refrigerant temperatures) at the predetermined, cumulative, compressor ON-time. A defrost is initiated only if the measured parameter(s) falls within a predetermined range. The ON-time counter is reset regardless of whether a defrost is initiated. If systems of this second type use cumulative ON-time intervals of 10 minutes or less, then the heat pump may qualify as having a demand defrost control system (see definition 1.24).

1.48 Triple-split system means an air conditioner or heat pump that is composed of three separate components: An outdoor fan coil section, an indoor fan coil section, and an indoor compressor section.

1.49 Two-capacity (or two-stage) compressor means an air conditioner or heat pump that has one of the following:

(1) A two-speed compressor,

(2) Two compressors where only one compressor ever operates at a time,

(3) Two compressors where one compressor (Compressor #1) operates at low loads and both compressors (Compressors #1 and #2) operate at high loads but Compressor #2 never operates alone, or

(4) A compressor that is capable of cylinder or scroll unloading.

For such systems, low capacity means:

(1) Operating at low compressor speed,

(2) Operating the lower capacity compressor,

(3) Operating Compressor #1, or

(4) Operating with the compressor unloaded (e.g., operating one piston of a two piston reciprocating compressor, using a fixed fractional volume of the full scroll, etc.).

For such systems, high capacity means:

(1) Operating at high compressor speed,

(2) Operating the higher capacity compressor,

(3) Operating Compressors #1 and #2, or

(4) Operating with the compressor loaded (e.g., operating both pistons of a two-piston reciprocating compressor, using the full volume of the scroll).

1.50 Two-capacity, northern heat pump means a heat pump that has a factory or field-selectable lock-out feature to prevent space cooling at high-capacity. Two-capacity heat pumps having this feature will typically have two sets of ratings, one with the feature disabled and one with the feature enabled. The indoor coil model number should reflect whether the ratings pertain to the lockout enabled option via the inclusion of an extra identifier, such as ''+LO.'' When testing as a two-capacity, northern heat pump, the lockout feature must remain enabled for all tests.

1.51 Wet-coil test means a test conducted at test conditions that typically cause water vapor to condense on the test unit evaporator coil.

2.2. * * *

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d. When testing coil-only residential central air conditioners and heat pumps, install a toroidal type transformer to power the low-voltage components of the coil-only system. The manufacturer shall designate any additional specification for this transformer. If the manufacturer does not so designate, use a transformer having the following features: a nominal V-amp rating that results in the transformer being loaded from 25 and 90 percent based on the highest power value expected and then confirmed during the off-mode test; designed to operate with a primary input of 230 V, single phase, 60 Hz; and that provides an output voltage that is within the allowed range for each low-voltage component. The power consumption of the lab-added low-voltage transformer, and the components connected to it, must be measured as part of the total system power consumption during the off-mode tests. This total system power for the coil-only unit, however, must then be reduced by the power consumed by the lab-added transformer when no load is connected to it.

* * * * *

3.1 General Requirements. a. If, during the testing process, an equipment set-up adjustment is made that would alter the performance of the unit when conducting an already completed test, then repeat all tests affected by the adjustment. For cyclic tests, instead of maintaining an air volume rate for each airflow nozzle, maintain the static pressure difference or velocity pressure during an ON period at the same pressure difference or velocity pressure as measured during the steady-state test conducted at the same test conditions.

b. Use the testing procedures in this section to collect the data used for calculating:

1. Performance metrics for residential central air conditioners and heat pumps during the cooling season;

2. Performance metrics for heat pumps during the heating season; and

3. Power consumption metric(s) for residential central air conditioners and heat pumps during the off-mode season(s). For residential central air conditioners, the off-mode seasons are the shoulder seasons that separate the cooling and heating seasons and the entire heating season. For residential heat pumps, the shoulder season is the only off-mode season.

* * * * *

3.13 Laboratory testing to determine off-mode average power ratings.

3.13.1 Determine if the residential central air conditioner or heat pump has a compressor crankcase heater (see definition 1.20). If so equipped, determine from the manufacturer if the compressor crankcase heater's on/off operation is regulated or is unregulated, with the heater operating continuously when the compressor is off. Also determine from the manufacturer if the crankcase heater is regulated with a time delay relay (see definition 1.46) or has thermostat sensor located on the compressor shell. Use Table 17 to determine the required test methods based on the presence of a crankcase heater and how it is controlled.

3.13.2 For residential central air conditioners or heat pumps not having a compressor crankcase heater or having a crankcase heating which is unregulated, conduct the following off-mode test.

3.13.2.1 Configure the controls of the residential central air conditioner or heat pump to mimic the operating mode as if connected to a building thermostat that is set to the OFF position. No requirements are placed on the ambient conditions within the indoor and outdoor test rooms. The room conditions are allowed to change for the duration of this particular test.

3.13.2.2 After the controls have been configured, wait at least 2 minutes. Then integrate the power consumption of the residential central air conditioner or heat pump over a 5-minute interval. This integrated power consumption must include the power consumed by the low-voltage transformer and the low-voltage components connected to it. Calculate the average power consumption rate for the integration interval and designate it as *P1x.*

3.13.2.3 Coil-only system (see definition 1.16) power adjustment: Disconnect all low-voltage wiring from the low-voltage transformer and integrate the power consumption of the fully unloaded transformer over a 5-minute interval. Calculate the average power consumption rate for the integration interval and designate it as *P*x.

3.13.2.4 Blower-coil system (see definition 1.13) power adjustment: If tested and rated with a specific furnace or specific modular blower, measure only the power supplied to the furnace or modular blower while idle (*e.g.,* disconnect the low-voltage wiring for the components housed in the residential central air conditioner parts of the system from the transformer) and integrate this power over a 5-minute interval. Calculate the average power consumption of the fully unloaded transformer, idle furnace, or idle modular blower over the integration interval and designate it as *P*x.

3.13.2.5 For both coil-only and blower-coil systems with a single compressor: To calculate *P1,* the off-mode power solely attributable to the residential central air conditioner or heat pump, subtract this average power consumption (*Px*) from the previously calculated overall system average power (*P1x*):

$$P1 = P1_X - P_X.$$

3.13.2.6 For both coil-only and blower-coil systems with multiple compressors: To calculate *P1,* the off-mode power solely attributable to the residential central air conditioner or heat pump at 82 °F, first disconnect the crankcase heater and then record the overall system power draw with the disconnected crankcase heater as $P1_D$. Next, calculate an average power draw on a per compressor basis by dividing the difference between the overall system power draws ($P1_X$ and $P1_D$). Then combine this difference with the previous recorded $P1_D$:

$$P1 = \frac{P1_X - P1_D}{number\ of\ compressors} + P1_D.$$

3.13.2.7 Round *P1* to the nearest integer wattage value and record this rounded value as both *P2* and *P1.* If the resulting *P2* and *P1* are each less than 1 watt, assign each of them the value of zero.

3.13.3 For residential central air conditioners or heat pumps having a compressor crankcase heater whose on/off operation is regulated, but according to the manufacturer does not have either a time delay switch (see definition 1.46) controlling the crankcase heater or a temperature sensor for the crankcase heater located on the compressor shell.

3.13.3.1 Configure the controls of the residential central air conditioner or heat pump to mimic the operating mode as if connected to a building thermostat that is set to the OFF position. Position a lab-added temperature sensor in the air between 2 and 6 inches from the crankcase heater temperature sensor. For this off-mode test and the one that follows at 57 °F, use this lab-added temperature sensor to measure the outdoor dry bulb temperature. Conduct these tests following the steady state 'B' test and maintain an indoor dry bulb temperature of between 75 °F and 85 °F during the off-mode tests.

3.13.3.2 After the controls have been configured, wait at least 2 minutes. Then integrate the power consumption of the residential central air conditioner or heat pump over a 5-minute interval. This integrated power consumption must include the power consumed by the low-voltage transformer and the low-voltage components connected to it. Calculate the average power consumption rate for the integration interval and designate it as $P1_X$.

3.13.3.3 Coil-only system (see definition 1.16) power adjustment: Reduce the overall system off-mode power measurement, *P1x,* by the power supplied to components not part of the residential central air conditioner or heat pump. Disconnect all low-voltage wiring from the low-voltage transformer and integrate the power consumption of the fully unloaded transformer over a 5-minute interval. Calculate the average power consumption rate for the integration interval and designate it as P_X.

3.13.3.4 Blower-coil system (see definition 1.13) power adjustment: If tested and rated with a specific furnace or specific modular blower, measure only the power supplied to the furnace or modular blower while idle (*e.g.,* disconnect the low-voltage wiring for the components housed in the residential central air conditioner parts of the system from the transformer) and integrate this power over a 5-minute interval. Calculate the average power consumption of the fully unloaded transformer, idle furnace, or idle modular blower over the integration interval and designate it as P_X.

3.13.3.5 For both coil-only and blower-coil systems with a single compressor: To calculate *P1,* the off-mode power solely attributable to the residential central air conditioner or heat pump at 82 °F, subtract this average power consumption (P_X) from the previously calculated overall system average power ($P1_X$) and round *P1* to the nearest integer wattage value:

$$P1 = P1_X - P_X.$$

3.13.3.6 Continue to maintain an indoor dry bulb temperature of between 75 °F and 85 °F, but decrease the outdoor temperature until the lab-added temperature sensor achieves an outdoor ambient dry bulb temperature of 57 °F, +/− 2 °F for at least 5 minutes. Then integrate the power consumption of the residential central air conditioner or heat pump over a 5-minute interval. Calculate the average power consumption rate for the integration interval and designate it as *P2.*

3.13.3.7 After the controls have been configured, wait at least 2 minutes. Then integrate the power consumption of the residential central air conditioner or heat pump over a 5-minute interval. This integrated power consumption must include the power consumed by the low-voltage transformer and the low-voltage components connected to it. Calculate the average power consumption rate for the integration interval and designate it as $P2_X$.

3.13.3.8 For both coil-only and blower-coil systems with a single compressor: To calculate *P2,* the off-mode power solely attributable to the residential central air conditioner or heat pump at 57 °F, subtract this average power consumption (P_X) from the previously calculated overall system average power ($P2_X$) and round *P2* to the nearest integer wattage value:

$$P2 = P2_X - P_X.$$

3.13.3.9 For both coil-only and blower-coil systems with multiple compressors: To calculate *P2,* the off-mode power solely attributable to the residential central air conditioner or heat pump at 57 °F, first calculate an average power draw on a per compressor basis by dividing the difference between the overall system power draws ($P1_X$ and $P2_X$). Then combine this value with the previously determined *P1,* and round *P2* to the nearest integer wattage value:

$$P2 = \frac{P2_X - P1_X}{number\ of\ compressors} + P1.$$

3.13.4 For residential central air conditioners or heat pumps having a compressor crankcase heater whose on/off operation is regulated and, according to the manufacturer, has either a time delay switch (see definition 1.46) controlling the crankcase heater or a temperature sensor for the crankcase heater located on the compressor shell.

3.13.4.1 Configure the controls of the residential central air conditioner or heat pump to mimic the operating mode as if connected to a building thermostat that is set to the OFF position. Position a lab-added temperature sensor in the air between 2 and 6 inches from the crankcase heater temperature sensor. For this off-mode test and the one that follows at 57 °F, use this lab-added temperature sensor to measure the outdoor dry bulb temperature. Conduct these tests before any other tests and maintain an indoor dry bulb temperature of between 75 °F and 85 °F during the off-mode tests.

3.13.4.2 After the controls have been configured, wait at least 2 minutes. Then integrate the power consumption of the residential central air conditioner or heat pump over a 5-minute interval. This integrated power consumption must include the power consumed by the low-voltage transformer and the low-voltage components connected to it. Calculate the average power consumption rate for the integration interval and designate it as $P1_X$.

3.13.4.3 Coil-only system (see definition 1.16) power adjustment: Reduce the overall system off-mode power measurement, $P1_X$, by the power supplied to components not part of the residential central air conditioner or heat pump. Disconnect all low-voltage wiring from the low-voltage transformer and integrate the power consumption of the fully unloaded transformer over a 5-minute interval. Calculate the average power consumption rate for the integration interval and designate it as P_X.

3.13.4.4 Blower-coil system (see definition 1.13) power adjustment: If tested and rated with a specific furnace or specific modular blower, measure only the power supplied to the furnace or modular blower while idle (*e.g.,* disconnect the low-voltage wiring for the components housed in the residential central air conditioner parts of the system from the transformer) and integrate this power over a 5-minute interval. Calculate the average power consumption of the fully unloaded transformer, idle furnace, or idle modular blower over the integration interval and designate it as P_X.

3.13.4.5 For both coil-only and blower-coil systems: To calculate *P1,* the off-mode power solely attributable to the residential central air conditioner or heat pump at 82 °F, subtract this average power consumption (P_X) from the previously calculated overall system

average power ($P1_X$) round *P1* to the nearest integer wattage value:

$$P1 = P1_X - P_X.$$

3.13.4.6 Continue to maintain an indoor dry bulb temperature of between 75 °F and 85 °F, but decrease the outdoor temperature until the lab-added temperature sensor achieves an outdoor ambient dry bulb temperature of 57 °F, +/− 2 °F for at least 5 minutes. Then integrate the power consumption of the residential central air conditioner or heat pump over a 5-minute interval. Calculate the average power consumption rate for the integration interval and designate it as *P2.*

3.13.4.7 After the controls have been configured, wait at least 2 minutes. Then integrate the power consumption of the residential central air conditioner or heat pump over a 5-minute interval. This integrated power consumption must include the power consumed by the low-voltage transformer and the low-voltage components connected to it. Calculate the average power consumption rate for the integration interval and designate it as $P2_X$.

3.13.4.8 For both coil-only and blower-coil systems with a single compressor: To calculate *P2,* the off-mode power solely attributable to the residential central air conditioner or heat pump at 57 °F, subtract this average power consumption (P_X) from the previously calculated overall system average power ($P2_X$) and round *P2* to the nearest integer wattage value:

$$P2 = P2_X - P_X.$$

3.13.4.9 For both coil-only and blower-coil systems with multiple compressors: To calculate *P2,* the off-mode power solely attributable to the residential central air conditioner or heat pump at 57 °F, first calculate an average power draw on a per compressor basis by dividing the difference between the overall system power draws ($P1_X$ and $P2_X$). Then combine this with the previously determined *P1,* and round *P2* to the nearest integer wattage value:

$$P2 = \frac{P2_X - P1_X}{number\ of\ compressors} + P1.$$

4. * * *

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4.2.6 Off-mode seasonal power and energy consumption calculations.

4.2.6.1.1 For residential central air conditioners and heat pumps with a cooling capacity of less than 36,000 Btu/h, determine a systems off-mode rating, $P_{W,OFF,}$ by using the following equation:

$$P_{W,OFF} = \frac{P1 + P2}{2}.$$

4.2.6.1.2 For residential central air conditioners and heat pumps with a cooling capacity of greater than 36,000 Btu/h, calculate the capacity scaling factor according to:

$$F_{scale} = \frac{Q_C(95)}{36{,}000}.$$

Where,

$Q_c(95)$ = the total cooling capacity at the A or A_2 Test condition.

Then, average the off-mode power ratings and divide by the scaling factor to determine a system's off-mode rating:

$$P_{W,OFF} = \frac{(P1 + P2)/_2}{F_{scale}}.$$

4.2.6.2.1 For the shoulder seasons. Calculate the off-mode energy consumption for the shoulder season, *E1,* using

$$E1 = P1 \cdot SSH$$

Where *P1* is determined as specified in section 3.13 and the *SSH* are provided in Table 19 for the six generalized climatic regions along with the national average rating values.

TABLE 19—REPRESENTATIVE COOLING AND HEATING LOAD HOURS AND THE CORRESPONDING SET OF SEASONAL HOURS FOR EACH GENERALIZED CLIMATIC REGION

Climatic region	Cooling load hours CLH_R	Heating load hours HLH_R	Cooling season hours CSH_R	Heating season hours HSH_R	Shoulder season hours SSH_R
I	2400	750	6731	1826	203
II	1800	1250	5048	3148	564
III	1200	1750	3365	4453	942
IV	800	2250	2244	5643	873
Rating Values	1000	2080	2805	5216	739
V	400	2750	1122	6956	682
VI	200	2750	561	6258	1941

4.2.6.2.2 For the heating season—residential central air conditioners only. Calculate the off-mode energy consumption of a residential central air conditioner during the heating season, *E2,* using

$$E2 = P2 \cdot HSH$$

Where *P1* is determined as specified in section 4.2.6.2 and the HSH are provided in Table 19 for the six generalized climatic regions along with the national average rating values.

4.2.6.2.3 For residential central air conditioners only. Calculate the annual off-mode energy consumption of a residential central air conditioner $E_{TOTAL,}$ using

$$E_{TOTAL} = E1 + E2.$$

4.2.6.2.4 For residential heat pumps only, the annual off-mode energy consumption of a residential central air conditioner E_{TOTAL} equals *E1.*

* * * * *

4.3.1 Calculation of actual regional annual performance factors (APF_A) for a particular location and for each standardized design heating requirement.

$$APF_A = \frac{CLH_A \cdot \dot{Q}_c^k(95) + HLH_A \cdot DHR \cdot C}{\frac{CLH_A \cdot \dot{Q}_c^k(95)}{SEER} + \frac{HLH_A \cdot DHR \cdot C}{HSPF} + P1 \cdot SSH + P2 \cdot HSH}$$

Where,

CLH_A = the actual cooling hours for a particular location as determined using the map given in Figure 3, hr;

$\dot{Q}_c^k(95)$ =

the space cooling capacity of the unit as determined from the A or A_2 Test, whichever applies, Btu/h;

HLH_A = the actual heating hours for a particular location as determined using the map given in Figure 2, hr;

DHR = the design heating requirement used in determining the HSPF; refer to section 4.2 and definition 1.22, Btu/h;

C = defined in section 4.2 following Equation 4.2–2, dimensionless;

SEER = the seasonal energy efficiency ratio calculated as specified in section 4.1, Btu/W·h;

HSPF = the heating seasonal performance factor calculated as specified in section 4.2 for the generalized climatic region that includes the particular location of interest (see Figure 2), Btu/W·h. The HSPF should correspond to the actual design heating requirement (DHR), if known. If it does not, it may correspond to one of the standardized design heating requirements referenced in section 4.2;

P1 = the off-mode power consumption taken at 82 °F, as determined in section 3.13, W, and

P2 = the off-mode power consumption taken at 57 °F, as determined in section 3.13, W.

Evaluate the *HSH* using

$$HSH = \frac{HLH \cdot (65 - T_{OD})}{\sum_{j=1}^{J}(65 - T_j) \cdot \frac{n_j}{N}}$$

Where T_{OD} and n_j/N are listed in Table 19 and depend on the location of interest relative to Figure 2. For the six generalized climatic regions, this equation simplifies to the following set of equations:

Region I $HSH = 2.4348 \times HLH$
Region II $HSH = 2.5182 \times HLH$
Region III $HSH = 2.5444 \times HLH$
Region IV $HSH = 2.5078 \times HLH$
Region V $HSH = 2.5295 \times HLH$
Region VI $HSH = 2.2757 \times HLH$

Evaluate the shoulder season hours using

$$SSH = 8760 - (CSH + HSH)$$

Where,

CSH = the cooling season hours calculated using $CSH = 2.8045 \times CLH$.

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DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket Number EERE–2010–BT–TP–0023]

RIN 1904–AC26

Energy Conservation Program: Test Procedures for Microwave Ovens

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

ACTION: Request for information.

SUMMARY: The U.S. Department of Energy (DOE) has initiated a test procedure rulemaking to develop active mode testing methodologies for residential microwave ovens. DOE specifically is seeking information, data, and comments regarding representative and repeatable methods for measuring the energy use of microwave-only ovens and combination microwave ovens, including: Food loads representative of consumer use; the repeatability of energy use measurements using different food loads; and consumer usage data on the hours of operation in active mode, standby mode, and off mode for the development of an integrated energy use metric.

DATES: Written comments and information are requested on or before November 23, 2011.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *http://www.regulations.gov.* Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2010–BT–TP–0023 and/or RIN 1904–AC26, by any of the following methods:

- *E-mail: MWO–2010–TP–0023@ee.doe.gov.* Include docket number EERE–2010–BT–TP–0023 and/or RIN 1904–AC26 in the subject line of the message. Submit electronic comments in WordPerfect, Microsoft Word, PDF, or ASCII file format and avoid the use of special characters or any form of encryption.
- *Postal Mail:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. *Telephone:* (202) 586–2945. Please submit one signed original paper copy.
- *Hand Delivery/Courier:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L'Enfant Plaza, SW., 6th Floor, Washington, DC 20024. Please submit one signed original paper copy.

Docket: For access to the docket to read background documents, or comments received, go to the Federal eRulemaking Portal at *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Mr. Wes Anderson, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. *Telephone:* 202–586–7335. *E-mail: Wes.Anderson@ee.doe.gov.*

In the Office of the General Counsel, contact Mr. Ari Altman, U.S. Department of Energy, 1000 Independence Ave., SW., Room 6B–159, Washington, DC 20585. *Telephone:* 202–287–6307; *E-mail: Ari.Altman@hq.doe.gov.*

SUPPLEMENTARY INFORMATION: On July 22, 2010, DOE published in the **Federal Register** a final rule for the microwave oven test procedure rulemaking (July TP repeal final rule), in which it repealed the regulatory provisions for establishing the cooking efficiency test procedure for microwave ovens under the Energy Policy and Conservation Act (EPCA). 75 FR 42579. In the July TP repeal final rule, DOE determined that the existing microwave oven test procedure to measure the cooking efficiency did not produce representative and repeatable test results and was unaware of any test procedures that have been developed that address DOE's concerns with the microwave oven cooking efficiency test procedure. DOE was also unaware of any research or data on consumer usage indicating what a representative food load would be, or any data showing the repeatability of test results. 75 FR 42579, 42581.

On July 22, 2010, DOE also published in the **Federal Register** a notice of public meeting to initiate a separate rulemaking process to consider new provisions for measuring microwave oven energy efficiency in active (cooking) mode. 75 FR 42611. DOE held the public meeting on September 16, 2010 to discuss and receive comments on several issues related to active mode test procedures for microwave ovens to consider in developing a new test procedure. DOE received no data or comments at or after the September 16, 2010 public meeting suggesting potential methodologies for test procedures for microwave oven active mode.

In support of its test procedure rulemaking, DOE conducts in-depth technical analyses of publicly available test standards and other relevant