DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket No. EERE–2008–BT–TP–0010]

RIN 1904–AC02

Energy Conservation Program for Consumer Products: Test Procedures for Clothes Dryers and Room Air Conditioners

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

ACTION: Supplemental notice of proposed rulemaking and public meeting.

SUMMARY: On December 9, 2008, the U.S. Department of Energy (DOE) published a notice of proposed rulemaking (NOPR) in which it proposed amendments to its test procedures for residential clothes dryers and room air conditioners to provide for measurement of standby mode and off mode power use by these products in order to implement recent amendments under the Energy Independence and Security Act of 2007 (EISA 2007) to the Energy Policy and Conservation Act (EPCA). In response to comments on the NOPR, DOE conducted additional investigations to address certain issues raised in these comments. In today's supplemental notice of proposed rulemaking (SNOPR), DOE is continuing to propose amendments to incorporate into its test procedures relevant provisions from the International Electrotechnical Commission (IEC) Standard 62301, "Household electrical appliances—Measurement of standby power," First Edition 2005–06, including language to clarify application of these provisions for measuring standby mode and off mode power consumption in clothes dryers and room air conditioners. In addition, DOE is proposing to adopt definitions of modes based on the relevant provisions from IEC Standard 62301 Second Edition Committee Draft for Vote. DOE is also proposing to amend its test procedures for clothes dryers and room air conditioners to address active mode energy use. Specifically, today's proposal addresses testing methods for clothes dryer automatic cycle termination, vent-less clothes dryers, test cloth preconditioning for clothes dryer energy tests, test conditions for gas clothes dryers, and current clothes dryer usage patterns and capabilities as well as the references in the current room air conditioner and clothes dryer test procedure. DOE will hold a public meeting to discuss and receive comments on the issues presented in this notice.

DATES: DOE will hold a public meeting on Wednesday, July 14, 2010 from 9 a.m. to 4 p.m., in Washington, DC. DOE must receive requests to speak at the public meeting before 4 p.m., Wednesday, July 7, 2010. DOE must receive a signed original and an electronic copy of statements to be given at the public meeting before 4 p.m., Wednesday, July 7, 2010.

DOE will accept comments, data, and information regarding the SNOPR before and after the public meeting, but no later than **August 30, 2010**. *See* section VI, "Public Participation," of this SNOPR for details.

ADDRESSES: The public meeting will be held at the U.S. Department of Energy, Forrestal Building, Room 1E–245, 1000 Independence Avenue, SW., Washington, DC 20585–0121. To attend the public meeting, please notify Ms. Brenda Edwards at (202) 586–2945. (Please note that foreign nationals visiting DOE Headquarters are subject to advance security screening procedures. Any foreign national wishing to participate in the public meeting should advise DOE as soon as possible by contacting Ms. Edwards to initiate the necessary procedures.)

Any comments submitted must identify the SNOPR on Test Procedures for Clothes Dryers and Room Air Conditioners, and provide the docket number EERE–2008–BT–TP–0010 and/or Regulatory Information Number (RIN) 1904–AC02. Comments may be submitted using any of the following methods:

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

2. *E-mail: AHAM2–2008–TP–0010@hq.doe.gov.* Include docket number EERE–2008–BT–TP–0010 and/or RIN 1904–AC02 in the subject line of the message.

3. *Mail:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Please submit one signed paper original.

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. Please submit one signed paper original.

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

Docket: For access to the docket to read background documents or comments received, visit the U.S. Department of Energy, Resource Room of the Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC 20024, (202) 586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Please call Ms. Brenda Edwards at the above telephone number for additional information about visiting the Resource Room.

FOR FURTHER INFORMATION CONTACT: Ms. Margaret Sullivan, 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) 287–1604. *E-mail: Margaret.Sullivan@ee.doe.gov.*

Mr. Francine Pinto, U.S. Department of Energy, Office of the General Counsel, GC–72, 1000 Independence Avenue, SW., Washington, DC 20585–0121. *Telephone:* (202) 586–7432. *E-mail: Francine.Pinto@hq.doe.gov.*

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

SUPPLEMENTARY INFORMATION:

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I. Background and Authority

Title III of the Energy Policy and Conservation Act (42 U.S.C. 6291, *et seq.;* "EPCA" or, in context, "the Act") sets forth a variety of provisions designed to improve energy efficiency. Part A of Title III (42 U.S.C. 6291–6309) establishes the "Energy Conservation Program for Consumer Products Other Than Automobiles," including clothes dryers and room air conditioners (all of which are referred to below as "covered products").[1] (42 U.S.C. 6291(1)–(2) and 6292(a)(2) and (8)).

Under the Act, this program consists essentially of three parts: (1) Testing; (2) labeling; and (3) Federal energy conservation standards. The testing requirements consist of test procedures that, pursuant to EPCA, manufacturers of covered products must use as the basis for certifying to DOE that their products comply with applicable energy conservation standards adopted under EPCA and for representations about the efficiency of those products. Similarly, DOE must use these test requirements to determine whether the products comply with EPCA standards. Under 42 U.S.C. 6293, EPCA sets forth criteria and procedures for DOE's adoption and amendment of such test procedures. EPCA provides that any test procedures prescribed or amended under this section shall be reasonably designed to produce test results which measure energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use, as determined by the Secretary of Energy, 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 thereon, with a comment period no less than 60 days and not to exceed 270 days. (42 U.S.C. 6293(b)(2))

Finally, in any rulemaking to amend a test procedure, DOE must determine to what extent, if any, the proposed test procedure would alter the measured energy efficiency of any covered product as determined 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. In determining the amended energy conservation standard, the Secretary shall measure, pursuant to the amended test procedure, the energy efficiency, energy use, or water use of a representative sample of covered products that minimally comply with the existing standard. The average of such energy efficiency, energy use, or water use levels determined under the amended test procedure shall constitute the amended energy conservation standard for the applicable covered products. (42 U.S.C. 6293(e)(2)) EPCA also states that models of covered products in use before the date on which the amended energy conservation standard becomes effective (or revisions of such models that come into use after such date and have the same energy efficiency, energy use, or water use characteristics) that comply with the energy conservation standard applicable to such covered products on the day before such date shall be deemed to comply with the amended energy conservation standard. (42 U.S.C. 6293(e)(3))

DOE's test procedures for clothes dryers are found at 10 CFR part 430, subpart B, appendix D. DOE established its test procedure for clothes dryers in a final rule published in the **Federal Register** on May 19, 1981. 46 FR 27324. The test procedure includes provisions

[1] All references to EPCA refer to the statute as amended including through the Energy Independence and Security Act of 2007, Public Law 110–140.

for determining the energy factor (EF) for clothes dryers, which is a measure of the total energy required to dry a standard test load of laundry to a "bone dry" [2] state.

DOE's test procedures for room air conditioners are found at 10 CFR part 430, subpart B, appendix F. DOE established its room air conditioner test procedure on June 1, 1977, and redesignated and amended it on June 29, 1979. 42 FR 27898; 44 FR 37938. The existing room air conditioner test procedure incorporates by reference two industry test standards: (1) American National Standard (ANS) (since renamed American National Standards Institute (ANSI)) Z234.1–1972, "Room Air Conditioners;" [3] and (2) American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 16–69, "Method of Testing for Rating Room Air Conditioners." [4] The DOE test procedure includes provisions for determining the energy efficiency ratio (EER) of room air conditioners, which is the ratio of the cooling capacity in British thermal units (Btu) to the power input in watts (W).

As currently drafted, the test procedures for the products at issue in this rulemaking generally do not account for standby mode and off mode energy consumption, except in one narrow product class. Specifically, for gas dryers with continuously burning pilot lights, DOE's current test procedure for clothes dryers addresses the standby energy use of such pilot lights, but otherwise, neither this test procedure nor DOE's test procedure for room air conditioners addresses energy use in the standby or off modes.

The Energy Independence and Security Act of 2007 [5] (EISA 2007) amended EPCA, and in relevant part, directs DOE to amend its test procedures to include measures of standby mode and off mode energy consumption. The EISA 2007 amendments to EPCA further direct DOE to amend the test procedures to integrate such energy consumption into a single energy descriptor for that product. If that is technically infeasible, DOE must prescribe a separate standby mode and off mode energy-use test procedure, if technically feasible. (42 U.S.C. 6295(gg)(2)(A)) Any such amendment must consider the most current versions of the International Electrotechnical Commission (IEC) Standard 62301 ["Household electrical appliances–measurement of standby power," First Edition 2005–06 (IEC Standard 62301)] [6] [7] and IEC Standard 62087 ["Methods of measurement for the power consumption of audio, video, and related equipment," Second Edition 2008–09]. *Id.* For clothes dryers and room air conditioners, DOE must prescribe any such amendment to the test procedures by March 31, 2009. (42 U.S.C. 6295(gg)(2)(B)(ii))

The EISA 2007 amendments to EPCA also provide that amendments to the test procedures to include standby mode and off mode energy consumption will not determine compliance with previously established standards. (U.S.C. 6295(gg)(2)(C)) The test procedure amendments regarding provisions for standby mode and off mode would become effective, in terms of adoption into the CFR, 30 days after the date of publication in the **Federal Register** of the final rule in this test procedures rulemaking. However, DOE is proposing added language to the regulations codified in the CFR that would state that any added procedures and calculations for standby mode and off mode energy consumption resulting from EISA 2007 need not be performed at this time to determine compliance with the current energy conservation standards. Subsequently, manufacturers would be required to use the amended test procedures' standby mode and off mode provisions to demonstrate compliance with DOE's energy conservation standards on the effective date of a final rule establishing amended energy conservation standards for the products that address standby mode and off mode energy consumption, at which time the limiting statement in the DOE test procedure would be removed. Further clarification would also be provided that as of 180 days after publication of a test procedure final rule, any representations as to the standby mode and off mode energy consumption of the products that are the subject of this rulemaking would need to be based upon results generated under the applicable provisions of this test procedure. (42 U.S.C. 6293(c)(2))

On October 9, 2007, DOE published a notice in the **Federal Register** announcing the availability of a framework document to initiate a rulemaking to consider amended energy conservation standards for residential clothes dryers and room air conditioners (hereafter the October 2007 Framework Document). 72 FR 57254. The issuance of a framework document is the first step in conducting an appliance standards rulemaking. In the October 2007 Framework Document, DOE identified specific ways in which it could revise its test procedures for these two products and requested comment from interested parties on whether it should adopt such revisions. Specifically, DOE sought comment on potential amendments to the clothes dryer test procedure to: (1) Reflect lower remaining moisture content (RMC) [8] in clothes loads; (2) account for fewer annual use cycles; and (3) add the capability to test vent-less clothes dryers. (Framework Document, STD No. 1 at pp. 4–6) [9] DOE also received comments in response to the October 2007 Framework Document that it should consider changes to the dryer test load size. For room air conditioners, DOE requested input on potential amendments to the test procedure to: (1) Incorporate the most recent ANSI and ASHRAE test standards; (2) reduce the annual operating hours; and (3) measure part-load performance. (Framework Document, STD No. 1 at pp. 6–7) For room air conditioners, DOE also received comments in response to the October 2007 Framework Document that it should consider changes to the ambient test conditions. Because the October 2007 Framework Document was issued before the enactment of EISA 2007, possible amendments identified at that time for the clothes dryer and room air conditioner test procedures did not address standby mode or off mode energy use.

DOE published a notice of proposed rulemaking (NOPR) on December 9, 2008 (December 2008 TP NOPR), in which it proposed a number of revisions

[2] "Bone dry" is defined in the DOE clothes dryer test procedure as "a condition of a load of test clothes which has been dried in a dryer at maximum temperature for a minimum of 10 minutes, removed and weighed before cool down, and then dried again for 10-minute periods until the final weight change of the load is 1 percent or less." (10 CFR subpart B, appendix D, section 1.2)

[3] ANSI standards are available for purchase at *http://www.ansi.org.*

[4] ASHRAE standards are available for purchase at *http://www.ashrae.org.*

[5] Public Law 110–140 (enacted Dec. 19, 2007).

[6] IEC standards are available for purchase at: *http://www.iec.ch.*

[7] Multiple editions of this standard are referenced in this final rule. Unless otherwise indicated, the terms "IEC Standard 62301" or "IEC Standard 62301 First Edition" refer to "Household electrical appliances–measurement of standby power," First Edition 2005–06.

[8] RMC is the ratio of the weight of water contained by the test load to the bone-dry weight of the test load, expressed as a percent.

[9] A notation in this form provides a reference for information that is in the docket of DOE's rulemaking to develop energy conservation standards for clothes dryers and room air conditioners (Docket No. EERE–2007–BT–STD–0010), which is maintained in the Resource Room of the Building Technologies Program. This notation indicates that the statement preceding the reference was made in DOE's Framework Document, which is document number 1 in the docket for the clothes dryer and room air conditioner energy conservation standards rulemaking, and appears at pages 4–6 of that document.

and additions to its test procedures for clothes dryers and room air conditioners, consisting largely of provisions to address the new statutory requirement to expand test procedures to incorporate a measure of standby mode and off mode energy consumption. 73 FR 74639.

The NOPR was issued on December 2, 2008, although it was formally published on December 9, 2008 (*Id.*), and the proposals in the NOPR were addressed at a public meeting on December 17, 2008 (December 2008 Public Meeting). In addition, DOE invited written comments, data, and information on the December 2008 TP NOPR, and accepted such material through February 23, 2009.

DOE received oral comments from interested parties at the December 2008 Public Meeting and subsequently received four written comments. The principal test procedure issues on which interested parties commented were: (1) The establishment of multiple low power or standby modes for both clothes dryers and room air conditioners; (2) the number of annual hours associated with active, standby, and off modes for the calculation of energy use; (3) the consideration of an additional standby mode (a "network mode"); (4) the potential clarification of the definitions of standby and off mode; (5) the harmonization of mode definitions and testing procedures with the rest of the world, in particular the consideration of IEC Standard 62301 Second Edition, Committee Draft 2 (IEC Standard 62301 CD2); and (6) the potential integration of standby and off mode energy use and active mode energy use into a single energy-use metric.

DOE determined after the December 2008 TP NOPR was published that it would continue the clothes dryer and room air conditioner test procedure rulemaking to allow for consideration of a revised version of IEC Standard 62301, *i.e.,* IEC Standard 62301 Second Edition, which at that time was expected to be published in July 2009. DOE anticipated, based on review of drafts of the updated IEC Standard 62301, that the revisions could include different mode definitions. DOE expected to publish a supplemental notice of proposed rulemaking (SNOPR) for the test procedure rulemaking in which the new mode definitions from the revised IEC Standard 62301 would be considered. However, more recently, DOE received information that IEC Standard 62301 Second Edition would not be published until late 2010, which would not be in time for the consideration of standby and off mode power consumption in the concurrent energy conservation standards rulemaking. DOE, therefore, determined to publish today's SNOPR to consider the new mode definitions from the most recent draft version of IEC Standard 62301 Second Edition, designated as IEC Standard 62301 Second Edition, Committee Draft for Vote (IEC Standard 62301 CDV). DOE noted that the IEC first proposed revisions to IEC Standard 62301 to develop IEC Standard 62301 Second Edition by circulating IEC Standard 62301 Second Edition, Committee Draft 1 on November 16, 2007. IEC subsequently revised the proposed amendments to IEC Standard 62301 and circulated IEC Standard 62301 CD2 on October 17, 2008. Most recently, the IEC again revised the proposed amendments and circulated IEC Standard 62301 CDV on August 28, 2009. IEC Standard 62301 CDV contains the most recent proposed amendments to IEC Standard 62301, including new mode definitions. IEC Standard 62301 CDV revised the proposed mode definitions from those proposed in the previous draft version IEC Standard 62301 CD2 and addresses comments received by interested parties in response to IEC Standard 62301 CD2. DOE, therefore, believes that such new mode definitions represent the best definitions available for the analysis in support of today's SNOPR.

In the December 2008 TP NOPR, DOE's proposal was limited to amendments to its test procedures for clothes dryers and room air conditioners to include methods for measuring standby mode and off mode power consumption. DOE determined after the December 2008 TP NOPR to conduct a rulemaking to address the active mode test procedure issues for clothes dryers and room air conditioners, including those on which it requested comment in the October 2007 Framework Document. Because DOE decided to continue the test procedure rulemaking concerning standby mode and off mode power consumption, DOE intends to address in today's SNOPR the balance of the test procedure issues relating to active mode for clothes dryers and room air conditioners.

Any test procedure amendments regarding the active mode test provisions for clothes dryers and room air conditioners will become effective 30 days after the date of publication in the **Federal Register** of the final rule in this test procedures rulemaking. However, as of 180 days after publication of a test procedure final rule, any representations with respect to the energy use or efficiency or cost of energy consumed of the products that are the subject of this rulemaking would need to be based upon results generated under the applicable provisions of these amended test procedures. (42 U.S.C. 6293(c)(2))

This test procedure rulemaking is anticipated to support a concurrent energy conservation standards rulemaking for residential clothes dryers and room air conditioners. For clothes dryers, the National Appliance Energy Conservation Act of 1987 (NAECA), Public Law 100–12, amended EPCA to establish prescriptive standards for clothes dryers, requiring that gas dryers manufactured on or after January 1, 1988 not be equipped with a constant burning pilot and further requiring that DOE conduct two cycles of rulemakings to determine if more stringent standards are justified. (42 U.S.C. 6295(g)(3) and (4)) On May 14, 1991, DOE published a final rule in the **Federal Register** establishing the first set of performance standards for residential clothes dryers (56 FR 22250); the new standards became effective on May 14, 1994. 10 CFR 430.32(h). DOE initiated a second standards rulemaking for residential clothes dryers by publishing an advance notice of proposed rulemaking (ANOPR) in the **Federal Register** on November 14, 1994. 59 FR 56423. However, pursuant to the priority-setting process outlined in DOE's "Procedures for Consideration of New or Revised Energy Conservation Standards for Consumer Products" (the "Process Rule"),[10] DOE classified the clothes dryer standards rulemaking as a low priority for its fiscal year 1998 priority-setting process. As a result, DOE suspended the standards rulemaking activities for them. DOE has since resumed the rulemaking activities, and has recently initiated the second cycle of clothes dryer standards rulemakings. 72 FR 57254 (October 9, 2007).

NAECA established performance standards for room air conditioners that became effective on January 1, 1990, and directed DOE to conduct two cycles of rulemakings to determine if more stringent standards are justified. (42 U.S.C. 6295(c)(1) and (2)) On March 4, 1994, DOE published a NOPR for several products, including room air conditioners. 59 FR 10464. Because of the Process Rule, DOE suspended activities to finalize standards for room air conditioners. DOE subsequently resumed rulemaking activities related to room air conditioners, and, on September 24, 1997, DOE published a final rule establishing an updated set of performance standards, with an

[10] 61 FR 36974 (July 15, 1996) (*establishing* 10 CFR part 430, subpart C, appendix A).

effective date of October 1, 2000. 62 FR 50122; 10 CFR 40.32(b). Concurrent with the clothes dryer rulemaking, DOE has recently initiated the second cycle of room air conditioner standards rulemakings. 72 FR 57254.

EISA 2007 includes amendments to EPCA that direct DOE to incorporate standby and off mode energy use into any final rule establishing or revising a standard for a covered product adopted after July 1, 2010. (42 U.S.C. 6295(gg)(3)) DOE anticipates publishing the next final rule revising efficiency standards for clothes dryers and room air conditioners by June 30, 2011. Because publication of the final rule revising efficiency standards will fall after July 1, 2010 (the date after which any final rule establishing or revising a standard must incorporate standby and off mode energy use), this final rule must incorporate standby and off mode energy use, thereby necessitating the adoption of relevant standby and off mode provisions into the test procedures for these products.

This test procedure rulemaking will fulfill the seven-year review requirement prescribed by EISA 2007. At least once every 7 years, the Secretary shall review test procedures for all covered products and—amend test procedures with respect to any covered product or publish notice in the **Federal Register** of any determination not to amend a test procedure. (42 U.S.C. 6293(b)(1)(A))

II. Summary of the Proposal

In today's SNOPR, DOE proposes to amend the test procedures for clothes dryers and room air conditioners in order to: (1) Provide a foundation for DOE to develop and implement energy conservation standards that address the energy use of these products when in standby mode and off mode; (2) address the statutory requirement to expand test procedures to incorporate measures of standby mode and off mode power consumption; (3) adopt technical changes and procedures for more accurately measuring the effects of different automatic termination technologies in clothes dryers; (4) expand the clothes dryer test procedures to accommodate vent-less clothes dryers being considered for coverage under an amended energy conservation standard; (5) update detergent specifications for clothes dryer test cloth preconditioning; (6) adopt technical changes to better reflect current usage patterns and capabilities for the covered products; (7) update the references to external test procedures in the DOE room air conditioner and clothes dryer test procedure; and (8) clarify the test conditions for gas clothes dryers. The following paragraphs summarize these proposed changes.

In amending the current test procedures, DOE proposed in the December 2008 TP NOPR to incorporate by reference into both the clothes dryer and room air conditioner test procedures specific clauses from IEC Standard 62301 regarding test conditions and test procedures for measuring standby mode and off mode power consumption. This proposal is not affected by this SNOPR, in which DOE proposes to incorporate into each test procedure the definitions of "active mode," "standby mode," and "off mode" that are based on the definitions provided in the latest draft version of IEC Standard 62301 Second Edition, designated as IEC Standard 62301 CDV. As discussed in section III.B.1, DOE believes that the new mode definitions contained in IEC Standard 62301 CDV represent a substantial improvement over those in IEC Standard 62301 and demonstrate significant participation of interested parties in the development of the best possible definitions. Further, DOE proposes to include in each test procedure additional language that would clarify the application of clauses from IEC Standard 62301 and the mode definitions from IEC Standard 62301 CDV for measuring standby mode and off mode power consumption.[11]

For reasons discussed in section III.B.2 for clothes dryers, DOE is proposing in today's SNOPR a definition and testing procedures for a single standby mode, rather than the multiple standby modes—a general "inactive" mode, a "cycle finished" mode, and a "delay start" mode—that were proposed in the December 2008 TP NOPR. 73 FR 74639, 74645. DOE is also proposing to establish new methods to calculate clothes dryer standby mode and off mode energy use and to adopt a new measure of energy efficiency (Combined Energy Factor (CEF)) that includes energy use in the standby mode and off mode. The proposed amendments regarding standby mode and off mode would not change the method to calculate the existing clothes dryer energy efficiency metric for active mode only, which is the energy factor (EF).

[11] EISA 2007 directs DOE to also consider IEC Standard 62087 when amending its test procedure to include standby mode and off mode energy consumption. *See* 42 U.S.C. 6295(gg)(2)(A). However, IEC Standard 62087 addresses the methods of measuring the power consumption of audio, video, and related equipment. As explained subsequently in this notice, the narrow scope of this particular IEC Standard reduces its relevance to today's proposal.

Similarly, for reasons discussed in section III.B.2 for room air conditioners, DOE is proposing in today's SNOPR a definition and testing procedures for a single standby mode, rather than the multiple standby modes—a general "inactive" mode, a "delay start" mode, and an "off-cycle" mode—as was proposed in the December 2008 TP NOPR. 73 FR 74639, 74645. In the December 2008 TP NOPR, DOE also proposed that standby mode and off mode testing be conducted with room-side air temperature at 74 ± 2 degrees Fahrenheit (°F), with a temperature control setting of 79 °F. 73 FR 74639, 74646. However, upon further consideration, DOE determined that, because the proposed test procedure would be limited to the measurement of a single standby mode and an off mode, the proposed close tolerance on ambient temperature and the proposed temperature setting of 79 °F, which were relevant only for an off-cycle standby mode measurement, would not be required. Therefore, DOE is no longer proposing to include these requirements for testing conditions in today's SNOPR. DOE is also proposing in today's SNOPR new methods to calculate room air conditioner standby mode and off mode energy use and to adopt a new measure of energy efficiency (Combined Energy Efficiency Ratio (CEER)) that includes energy use in the standby mode and the off mode. The proposed amendments regarding standby mode and off mode would not change the method to calculate the existing room air conditioner energy efficiency metric for active mode only, which is the energy efficiency ratio (EER).

Based upon comments from interested parties in response to the October 2007 Framework Document and investigations of international test standards, DOE believes that the benefit of automatic cycle termination should be more accurately credited in its clothes dryer test procedure. Therefore, DOE proposes to revise this test procedure to include definitions of and provisions for testing both timer dryers and automatic termination control dryers using methodology provided in Australia/New Zealand (AS/NZS) Standard 2442.1: 1996, "Performance of household electrical appliances—Rotary clothes dryers, Part 1: Energy consumption and performance" (AS/NZS Standard 2442.1) and AS/NZS Standard 2442.2: 2000, "Performance of household electrical appliances—Rotary clothes dryers, Part 2: Energy labeling requirements" (AS/NZS Standard 2442.2). AS/NZS Standard 2442 is an internationally accepted testing

standard that provides testing methods to account for the over-drying energy consumption associated with both timer dryers and automatic termination control dryers. DOE has evaluated AS/NZS Standard 2442 and determined that it provides an accurate testing methodology for measuring the energy consumption for both timer and automatic termination control dryers while also accounting for over-drying energy consumption. Therefore, DOE is proposing to incorporate the testing methods from these international test standards, along with a number of added clarifications, to measure the energy consumption for both timer dryers and automatic termination control dryers, accounting for the amount of over-drying energy consumption, *i.e.,* the energy consumed by the clothes dryer after the load reaches an RMC of 5 percent. The proposed amendments would provide methods for timer dryers to measure the per-cycle energy consumption required to reach a final RMC of no more than 5 percent, and continuing to apply the effective energy efficiency penalty for timer dryer over-drying energy consumption provided by the fixed field use (FU) factor in the current test procedure. For automatic termination control dryers, the dryer would be tested using an automatic termination setting, allowing the dryer to run until the heater switches off for the final time at the end of the drying cycle, to achieve a final RMC of no more than 5 percent. Any energy consumed once the RMC is less than 5 percent would be considered over-drying. Based on the proposed test methods, an automatic termination control dryer that is able to dry the test load to close to 5-percent RMC, and thus minimize over-drying, will show a higher efficiency than if that same dryer were to over-dry the test load to an RMC less than 5 percent. The energy consumed by over-drying the test load would be included in the per-cycle energy consumption, and would result in a reduction in the measured EF.

As discussed in section III.C.3, DOE intends to analyze potential energy conservation standards for vent-less clothes dryers in a separate rulemaking. Therefore, provisions must be added to the DOE clothes dryer test procedure for measuring the energy efficiency performance in vent-less clothes dryers. DOE is proposing in today's SNOPR to amend the current clothes dryer test procedure to include provisions for testing vent-less clothes dryers based upon the alternate test procedure that DOE previously presented in "Energy Conservation Program for Consumer Products: Publication of the Petition for Waiver and Denial of the Application for Interim Waiver of LG Electronics from the Department of Energy Clothes Dryer Test Procedures." (LG Petition for Waiver) 71 FR 49437 (Aug. 23, 2006). Further, DOE proposes to include in the test procedure additional language based upon provisions from European Standard EN 61121, "Tumble dryers for household use—Methods for measuring the performance," Edition 3 2005 (EN Standard 61121) that would clarify the alternate test procedure presented in the LG Petition for Waiver. EN Standard 61121 is an internationally accepted test standard that provides methods for testing vent-less clothes dryers. The clarifications would require that if a vent-less clothes dryer is equipped with a condensation box (which would store condensed moisture removed from the air exiting the drum until later manual removal by the user), the dryer would be tested with such condensation box installed as specified by the manufacturer. In addition, the clarifications would provide that if the clothes dryer stops the test cycle for the reason that the condensation box is full, the test would not be valid. The clarifications would also require that the condenser heat exchanger not be taken out of the dryer between tests. Finally, the proposed clarifications would address clothes dryer preconditioning for vent-less dryers.

In addition, based upon comments from interested parties in response to the October 2007 Framework Document and data on consumer usage patterns, DOE is proposing to amend the DOE test procedure for clothes dryers to reflect current usage patterns and capabilities. DOE proposes to revise the number of annual use cycles from the 416 cycles per year currently specified by the DOE test procedure, to 283 cycles per year for all types (*i.e.,* product classes) of clothes dryers based on data from the Energy Information Administration (EIA)'s 2005 "Residential Energy Consumption Survey" (RECS) [12] [13] for the number of laundry loads (clothes washer cycles) washed per week and the frequency of clothes dryer use. DOE is also proposing to revise the 70-percent initial RMC required by the test procedure to 47 percent to accurately represent the current condition of laundry loads after a wash cycle, based on shipment-weighted RMC data for clothes washers submitted by the Association of Home Appliance Manufacturers (AHAM) and based on a distribution of RMC values for clothes washer models listed in the December 22, 2008, California Energy Commission (CEC) directory. In addition, DOE is proposing to change the 7-pound (lb) clothes dryer test load size specified by the current test procedure for standard-size clothes dryers to 8.45 lb, based on the historical trends of clothes washer tub volumes and the corresponding percentage increase in clothes washer test load sizes (as specified by the DOE clothes washer test procedure), which is assumed to proportionally impact dryer load sizes. DOE believes most compact clothes dryers are used in conjunction with compact-size clothes washers, and DOE does not have any information to suggest that the tub volume of such clothes washers has changed significantly. Therefore, DOE is not proposing to change the 3-lb test load size currently specified in its clothes dryer test procedure for compact clothes dryers.

For clothes dryers, DOE is also proposing to revise the detergent specifications for test cloth preconditioning due to obsolescence of the detergent specified in the test procedure, to eliminate an unnecessary reference to an obsolete industry clothes dryer test standard, and to amend the provisions in its test procedure which specify test conditions for gas clothes dryers to clarify the required gas supply pressure.

For room air conditioners, based upon comments received on the October 2007 Framework Document, DOE is proposing to update the references in its current room air conditioner test procedure to incorporate the most recent ANSI and ASHRAE test standards—ANSI/AHAM RAC–1–R2008, "Room Air Conditioners," (ANSI/AHAM RAC–1–R2008) and ANSI/ASHRAE Standard 16–1983 (RA 2009) "Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners" (ANSI/ASHRAE Standard 16–1983 (RA 2009)). DOE has also determined that the 750 annual operating hours specified by the current DOE test procedure is representative of current usage patterns, based upon its interpretation of data from the 2005 RECS and, therefore, is not proposing to amend the annual usage hours specified by the current DOE test procedure for room air conditioners.

As noted above in section I, EPCA requires that DOE must determine "to what extent, if any, the proposed test procedure would alter the measured

[12] U.S. Department of Energy—Energy Information Administration. "Residential Energy Consumption Survey," 2005 Public Use Data Files, 2005. Washington, DC. Available online at: *http://www.eia.doe.gov/emeu/recs/.*

[13] EIA's 2005 RECS is the latest available version of this survey.

energy efficiency * * * of any covered product as determined 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 during the rulemaking carried out with respect to such test procedure. In determining the amended energy conservation standard, the Secretary shall measure, pursuant to the amended test procedure, the energy efficiency, energy use, or water use of a representative sample of covered products that minimally comply with the existing standard. (42 U.S.C. 6293(e)(2)) Under 42 U.S.C. 6295(gg)(2)(C), EPCA provides that amendments to the test procedures to include standby mode and off mode energy consumption will not determine compliance with previously established standards. (U.S.C. 6295(gg)(2)(C))

These amended clothes dryer and room air conditioner test procedures would become effective, in terms of adoption into the CFR, 30 days after the date of publication in the **Federal Register** of the final rule in this test procedures rulemaking. Because the proposed amendments to the test procedures for measuring standby mode and off mode energy consumption would not alter the existing measures of energy consumption or efficiency for clothes dryers and room air conditioners, the proposed amendments would not affect a manufacturer's ability to comply with current energy conservation standards. Manufacturers would not be required to use the amended test procedures' standby mode and off mode provisions until the mandatory compliance date of amended clothes dryer and room air conditioner energy conservation standards. All representations related to standby mode and off mode energy consumption of both clothes dryers and room air conditioners made 180 days after the date of publication of the test procedures final rule in the **Federal Register** and before the compliance date of amended energy conservation standards must be based upon the standby and off mode requirements of the amended test procedures. (42 U.S.C. 6293(c)(2))

Furthermore, DOE has investigated how each of the proposed amendments to the active mode provisions in its clothes dryer and room air conditioner test procedures in today's SNOPR would affect the measured efficiency of products. DOE has addressed this requirement for each of the proposed amendments individually in section III.C.

III. Discussion

A. Products Covered by the Test Procedure Changes

Today's proposed amendments to DOE's clothes dryer test procedure cover both electric clothes dryers, which DOE's regulations define to mean a cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air circulation. The heat source is electricity and the drum and blower(s) are driven by an electric motor(s). The amendments also address gas clothes dryers, which DOE defines to mean a cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air circulation. The heat source is gas and the drum and blower(s) are driven by an electric motor(s).

These definitions and the proposed amendments discussed below cover both vented and vent-less clothes dryers, as well as combination washer/dryers.

Today's proposed amendments, to DOE's room air conditioner test procedure, cover a consumer product, other than a "packaged terminal air conditioner," which is powered by a single-phase electric current and which is an encased assembly designed as a unit for mounting in a window or through the wall for the purpose of providing delivery of conditioned air to an enclosed space. It includes a prime source of refrigeration and may include a means for ventilating and heating.

This definition and the proposed amendments discussed below cover room air conditioners designed for single- or double-hung windows with or without louvered sides and with or without reverse cycle, as well as casement-slider and casement-only window-type room air conditioners.

DOE is not proposing in today's SNOPR to change the definitions for clothes dryers and room air conditioners in DOE's regulations.

B. Clothes Dryer and Room Air Conditioner Standby Mode and Off Mode Test Procedures

1. Incorporating by Reference IEC Standard 62301 for Measuring Standby Mode and Off Mode Power in Clothes Dryers and Room Air Conditioners

As noted in the December 2008 TP NOPR, DOE considered, pursuant to EPCA, the most current versions of IEC Standard 62301 and IEC Standard 62087 for measuring power consumption in standby mode and off mode. (42 U.S.C. 6295(gg)(2)(A)) 73 FR 74639, 74643–44 (Dec. 9, 2008). DOE noted that IEC Standard 62087 specifies methods of measuring the power consumption of TV receivers, videocassette recorders (VCRs), set top boxes, audio equipment, and multi-function equipment for consumer use. IEC Standard 62087 does not include measurement for the power consumption of electrical appliances such as clothes dryers and room air conditioners. Therefore, DOE has tentatively determined that IEC Standard 62087 was unsuitable for potential amendments to the clothes dryer and room air conditioner test procedures. 73 FR 74639, 74643 (Dec. 9, 2008). DOE noted that IEC Standard 62301 provides for measuring standby power in electrical appliances, including clothes dryers and room air conditioners, and, thus, is applicable to the proposed amendments to the clothes dryer and room air conditioner test procedures. 73 FR 74643–44 (Dec. 9, 2008).

DOE proposed in the December 2008 TP NOPR to incorporate by reference into the DOE test procedures for clothes dryers and room air conditioners specific clauses from IEC Standard 62301 for measuring standby mode and off mode power: From section 4 ("General conditions for measurements"), paragraph 4.2, "Test room," paragraph 4.4, "Supply voltage waveform," and paragraph 4.5, "Power measurement accuracy," and section 5 ("Measurements"), paragraph 5.1, "General" and paragraph 5.3, "Procedure." DOE also proposed to reference these same provisions in the DOE test procedure for room air conditioners, as well as section 4, paragraph 4.3, "Power supply." 73 FR 74639, 74644 (Dec. 9, 2008).

DOE noted in the December 2008 TP NOPR that the EPCA requirement to consider IEC Standard 62301 in developing amended test procedures for clothes dryers and room air conditioners presented a potential conflict in defining "standby mode." 73 FR 74639, 74644 (Dec. 9, 2008). EPCA defines "standby mode" as the condition in which a product is connected to a main power source and offers one or more of the following user-oriented or protective functions: (1) To facilitate the activation or deactivation of other functions (including active mode) by remote switch (including remote control), internal sensor, or timer; and/or (2) to provide continuous functions, including information or status displays (including clocks) or sensor-based functions. (42 U.S.C. 6295(gg)(1)(A)(iii)). In contrast, paragraph 3.1 of IEC Standard 62301 defines "standby mode" as the "lowest power consumption mode which cannot be switched off

(influenced) by the user and that may persist for an indefinite time when an appliance is connected to the main electricity supply and used in accordance with the manufacturer's instructions." In addition, prior to EISA 2007, DOE adopted a definition for "standby mode" nearly identical to that of IEC Standard 62301 in the dishwasher test procedure, in which "standby mode" "means the lowest power consumption mode which cannot be switched off or influenced by the user and that may persist for an indefinite time when an appliance is connected to the main electricity supply and used in accordance with the manufacturer's instructions." (10 CFR part 430, subpart B, appendix C, section 1.14) While EPCA specifies that DOE may amend the definitions provided under 42 U.S.C. 6295(gg)(1)(A), taking into consideration the most current version of IEC Standard 62301 in updating its test procedure (42 U.S.C. 6295(gg)(1)(B)), DOE proposed in the December 2008 TP NOPR to adopt the broader, statutory definition of "standby mode" provided in EPCA for reasons of greater specificity and clarity among the considered definitions, and to include that definition in the test procedures for clothes dryers and room air conditioners. 73 FR 74639, 74644 (Dec. 9, 2008)

AHAM commented that the definition provided under EPCA, developed in part using IEC Standard 62301 Second Edition, Committee Draft 1, allowed the introduction and definition of "off mode" and it provided additional clarification on standby mode, which is not addressed in IEC Standard 62301. (AHAM, TP No. 10 at p. 2) [14] AHAM also submitted comments to DOE, which AHAM denoted as general application guidelines, to individual appliance committees on the use of IEC Standard 62301 definitions. AHAM stated that the energy mode definitions in its comment are consistent with IEC Standard 62301 and EISA 2007. (AHAM, TP No. 12 at p. 1) For standby mode, AHAM's submission states that this mode may persist for an indefinite period of time and may allow activation of other modes by local or remote switch. AHAM's description of standby mode further specifies that standby mode applies only to products that are not "continuous run" products, which it defines as a product which "is performing in active mode 100 [percent] of time that it is plugged into the main electricity supply." (AHAM, TP No. 12 at p. 2). DOE notes that neither clothes dryers nor room air conditioners would be classified as continuous run products, since both provide modes in which the unit would be plugged in but not operating in active mode. For the reasons discussed below, DOE is revising the test procedure amendments proposed in the December 2008 TP NOPR and is proposing in today's SNOPR mode definitions based on the definitions provided in IEC Standard 62301 CDV. As discussed further in section III.B.3 of this SNOPR, DOE also continues to propose the requirement it proposed in the December 2008 TP NOPR that for clothes dryers or room air conditioners that drop from a higher-power state to a lower-power state, as discussed in Section 5, Paragraph 5.1, note 1 of IEC Standard 62301, sufficient time would be allowed for the unit to reach the lower-power state before proceeding with the test measurement for standby mode and off mode power. 73 FR 74639, 74656, 74658 (Dec. 9, 2008).

In the December 2008 TP NOPR, DOE noted that, while section 325(gg)(2)(A) of EPCA (42 U.S.C. 6295(gg)(2)(A)) requires that the amended test procedures consider the most current version of IEC Standard 62301, the IEC is developing an updated version of this standard, IEC Standard 62301 Second Edition. 73 FR 74639, 74644 (Dec. 9, 2008). This updated version of IEC Standard 62301 is expected to include definitions of "off mode," "network mode," and "disconnected mode," and would revise the current IEC Standard 62301 definition of "standby mode." However, DOE stated in the December 2008 TP NOPR that, because the IEC anticipated that this new version of Standard 62301 would likely be published in July 2009, this later version of the standard would be unavailable in time for DOE to consider it and to still meet the EISA 2007 deadline for issuance of a final rule amending the relevant test procedure to include measures of standby mode and off mode energy consumption by March 31, 2009. *Id.* See 42 U.S.C. 6295(gg)(2)(B)(ii). For this reason, DOE stated in the December 2008 TP NOPR that IEC Standard 62301 would be the "current version" at the time of publication of the final rule, so consideration thereof would comply with EPCA. Accordingly, DOE incorporated sections from IEC Standard 62301 in the proposed amendments to the test procedure in the December 2008 TP NOPR. 73 FR 74639, 74644 (Dec. 9, 2008). DOE also stated in the December 2008 TP NOPR that after the final rule is published, amendments to the referenced standards would be adopted into the DOE test procedure only if DOE later publishes a final rule to incorporate them into its procedures. 73 FR 74644 (Dec. 9, 2008).

AHAM commented that a primary concern is the significant differences between IEC Standard 62301 and IEC Standard 62301 CD2. (AHAM, Public Meeting Transcript, TP No. 8 at p. 17) [15] AHAM supports the use of IEC Standard 62301; however, it also stated that there have been considerable issues and concerns with the current version, including confusion over how to interpret the standard. AHAM noted that IEC Standard 62301 CD2 provides clarifications to IEC Standard 62301, such as further defining standby and off mode to allow for the measurement of multiple standby power modes. However, AHAM also noted that the procedures for setup and testing remain very much the same. (AHAM, Public Meeting Transcript, TP No. 8 at pp. 29–31, 39–40) AHAM questioned whether the clarifications of IEC Standard 62301 CD2, particularly in terms of these mode definitions, could be incorporated into the language in the DOE test procedure if DOE is unable to incorporate the standard directly, and proposed that DOE consider harmonizing with the IEC Standard 62301 CD2 under the expectation that this language will be finalized in IEC Standard 62301 Second Edition. AHAM believes that EISA 2007 could be interpreted to allow IEC Standard 62301 CD2 to be incorporated before it is finalized. (AHAM, Public Meeting Transcript, TP No. 8 at pp. 31–35) Whirlpool Corporation (Whirlpool) and GE Consumer & Industrial (GE) supported AHAMs comments that DOE should harmonize with the rest of the world in considering IEC Standard 62301 CD2. (AHAM, Public Meeting Transcript, TP No. 8 at p. 17; Whirlpool, Public Meeting Transcript, TP No. 8 at p. 36; GE, Public Meeting Transcript, TP

[14] A notation in the form "AHAM, TP No. 10 at p. 2" identifies a written comment (1) made by AHAM; (2) recorded in document number 10 that is filed in the docket of this test procedures rulemaking (Docket No. EERE–2008–BT–TP–0010) and maintained in the Resource Room of the Building Technologies Program; and (3) which appears on page 2 of document number 10.

[15] A notation in the form "AHAM, Public Meeting Transcript, TP No. 8 at pp. 17, 29–35, 39–40" identifies an oral comment that DOE received during the December 17, 2008, NOPR public meeting, was recorded in the public meeting transcript in the docket for this test procedure rulemaking (Docket No. EERE–2008–BT–TP–0010), and is maintained in the Resource Room of the Building Technologies Program. This particular notation refers to a comment (1) made by AHAM during the public meeting; (2) recorded in document number 8, which is the public meeting transcript that is filed in the docket of this test procedure rulemaking; and (3) which appears on pages 17, 29–35, and 39–40 of document number 8.

No. 8 at pp. 35–36) Pacific Gas & Electric (PG&E) stated that it supports harmonization, but does not support any significant delays in this rulemaking. (PG&E, Public Meeting Transcript, TP No. 8 at p. 35)

In the December 2008 TP NOPR, DOE anticipated, based on review of draft versions of IEC Standard 62301 Second Edition, that the revisions to IEC Standard 62301 could include different mode definitions. As discussed in section I, DOE thus determined to publish an SNOPR for the test procedure rulemaking in which the new mode definitions from the IEC Standard 62301 Second Edition, expected in July 2009, would be considered. However, more recently, DOE received information that IEC Standard 62301 Second Edition would not be available until late 2010. Because the final version of IEC Standard 62301 Second Edition would not be published in time for the consideration of standby and off mode power consumption in the concurrent energy conservation standards rulemaking, DOE, therefore, determined to consider the new mode definitions from the draft version IEC Standard 62301 CDV. Based on DOE's review of IEC Standard 62301 CDV, DOE believes the definitions of standby mode, off mode, and active mode provided in IEC Standard 62301 CDV expand upon the EPCA mode definitions and provide additional guidance as to which functions are associated with each mode. DOE also believes that the comments received by IEC on IEC Standard 62301 CD2, and the resulting amended mode definitions proposed in IEC Standard 62301 CDV, demonstrate significant participation of interested parties in the development of the best possible definitions. For these reasons, DOE is proposing in today's SNOPR definitions of standby mode, off mode, and active mode based on the definitions provided in IEC Standard 62301 CDV. These definitions are discussed in detail in Section III.B.2. DOE is narrowly considering such language from IEC Standard 62301 CDV, even though this is not a finalized test standard, because of the consensus among comments received, and DOE's corroborating belief, that the mode definitions in the draft versions of IEC Standard 62301 Second Edition represent a substantial improvement over those in IEC Standard 62301.

DOE did not receive any comments in response to the December 2008 TP NOPR objecting to the proposed testing methods and procedures referenced in IEC Standard 62301. As noted above, IEC Standard 62301 will be the "current version" at the time of publication of the final rule, so consideration thereof will comply with EPCA. (42 U.S.C. 6295(gg)(2)(A)) For these reasons, this SNOPR does not affect DOE's proposal in the December 2008 TP NOPR to incorporate by reference the clauses presented above from IEC Standard 62301.

2. Determination of Modes To Be Incorporated

In the December 2008 TP NOPR, DOE proposed to incorporate into the clothes dryer and room air conditioner test procedure the definitions of "active mode," "standby mode," and "off mode" specified by EPCA. 73 FR 74639, 74644 (Dec. 9, 2008) EPCA defines "active mode" as "the condition in which an energy-using product—

(I) Is connected to a main power source;

(II) Has been activated; and

(III) Provides 1 or more main functions."

(42 U.S.C. 6295(gg)(1)(A)(i))

EPCA defines "standby mode" as "the condition in which an energy-using product—

(I) Is connected to a main power source; and

(II) Offers 1 or more of the following user-oriented or protective functions:

(aa) To facilitate the activation or deactivation of other functions (including active mode) by remote switch (including remote control), internal sensor, or timer.

(bb) Continuous functions, including information or status displays (including clocks) or sensor-based functions."

(42 U.S.C. 6295(gg)(1)(A)(iii)) This definition differs from the one provided in IEC Standard 62301 by permitting the inclusion of multiple standby modes.

EPCA defines "off mode" as "the condition in which an energy-using product—

(I) Is connected to a main power source; and

(II) Is not providing any standby mode or active mode function." [16]

(42 U.S.C. 6295(gg)(1)(A)(ii))

In the December 2008 TP NOPR, DOE recognized that these definitions for "active mode," "standby mode," and "off mode" were developed to be broadly applicable for many energy-using products. For specific products with multiple functions, these broad definitions could lead to unintended consequences if the meaning of "main functions" is narrowly interpreted. 73 FR 74639, 74644–45 (Dec. 9, 2008). To address this problem, DOE proposed in the December 2008 TP NOPR to amend the clothes dryer and room air conditioner test procedures to clarify the range of main functions that would be classified as active mode functions and establish standby and off mode definitions as follows. 73 FR 74639, 74645, 74645 (Dec. 9, 2008)

DOE proposed the following mode definitions for clothes dryers in the December 2008 TP NOPR:

"Active mode" means a mode in which the clothes dryer is performing the main function of tumbling the clothing with or without heated or unheated forced air circulation to remove moisture from the clothing and/or remove or prevent wrinkling of the clothing;

"Inactive mode" means a standby mode other than delay start mode or cycle finished mode that facilitates the activation of active mode by remote switch (including remote control), internal sensor, or timer, or provides continuous status display;

"Cycle finished mode" means a standby mode that provides continuous status display following operation in active mode;

"Delay start mode" means a standby mode that facilitates the activation of active mode by timer; and

"Off mode" means a mode in which the clothes dryer is not performing any active or standby function. 73 FR 74639, 74645 (Dec. 9, 2008).

For room air conditioners, DOE proposed the following mode definitions in the December 2008 TP NOPR:

"Active mode" means a mode in which the room air conditioner is performing the main function of cooling or heating the conditioned space, or circulating air through activation of its fan or blower, with or without energizing active air-cleaning components or devices such as ultraviolet (UV) radiation, electrostatic filters, ozone generators, or other air-cleaning devices;

"Inactive mode" means a standby mode other than delay start mode or off-cycle mode that facilitates the activation of active mode by remote switch (including remote control) or internal sensor or provides continuous status display;

"Delay start mode" means a standby mode in which activation of an active mode is facilitated by a timer;

[16] DOE notes that some features that provide consumer utility, such as displays and remote controls, are associated with standby mode and not off mode. A clothes dryer or room air conditioner is considered to be in "off mode" if it is plugged in to a main power source, is not being used for an active function such as drying clothing or providing cooling, and is consuming power for features other than a display, controls (including a remote control), or sensors required to reactivate it from a low power state. For example, a clothes dryer with mechanical controls and no display or continuously-energized moisture sensor, but that consumed power for components such as a power supply when the unit was not activated, would be considered to be in off mode when not providing an active function. For room air conditioners, a unit with mechanical controls and no display or remote control but with a power supply that is consuming energy, for example, could be considered to be in off mode while not providing an active function.

"Off-cycle mode" means a standby mode in which the room air conditioner: (1) Has cycled off its main function by thermostat or temperature sensor; (2) does not have its fan or blower operating; and (3) will reactivate the main function according to the thermostat or temperature sensor signal; and

"Off mode" means a mode in which a room air conditioner is not performing any active or standby function. 73 FR 74639, 74645 (Dec. 9, 2008).

DOE received numerous comments from interested parties on the standby and off mode definitions. DOE did not receive any comments objecting to the proposed definitions of active mode for clothes dryers and room air conditioners. As discussed in the following paragraphs regarding standby mode definitions, DOE did receive comments stating that certain modes that it had proposed as standby modes should be considered as part of active mode. In addition, AHAM's comments reiterated the definition of active mode in general as provided by EISA 2007 and stated that this definition is consistent with the energy mode definition in IEC Standard 62301. AHAM's comments also state, however, that when a product is not in off mode or standby mode, it is in active mode. (AHAM, TP No. 12 at p. 1) Such a definition is inconsistent with the EPCA, IEC Standard 62301 CD2, and IEC Standard 62301 CDV mode definitions, in which off mode is defined as providing no standby or active mode function. (42 U.S.C. 6295(gg)(1)(A)(ii))

As to the active mode, as discussed in section III.B.1, DOE is proposing in today's SNOPR to amend the DOE clothes dryer and room air conditioner test procedures to define active mode as a mode which "includes product modes where the energy using product is connected to a main power source, has been activated and provides one or more main functions." 10 CFR part 430, subpart B, appendix D1, proposed section 1.1 and appendix F, proposed section 1.1. The proposed definition of active mode is the same as the definition proposed for the December 2008 TP NOPR. 73 FR 74639, 74644 (Dec. 9, 2008). DOE notes that IEC Standard 62301 CD2 provided additional clarification that "delay start mode is a one off user initiated short duration function that is associated with an active mode." (IEC Standard 62301 CD2, section 3.8) IEC Standard 62301 CDV removed this clarification; however, in response to comments on IEC Standard 62301 CD2 that led to IEC Standard 62301 CDV, IEC states that delay start mode is a one off function of limited duration.[17] DOE infers this to mean that delay start mode would not be considered a standby mode, although no conclusion is made as to whether it would be considered part of active mode.

DOE is also proposing the additional clarifications discussed above for the range of main functions that would be classified as active mode functions, which were proposed in the December 2008 TP NOPR. For clothes dryers, DOE is proposing that the main function consist of tumbling the clothing with or without heated or unheated forced air circulation to remove moisture from the clothing and/or remove or prevent wrinkling of the clothing. 10 CFR part 430, subpart B, appendix D1, proposed section 1.1. For room air conditioners, DOE is proposing that the main function consist of cooling or heating the conditioned space, or circulating air through activation of its fan or blower, with or without energizing active air-cleaning components or devices such as ultraviolet (UV) radiation, electrostatic filters, ozone generators, or other air-cleaning devices. 10 CFR part 430, subpart B, appendix F, proposed section 1.1. DOE believes this proposed definition of active mode provides sufficient specificity for room air conditioners.

For clothes dryers, DOE additionally investigated whether certain operating cycles providing a steam function should be covered under active mode, and whether measurement of energy consumption for such cycles should be incorporated into the DOE clothes dryer test procedure. Based on its research and discussions with manufacturers, DOE believes that the general purpose of steam in a clothes dryer cycle is to soften the clothing load to ease wrinkles, sanitize clothes, eliminate static electrical charge, and/or help remove odors. As part of its reverse engineering analyses conducted for the energy conservation standards rulemaking for residential clothes dryers, DOE observed that the steam may be generated by spraying a fine mist of water into the heated drum, allowing the hot clothing load to evaporate the water, or the steam may be produced in a generator outside the drum before injecting it in with the clothes load. Most steam-equipped clothes dryers require a hookup to the cold water line that would supply water to an adjacent clothes washer. On certain models, however, the clothes dryer contains a user-fillable water reservoir. Steam functions typically are programmed as unique operating cycles, although manufacturers may provide the option to add steam during a conventional drying cycle or to periodically tumble and inject steam over a certain amount of time at the end of a conventional drying cycle to prevent wrinkling.

The current DOE test procedure does not contain any provisions that would account for the energy and water use of such steam cycles. Based on a preliminary market survey of products available on the market, DOE's estimates suggest that, at this time, steam cycles represent a very small fraction of overall product use on a nationwide basis. DOE is unaware of energy and water consumption or consumer usage data with respect to steam. For these reasons, DOE is not proposing amendments to include measurement of steam cycles for clothes dryers.

DOE received multiple comments regarding the proposed definition and clarifications for standby modes. AHAM opposed the establishment of multiple low power or standby modes for both clothes dryers and room air conditioners. AHAM stated that "delay start" and "cycle finished" modes for clothes dryers and "delay start" and "off-cycle" modes for room air conditioners should not be defined as standby modes, because in each case the product is not operating at its lowest power state. (AHAM, TP No. 10 at pp. 2–4) AHAM stated that the delay start function is associated with an active cycle, requires input by the consumer, and persists for a defined time. AHAM further stated that the cycle finished mode for clothes dryers and the off-cycle mode for room air conditioners are modes of limited duration that are associated with an active cycle, wherein the product is not operating at its lowest power state. According to AHAM, this condition is in conflict with the IEC Standard 62301 definition that standby mode "* * * may persist for an indefinite time * * *" (AHAM, TP No. 10 at pp. 2–3) For these reasons, AHAM commented that delay start mode for both products, cycle finished mode for clothes dryers, and off-cycle mode for room air conditioners should be incorporated into active mode, or that a standard empirical value should be added to all active energy measurements to represent the energy use of these low-power modes. *Id.* AHAM also noted that, for room air conditioners, delay start mode and off-cycle mode are energy-saving features which, in an integrated energy-use metric combining the energy use of these modes with

[17] "Compilation of comments on 59/523/CD: IEC 62301 Ed 2.0: Household electrical appliances—Measurement of standby power." August 7, 2009. p. 6. IEC Standards are available online at *http://www.iec.ch.*

energy use in active mode, result in lower-efficiency units that don't have such features appearing to be more efficient than units with these energy-saving features. (AHAM, TP No. 10 at p. 4)

GE adopted by reference AHAM's comments on the definitions of multiple standby modes. (GE, TP No. 11 at p. 1) Whirlpool also opposed defining multiple active and standby modes because doing so would add complexity to the test procedure without adding value to the measurements. Whirlpool agreed with AHAM and GE that delay start and cycle finished modes, which are user-initiated primary functions of the product, are part of active mode rather than separate standby modes. (Whirlpool, TP No. 9 at p. 2) PG&E added that it is confusing to consider as an off-cycle mode the state in which the thermostat has cycled off the fan and compressor. PG&E stated that this state should be considered part of the active mode. (PG&E, Public Meeting Transcript, TP No. 8 at pp. 84–85)

As discussed in section III.B.1, DOE is proposing in today's SNOPR to amend the DOE test procedure for clothes dryers and room air conditioners to define standby mode based on the definitions provided in IEC Standard 62301 CDV. DOE proposes to define standby mode as a mode which "includes any product modes where the energy using product is connected to a main power source and offers one or more of the following user oriented or protective functions which may persist for an indefinite time: [18]

- To facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, timer;
- Continuous function: Information or status displays including clocks;
- Continuous function: Sensor-based functions." 10 CFR part 430, subpart B, appendix D1, proposed section 1.19 and appendix F, proposed section 1.5.

DOE is proposing an additional clarification that "a timer is a continuous clock function (which may or may not be associated with a display) that provides regular scheduled tasks (*e.g.,* switching) and that operates on a continuous basis." *Id.* This definition was developed based on the definitions provided in IEC Standard 62301 CDV, and expands upon the EPCA mode definitions to provide additional clarifications as to which functions are associated with each mode.

Based on these proposed definitions, delay start mode and cycle-finished mode for clothes dryers and delay start mode and off-cycle mode for room air conditioners are not modes that persist for an indefinite time, and would therefore not be considered as part of a standby mode. DOE's analysis of annual energy use in specific clothes dryer and room air conditioner modes—presented in the December 2008 TP NOPR—determined that delay start mode and cycle-finished mode for clothes dryers, and delay start mode and off-cycle mode for room air conditioners, each represent a negligible portion (0.1 percent or less) of the annual energy use for the particular product. 73 FR 74639, 74647, 74649 (Dec. 9, 2008). Therefore, an integrated energy efficiency metric for either clothes dryers or room air conditioners would not be measurably affected by either the inclusion or exclusion of the energy use in any of these modes. Further, DOE believes that the benefit of incorporating the energy use of these modes into the overall energy efficiency (*i.e.,* providing greater specificity in the evaluation of methods for reducing energy consumption and the potential for energy savings for the energy conservation standards rulemaking) is outweighed by the burden that would be placed on the manufacturers to measure power consumption in each of these modes. For these reasons, DOE is not proposing amendments to the test procedures to define delay start, cycle finished, and off-cycle modes or to measure power consumption in delay start mode for either product, cycle finished mode for clothes dryers, and off-cycle mode for room air conditioners in today's SNOPR. DOE is only including in the proposed clothes dryer and room air conditioner test procedures amendments in this SNOPR provisions for measuring energy consumption in the inactive mode and off mode.

AHAM commented that the term "inactive mode" should be changed to "standby mode" for simplicity and to remain consistent in the use of this term. In addition, AHAM stated that DOE should define standby mode as "the lowest power consumption mode which cannot be switched off or influenced by the user" (*i.e.,* not performing any function, but ready to perform a function) to be consistent with IEC Standard 62301. (AHAM, TP No. 10 at pp. 2–3) The comments which AHAM subsequently submitted to DOE clarified AHAM's suggested definition by stating that standby mode should be defined as "the lowest-power consumption mode when the appliance is connected to the main electricity supply and is used in accordance with the manufacturer's instructions. Standby mode power usage is the power (wattage) consumed by an appliance at the factory setting. Standby Mode may persist for an indefinite period of time." (AHAM, TP No. 12 at p. 2) AHAM stated that appliances to which its comments apply should be shipped in this mode. If the factory or "default" settings are indicated in manufacturer's instructions, AHAM stated that the appliance should be tested at those settings; otherwise, the appliance should be tested as shipped. *Id.* AHAM commented that any other feature accessible by the consumer should be considered as active mode, and, therefore, the definitions for off, standby and active modes should cover all clothes dryer and room air conditioner features. (AHAM, TP No. 10 at pp. 3–4)

Although at this time DOE is proposing to amend the test procedures for room air conditioners and clothes dryers to include only provisions for measuring energy use in inactive mode and that delay start, cycle finished, and off-cycle modes would not be considered part of standby mode, DOE remains open to consideration of additional standby modes. Therefore, DOE is not renaming "inactive mode" to "standby mode" in today's SNOPR. However, DOE agrees that, in measuring the single significant standby mode (inactive mode), power consumption would be measured in the lowest possible energy state, as discussed in section III.B.3.

In response to AHAM's comments, DOE believes that provisions for setting up the appliance for standby mode and off mode testing should be specified in the test procedure. However, DOE believes that setting up the appliance in accordance with manufacturer's instructions or in the as-shipped factory or "default" settings, as commented by AHAM, would allow manufacturers to ship appliances set in a low power mode that consumers may switch out of during typical standby or off mode use. In order to provide a clear and consistent testing method, DOE is proposing that the appliance be set up with the settings that produce the highest power consumption level, consistent with the particular mode

[18] The actual language for the standby mode definition in IEC Standard 62301 CDV describes "* * * user oriented or protective functions which usually persist" rather than "* * * user oriented or protective functions which may persist for an indefinite time." DOE notes, however, that section 5.1 of IEC Standard 62301 CDV states that "a mode is considered persistent where the power level is constant or where there are several power levels that occur in a regular sequence for an indefinite period of time." DOE believes that the proposed language, which was originally included in IEC Standard 62301 CD2, encompasses the possible scenarios foreseen by section 5.1 of IEC Standard 62301 CDV without unnecessary specificity.

definition under test, for standby and off mode testing. 10 CFR part 430, subpart B, appendix D1, proposed section 3.6 and appendix F, proposed section 4.2.

In the December 2008 TP NOPR, DOE requested comment on additional standby modes under the EPCA definition which had not been identified and which could represent significant energy use. 73 FR 74639, 74654 (Dec. 9, 2008) AHAM commented that, although there is the potential for networking in the future relating to functions such as peak load sharing, this feature would be considered part of active mode. According to AHAM, this mode might be selected by the consumer, thereby taking the product out of the default lowest power mode. (AHAM, TP No. 10 at p. 3) PG&E commented that it agrees with AHAM that network mode should be considered. PG&E added that if network mode is on all the time, then this mode should be considered a standby function, whereas if this mode is consumer-activated and on for limited periods of time, it should be considered part of active mode. (PG&E, Public Meeting Transcript, TP No. 8 at pp. 79, 86) GE raised concerns that some utilities require that a network function remain on continuously in order for consumers to get the peak-power rebates, implying that manufacturers may not have control over the way this part of the control works. (GE, Public Meeting Transcript, TP No. 8 at p. 87) PG&E responded by commenting that network modes might be designed for low power and intermittent activation. (PG&E, Public Meeting Transcript, TP No. 8 at pp. 87–88)

Section 3.7 of IEC Standard 62301 CDV defines network mode as a mode category which "includes any product modes where the energy-using product is connected to a main power source and at least one network function is activated (such as reactivation via network command or network integrity communication) but where the primary function is not active." Section 3.7 of IEC Standard 62301 CDV also provides a note stating, "Where a network function is provided but is not active and/or not connected to a network, then this mode is not applicable. A network function could become active intermittently according to a fixed schedule or in response to a network requirement. A 'network' in this context includes communication between two or more separate independently powered devices or pieces of equipment. A network does not include one or more controls, which are dedicated to a single piece of equipment. Network mode may include one or more standby functions." However, DOE is unaware of any clothes dryers or room air conditioners currently available on the market that incorporate a networking function. Further, DOE is unaware of any data regarding network mode in these products, which would allow it to determine appropriate testing procedures and mode definitions for incorporation into the test procedures for clothes dryers and room air conditioners. In particular, DOE is unaware of data and methods for the appropriate configuration of networks, whether network connection speed or the number and type of network connections affects power consumption, or whether wireless network devices may have different power consumptions when the device is looking for a connection and when the network connection is actually established. DOE is also unaware of how the energy consumption for clothes dryers and room air conditioners in a network environment may be affected by their product design and user interaction as well as network interaction, such as whether the network function could become active intermittently according to a fixed schedule or in response to a network requirement. For these reasons, the proposed amendments in today's SNOPR do not include network mode. However, DOE welcomes comment on whether clothes dryers and room air conditioners are available that incorporate a networking function, and whether definitions and testing procedures for a network mode should be incorporated into the DOE test procedure. DOE also requests comment on appropriate methodologies for measuring energy consumption in a network mode, and data on the results and repeatability of such testing methodology.

GE commented that standby mode should not apply to room air conditioners because they are considered continuously running products which operate in active mode 100 percent of the time that they are plugged into the main electricity supply and not in off mode. (GE, TP No. 11 at p. 2) DOE determined that room air conditioners with remote controls operate in a mode which facilitates the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control). This mode is covered by both the proposed definition in today's SNOPR and the EPCA definition for standby mode, and, hence, DOE believes that standby mode would apply to room air conditioners under the proposed definition.

DOE also requested comment on the definition and clarifications of off mode that were proposed in the December 2008 TP NOPR. AHAM stated it supports DOE's definition of off mode, but believes this definition must be clarified. (AHAM, TP No. 10 at pp. 2–4) AHAM provided clarifications in its comments, which state the following:

> "Off Mode describes the status of an appliance when it is connected to the main electricity supply and is providing no consumer-interactive function. Off Mode may persist for an indefinite period of time. Providing the product with an on/off switch satisfies this condition.
>
> Off Mode may include:
>
> 1. LED or some other indication of off mode condition;
>
> 2. Electric noise reduction capacitor, choke or filter;
>
> 3. The state where a one-way remote control device has turned the product off, but cannot be used to activate the product.
>
> 4. Leakage current will occur in some appliances, and may include current flow in 208/230 volt appliances where only one leg of the line is isolated by the switch.
>
> 5. May include electrical energy flow to a transformer of some electronics units."

(AHAM, TP No. 12 at p. 2)

As discussed in section III.B.1, DOE is proposing in today's SNOPR to amend the DOE test procedure for clothes dryers and room air conditioners to define off mode based upon the definition in IEC Standard 62301 CDV. DOE proposes to define off mode as a mode category which "includes any product modes where the energy using product is connected to a mains power source and is not providing any standby mode or active mode function and where the mode may persist for an indefinite time.[19] An indicator that only shows the user that the product is in the off position is included within the clasification of off mode." As noted in section III.B.1, this defintion was developed based on the definitions provided in IEC Standard 62301 CDV, and expands upon the EPCA mode definitions to provide additional clarifications as to which functions are associated with each mode.

In response to AHAM's comments regarding off mode, under the proposed mode definitions, a clothes dryer or room air conditioner equipped with a mechanical on/off switch which can disconnect power to the display and/or control components would be

[19] As with the definition for standby mode, IEC Standard 62301 CDV qualifies off mode as one that "* * * usually persists" rather than one that "* * * may persist for an indefinite time." For the same reasons as discussed for standby mode, DOE is proposing the latter definition.

considered as operating in the off mode when the switch is in the "off" position, provided that no other standby or active mode functions are energized. DOE agrees with AHAM that an energized LED or other indication that only shows the user that the product is in the off position would be considered part of off mode under the proposed definition, again if no other standby or active mode functions were energized. However, if any energy is consumed by the appliance in the presence of a one-way remote control, the unit would be operating in standby mode pursuant to EPCA (42 U.S.C. 6295(gg)(1)(A)(iii)), which includes a remote control which facilitates the activation or deactivation of other functions (including active mode) as a feature of standby mode. DOE agrees that the other three conditions, which AHAM outlines in its comments, would be indicative of off mode. Because DOE believes that a one-way remote control would be a function associated with standby mode, and not off mode as stated by AHAM, DOE is not proposing to adopt AHAM's definition for off mode.

DOE also notes that section 3.9 of IEC Standard 62301 CDV provides a definition of "disconnected mode," which is "the status in which all connections to mains power sources of the energy using product are removed or interrupted." IEC Standard 62301 CDV also adds a note that common terms such as "unplugged" or "cut off from mains" also describe this mode and that this mode is not part of the low power mode category. DOE believes that there would be no energy use in a "disconnected mode," and therefore, is not proposing a definition or testing methods for such a mode in the DOE test procedure for clothes dryers or room air conditioners.

3. Adding Specifications for the Test Methods and Measurements for Clothes Dryer and Room Air Conditioner Standby Mode and Off Mode Testing

DOE proposed in the December 2008 TP NOPR to establish test procedures for measuring all standby and off modes associated with clothes dryers and room air conditioners. 73 FR 74639, 74645 (Dec. 9, 2008). As discussed in section III.B.2, the mode identified as inactive mode in the December 2008 TP NOPR is believed to be the only significant standby mode for clothes dryers and room air conditioners at this time. This section discusses product-specific clarifications of the procedures of IEC Standard 62301 when used to measure standby and off mode energy use for clothes dryers and room air conditioners.

a. Clothes Dryers

DOE understands that displays on clothes dryers may reduce power consumption by automatically dimming or powering down after a certain period of user inactivity. For those clothes dryers for which the power input in inactive mode varies in this fashion during testing, DOE proposed in the December 2008 TP NOPR that that the test be conducted after the power level has dropped to its lower power state. 73 FR 74639, 74645 (Dec. 9, 2008).

PG&E commented that, while IEC Standard 62301 notes that some appliances wait in a higher-power state before dropping back to a lower-power state, the standard does not provide guidance on how long to wait for the appliance to drop to the lower-power state. (PG&E, Public Meeting Transcript, TP No. 8 at pp. 25–27) AHAM stated that section 5 of IEC Standard 62301 specifies a stabilization time of 30 minutes. (AHAM, Public Meeting Transcript, TP No. 8 at pp. 28–29) AHAM subsequently clarified in written comments that IEC Standard 62301 calls for a stabilization period of at least 30 minutes and a measurement period of at least 10 minutes, and that DOE's test procedure should be consistent with that of IEC Standard 62301 to reduce test burden. (AHAM, TP No. 10 at p. 4) Whirlpool commented that most test procedures involving electronics incorporate a 30-minute stabilization period and a 10-minute measurement period. Whirlpool believes that these requirements would be reasonable for DOE's test procedures. (Whirlpool, TP No. 9 at p. 3) PG&E supported the specification of a 30-minute stabilization period. (PG&E, Public Meeting Transcript, TP No. 8 at p. 50)

As part of the residential clothes dryer energy conservation standards rulemaking preliminary analyses, DOE conducted standby mode and off mode testing on 11 representative residential clothes dryers. Table 0.1 shows the measured duration of the higher-power state for clothes dryers in DOE's test sample. DOE observed during this testing that the higher-power state in inactive mode may persist for approximately 5–10 minutes of user inactivity after the user interface display has been energized for all products tested.

TABLE 0.1—CLOTHES DRYER STANDBY MODE TESTING: DURATION OF HIGHER-POWER STATE

Product class	Test unit	Control type	Automatic power-down?	Duration of higher-power state (min)
Vented Electric, Standard	1	Electromechanical	N	
	2	Electromechanical	N	
	3	Electronic	Y	5
	4	Electromechanical	N	
	5	Electromechanical	N	
Vented Electric, Compact (120 V)	6	Electromechanical	N	
Vented Gas	7	Electromechanical	N	
	8	Electronic	Y	5
	9	Electronic	Y	5
	10	Electronic	Y	7
	11	Electronic	Y	7

Paragraph 5.3.1 of section 5.3 of IEC Standard 62301 specifies, for products in which the power varies by not more than 5 percent from a maximum level during a period of 5 minutes, that the user waits at least 5 minutes for the product to stabilize and then measures the power at the end of an additional time period of not less than 5 minutes. Paragraph 5.3.2 of IEC Standard 62301 contains provisions for measuring average power in cases where the power is not stable. In such cases, it requires a measurement period of no less than 5 minutes, or one or more complete

operating cycles of several minutes or hours. IEC Standard 62301 contains no requirement that the stabilization period extends to 30 minutes, nor that the measurement is made over a period of at least 10 minutes. However, based on its testing results shown in Table 0.1, DOE also notes that some clothes dryers may remain in the higher-power state for the duration of a 5-minute stabilization period and 5-minute measurement period, and then drop to the lower-power state that is more representative of inactive mode. In contrast, IEC Standard 62301 CDV specifies for each testing method that the product be allowed to stabilize for at least 30 minutes prior to a measurement period of not less than 10 minutes. DOE believes this clarification would allow sufficient time for displays that automatically dim or power down after a period of user inactivity to reach the lower-power state prior to measurement. Based on the automatic power-down time periods observed in its own testing, DOE believes that the 30-minute stabilization and 10-minute measurement periods suggested by commenters provide a clearer and more consistent testing procedure than the corresponding times specified in IEC Standard 62301. This allows for representative measurements among products that may have varying times before the power drops to a low level.

DOE also notes that allowing a test period of "not less than" or "at least" a specified amount of time, as provided in both IEC Standard 62301 and IEC Standard 62301 CDV, may result in different test technicians testing the same product for different periods of time. In order to ensure that the testing procedures for standby and off mode are clear and consistent, such that different test technicians are testing the product using the same procedures, DOE is proposing to require that the stabilization period be 30 to 40 minutes, and the test period be 10 minutes. 10 CFR part 430, subpart B, appendix D1, proposed section 3.6.

The American Council for an Energy Efficient Economy (ACEEE) stated that the test procedure could be "gamed" by products for which the default setting would be for the display to power down after 5 minutes, but which would easily allow consumers to increase the duration of the higher-power state, or switch the product to permanently maintain the higher-power state. ACEEE commented that DOE should include additional guidance to level the playing field for all manufacturers. (ACEEE, Public Meeting Transcript, TP No. 8 at pp. 27–28) AHAM's comments for all covered products suggest that these products may have provision for the consumer to add or delete product functions that alter the as-shipped standby energy consumption, and that the power consumption in these user-selected states may exceed the power consumption in the lowest power consumption mode. AHAM stated that the consumer must be informed as to how to make the selections that would override the lowest power consumption mode. (AHAM, TP No. 12 at p. 2)

DOE's test procedures are developed to measure representative energy use for the typical consumer. DOE does not have data representing all possible consumer actions and appliance usage patterns that might increase energy use. As discussed above in section III.B.2, DOE is proposing that the appliance be set up with the settings that produce the highest power consumption level, consistent with the particular mode definition under test, for standby and off mode testing. DOE believes that this would prevent any "gaming" of default or as-shipped settings. For this reason, DOE has not proposed additional provisions in today's SNOPR to address the possibility of adjusting the as-shipped or default display settings or other features for higher energy use. However, DOE welcomes comment on methodologies to account for such consumer actions that might increase energy use and data on the corresponding consumer usage patterns.

DOE proposed in the December 2008 TP NOPR to adopt the test room ambient temperature of 73.4 ± 9 °F specified by IEC Standard 62301 for standby mode and off mode testing. 73 FR 74639, 74645–46 (Dec. 9, 2008). This test room ambient temperature is slightly different from the ambient temperature currently specified for DOE's drying performance tests of clothes dryers (75 ± 3 °F). However, the proposed test room ambient temperature conditions would permit manufacturers who opt to test active, standby, and off modes sequentially in the same test room to use the current ambient temperature requirements for drying tests, since the latter temperatures are within the limits specified by IEC Standard 62301. Alternatively, the proposed temperature specifications would allow a manufacturer that opts to conduct standby mode and off mode testing separately from drying tests more flexibility in ambient temperature. AHAM and Whirlpool supported DOE's test room ambient temperature specifications for standby mode and off mode testing of clothes dryers. (AHAM, TP No. 10 at p. 5; Whirlpool, TP No. 9 at p. 3) In the absence of comments objecting to the ambient temperature specifications, this SNOPR does not affect DOE's proposal in the December 2008 TP NOPR to use the test room ambient temperature specified by IEC Standard 62301 for clothes dryer standby mode and off mode testing.

b. Room Air Conditioners

A room air conditioner with a temperature display may use varying amounts of standby power depending on the digit(s) being displayed. DOE proposed in the December 2008 TP NOPR to require that test room temperature be maintained at 74 ± 2 °F, and that the temperature control setting is 79 °F. 73 FR 74639, 74646 (Dec. 9, 2008). These conditions differ from the cooling performance testing conditions in the DOE room air conditioner test procedure. The cooling performance test conditions are specified as 80 °F on the indoor side of the test chamber and 95 °F on the outdoor side. In addition, the cooling performance test conditions do not specify a temperature control setting. DOE proposed the different test room conditions in the December 2008 TP NOPR because such conditions would assure a consistent display configuration, and thus a representative power consumption, for all room air conditioners under test, particularly during off-cycle operation that was defined in the December 2008 TP NOPR as a standby mode. 73 FR 74639, 74646 (Dec. 9, 2008).

GE commented that the smaller tolerances specified by IEC Standard 62301, for ambient conditions that differ from the conditions for cooling performance testing, represent a testing burden. GE believes that the proposed conditions would be relevant only for off-cycle mode. (GE, Public Meeting Transcript, TP No. 8 at pp. 99–100) ACEEE commented that there would be no objection among interested parties to relax tolerance of the temperatures, if such close specification were not required. (ACEEE, Public Meeting Transcript, TP No. 8 at p. 101) AHAM commented that the proposed test room temperature is unrealistic and burdensome. (AHAM, TP No. 10 at p. 5) AHAM also stated that if off-cycle mode is considered part of active mode, then standby mode testing could be carried out in the same test chamber that is used for cooling performance testing because standby mode (other than off-cycle) is not affected by ambient temperature. (AHAM, Public Meeting Transcript, TP No. 8 at pp. 103–104)

As part of the room air conditioner energy conservation standards rulemaking preliminary analyses, DOE conducted standby mode and off mode testing on representative room air

conditioners. During its preliminary tests, DOE determined that room air conditioner displays among the units it tested do not provide any user information in inactive mode. In addition, DOE determined that the displays among the units it tested provide indication of time delay or time until start rather than temperature when the air conditioners are in delay start mode. These observations are supported by GE's comment, discussed above, that the proposed test chamber ambient conditions would be relevant only for off-cycle mode. (GE, Public Meeting Transcript, TP No. 8 at pp. 99–100) DOE concurs with GE's position that if the test procedure were limited to measurement of a single standby mode and an off mode as discussed in section III.B.2, the proposed close tolerance on ambient temperature would not be required. DOE is, therefore, proposing in today's SNOPR to provide flexibility in the room air conditioner test procedure amendments by allowing standby mode and off mode testing either in a test chamber used for measurement of cooling performance or in a separate test room that meets the specified standby mode and off mode test conditions. The proposed amendments to the room air conditioner test procedure in today's SNOPR specify maintaining the indoor test conditions, if tested in a cooling performance test chamber, or room ambient test conditions, if tested in a separate test room, at the temperature required by section 4.2 of IEC Standard 62301. Further, if the unit is tested in the cooling performance test chamber, the proposed amendments allow the manufacturer to maintain the outdoor test conditions either as specified for the DOE cooling test procedure or according to section 4.2 of IEC Standard 62301 for standby and off mode testing. DOE also notes that the indoor temperature conditions required by the DOE cooling performance test procedure fall within the temperature range allowed by section 4.2 of IEC Standard 62301.

DOE proposed a test procedure for the delay start mode in the December 2008 TP NOPR that required a 5-minute stabilization period followed by a 60-minute measurement period. 73 FR 74639, 74646 (Dec. 9, 2008) Because the proposed amendments to the test procedure in today's SNOPR are limited to the measurement of a single standby mode and an off mode as discussed in section III.B.2, DOE is not proposing any provisions in the room air conditioner test procedure for measuring delay start mode.

Similar to clothes dryers, DOE proposed in the December 2008 TP NOPR (73 FR 74639, 74646 (Dec. 9, 2008)) that standby and off modes for room air conditioners, other than delay start mode, be tested with a stabilization period no less than 5 minutes and a measurement period no less than 5 minutes for units with stable power, consistent with paragraph 5.3.1 of section 5.3 of IEC Standard 62301. In cases where the power was unstable, the provisions of paragraph 5.3.2 would apply, in which the measurement period would be no less than 5 minutes or one or more complete operating cycles. AHAM commented that IEC Standard 62301 requires a stabilization period at least 30 minutes long and a measurement period at least 10 minutes long and that DOE's test procedure should be consistent with that of IEC Standard 62301 to reduce test burden. (AHAM, TP No. 10 at p. 4) DOE does not have any information or data that would suggest that a 30-minute stabilization period followed by a 10-minute measurement period would produce more representative or consistent standby and off mode power measurements than the times proposed in the December 2008 TP NOPR.

However, DOE also notes that allowing a test period of "not less than" or "at least" a specified amount of time, as provided in IEC Standard 62301, may result in different test technicians testing the same product for different periods of time. In order to ensure that the testing procedures for standby and off mode are clear and consistent, such that different test technicians are testing the product using the same exact procedures, DOE is proposing to require that the stabilization period be 5 to 10 minutes, and the test period be 5 minutes. 10 CFR part 430, subpart B, appendix F, proposed section 4.2.

4. Calculation of Energy Use Associated With Standby Modes and Off Mode

Measurements of power consumption associated with each standby and off mode for clothes dryers and room air conditioners are expressed in W. The annual energy consumption in each of these modes for a clothes dryer or room air conditioner is the product of the power consumption in W and the time spent in that particular mode.

a. Clothes Dryers

Energy use for clothes dryers is expressed in terms of total energy use per drying cycle. As discussed in section III.D.3, DOE has determined that it is technically feasible to incorporate measures of standby and off mode energy use into the overall energy-use metric, a determination that is required by the EISA 2007 amendments to EPCA. (42 U.S.C. 6295(gg)(2)(A)) Therefore, DOE has examined standby and off mode energy consumption in terms of annual energy use apportioned on a per-cycle basis. Energy used during a drying cycle (active mode) is directly measured in the DOE test procedure, although adjustments are made to the directly measured energy to account for differences between test and field conditions. The energy use associated with continuously burning pilot lights of gas dryers is measured and is converted to an energy use per cycle by dividing calculated annual gas energy use by the representative average number of drying cycles per year (*i.e.,* 416). 10 CFR part 430, subpart B, appendix D, section 4.4. DOE proposes that this procedure for gas standing pilot lights provides an approach for calculating standby mode and off mode power consumption on a per-cycle energy-use basis.

Whirlpool commented that standing (*i.e.,* continuously burning) pilot lights are not allowed in gas dryers and that it was unclear why DOE was referring to them in this context. (Whirlpool, TP No. 9 at p. 2) The Federal standards prohibiting such pilot lights were established by the NAECA amendments to EPCA for gas clothes dryers manufactured after January 1, 1988. (42 U.S.C. 6295(g)(3)) However, the subsequent energy conservation standards rulemaking for clothes dryers amended those standards to require performance standards for all product classes of clothes dryers, including gas clothes dryers, based on EF, for clothes dryers manufactured on or after May 14, 1994. The amended energy conservation standards replaced the previous standards, and thus eliminated the prohibition of standing pilot lights. (56 FR 22250 (May 14, 1991)); 10 CFR 430.32(h)(1)). Although DOE is unaware of any current models of gas clothes dryers incorporating standing pilot lights, the methodology for measuring the energy consumption of such a feature is included in the current DOE clothes dryer test procedure because standing pilot lights are not precluded by the standards. For this reason, DOE continues to consider the methodology for incorporating standing pilot light annual energy use in the EF metric for gas dryers a viable approach for incorporating the annual energy use of modes other than active mode into the per-cycle energy-use metric.

In the existing test procedure, energy use per cycle for continuously burning pilot lights is calculated by multiplying the energy use measured for a period of one hour by an established number of hours per year that the dryer is not in drying mode, and dividing by the

representative average cycles per year. The existing test procedure established that a gas clothes dryer is in the drying mode 140 hours per year, and that the balance of the year (8,620 hours) is the established number of hours associated with the pilot light energy consumption.

DOE proposed in the December 2008 TP NOPR to adopt a similar approach for measuring energy consumption during standby and off modes for clothes dryers. Specifically, DOE proposed to adopt the current 140 hours associated with drying (*i.e.,* the active mode) and to associate the remaining 8,620 hours of the year with the standby and off modes. Table 0.2 presents the comparison of the approximate wattages and annual energy use associated with all modes that DOE proposed in the December 2008 TP NOPR. 73 FR 74639, 74647–48 (Dec. 9, 2008).

TABLE 0.2—DOE ESTIMATE OF ANNUAL ENERGY USE OF CLOTHES DRYER MODES

Mode	Hours	Typical Power *(W)*	Annual Energy Use *(kWh)*
Active	140	6,907	967.
Delay Start	*34	3	0.1.
Cycle Finished	**429	3	1.
Off and Inactive	†8,157	0.5 to 3	4 to 24.

*5 minutes per cycle × 416 cycles per year
**5 percent of remaining time (0.05 × (8,760 − 140 − 34) = 429)
†95 percent of remaining time (0.95 × (8,760 − 140 − 34) = 8,157)

GE and AHAM commented that the 0.5 to 3 W range provided for standby modes is typical for displays on appliances. (GE, Public Meeting Transcript, TP No. 8 at p. 113; AHAM, Public Meeting Transcript, TP No. 8 at pp. 113–114.)

At the December 17 Public Meeting, AHAM expressed general support of the DOE estimates of energy use. (AHAM, Public Meeting Transcript, TP No. 8 at p. 122.) Whirlpool commented that work carried out among AHAM members has included the development of a representative allocation of hours to the applicable clothes dryer operating modes. (Whirlpool, TP No. 9 at p. 3.) The data Whirlpool provided for this allocation are reproduced as Table 0.3 below.

TABLE 0.3—WHIRLPOOL-SUPPLIED ESTIMATE OF ANNUAL HOURS FOR CLOTHES DRYER MODES

DOE proposal	Whirlpool/AHAM definition	Whirlpool hours
Active	Active	140 (20 minutes per cycle).
Inactive	Standby	Assume equal to Delay Start.
Cycle Finished	Active	416 (1 hour/cycle).
Delay Start	Active	69 (10 minutes/cycle).
Off	Off	Balance [8,066].

The Whirlpool data confirm DOE's selection of 140 hours for active drying mode. The key difference between the hours proposed by DOE and Whirlpool is that Whirlpool allocates only 10 minutes per cycle to inactive mode (69 hours annually), resulting in 8,066 hours allocated to off mode. DOE believes that the proposed definition of off mode as applied to clothes dryers refers to dryers with mechanical rather than electronic controls or to dryers with electronic controls that have a mechanical switch with which the user can de-energize the electronic controls. Reactivation of the dryer with a pushbutton sensor, touch sensor, or other similar device that consumes power is considered to be a standby mode feature under the proposed definition, in which one possible standby mode "facilitate[s] the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, timer." 10 CFR part 430, subpart B, appendix D1, proposed section 1.19 and appendix F, proposed section 1.5. Based on DOE's tests, it concluded that there are few clothes dryers with electronic controls that have this additional mechanical switch. Therefore, the combined inactive/off hours would most likely be allocated fully either to inactive or off mode, depending on the type of controls present on the clothes dryer. DOE does not have market share information to determine how many clothes dryers are currently shipped with electromechanical controls, but DOE believes that the relative proportion of inactive and off mode annual hours as contained in Whirlpool's data submission may not be wholly representative of the relative shipments of clothes dryers with electronic and electromechanical controls because it implies that virtually all clothes dryers would be equipped with electromechanical controls, and DOE's review of clothes dryer models currently available does not support such a conclusion. For this reason, DOE believes that, under the proposed definitions of standby and off modes, the allocation of annual hours to inactive and off modes are appropriate and this SNOPR does not affect DOE's proposal in the December 2008 TP NOPR for this allocation of hours.

In the December 2008 TP NOPR, DOE proposed an alternative simplified methodology for allocating annual hours. 73 FR 74639, 74648 (Dec. 9, 2008). The comparison of annual energy use of different clothes dryer modes shows that delay start and cycle finished modes represent a negligible percentage of total annual energy consumption. In addition, for clothes dryers currently on the market, power levels in these modes are similar to those for off/inactive modes. Therefore, DOE proposed that all of the non-active hours (which total 8,620) would be allocated to the inactive and off modes. 73 FR 74639, 74648 (Dec. 9, 2008). AHAM commented that it supports the alternative approach, but that the delay start and cycle finished mode hours more appropriately would be combined with the active mode hours than with the inactive and off mode hours.

(AHAM, Public Meeting Transcript, TP No. 8 at p. 123; AHAM, TP No. 10 at p. 6.) As discussed in section III.B.2, DOE has determined that delay start and cycle finished modes are not standby modes according to the definitions proposed in today's SNOPR. Therefore, DOE is not proposing to combine delay start and cycle finished mode hours with active mode hours as commented by AHAM. However, because the power consumption of clothes dryers operating in such modes approximates the power levels in off/inactive modes, it would be more appropriate under a simplified approach to allocate the hours associated with delay start and cycle finished modes to off/inactive modes. Therefore, in today's SNOPR, because DOE is not proposing amendments to the clothes dryer test procedure to measure delay start and cycle finished power consumption, DOE is proposing to maintain the estimate of 8,620 hours as the non-active hours that would be allocated to inactive and off modes for clothes dryers.

In the December 2008 TP NOPR, DOE proposed to allocate the number of hours for the combined off and inactive modes entirely to either off mode or standby mode, as appropriate, if only one of these modes is possible for the clothes dryer. DOE noted in the October 2008 TP NOPR that information to guide allocation of the hours for clothes dryers that have both inactive and off modes is currently unavailable. Two operational scenarios exist: (1) A clothes dryer reverts to an off mode after a specified time in inactive mode; or (2) a clothes dryer stays in inactive mode unless the user switches the appliance back to off mode. DOE does not have information regarding the percentage of clothes dryers being sold that fall into each of these categories. Because of this limitation, DOE proposed in the October 2008 TP NOPR to allocate half of the hours determined for off/inactive modes to each of the two modes. 73 FR 74639, 74648 (Dec. 9, 2008). Because of DOE's interpretation of the inactive and off mode data supplied by Whirlpool as not being representative of typical inactive and off mode hours under the EPCA mode definitions, and in the absence of additional data regarding allocation of hours, this SNOPR does not affect DOE's proposal in the December 2008 TP NOPR for the allocation of hours between inactive mode and off mode.

DOE recognizes that the analysis of the number of annual hours allocated to each clothes dryer mode are based, in part, on the number of annual use cycles. Although, as discussed in section III.C.5.a, DOE believes that the average number of annual cycles is currently 283 rather than the 416 cycles specified in the current DOE clothes dryer test procedure, DOE does not have any information on whether active mode cycle times may have changed accordingly. It is possible that the smaller number of use cycles may correspond to larger load sizes and thus, potentially, longer drying times. Therefore, in consideration of Whirlpool's data submittal which supported DOE's estimate of 140 hours in active mode, DOE is proposing in today's SNOPR the same allocation of hours for inactive mode and off mode that were proposed in the December 2008 TP NOPR even though it is proposing fewer annual use cycles.

In summary, DOE is proposing to amend the clothes dryer test procedure to calculate clothes dryer energy use per cycle associated with inactive and off modes by: (1) Calculating the product of wattage and allocated hours for inactive and off modes, depending on which of these modes are possible; (2) summing the results; (3) dividing the sum by 1,000 to convert from Wh to kWh; and (4) dividing by 283 cycles per year. The 8,620 hours for off/inactive modes would be allocated entirely to either off mode or inactive mode, as appropriate, if only one of these modes is possible for the clothes dryer. If both modes were possible, the hours would be allocated to each mode equally as discussed above in this section, and each would be allocated 4,310 hours.

b. Room Air Conditioners

In the December 2008 TP NOPR, DOE stated it was not aware of reliable data for hours spent in different standby and off modes in room air conditioners. Therefore, DOE estimated the annual hours for standby and off modes and the relative magnitude of annual energy use in standby and off modes in an example for a representative 8,000 Btu/hour (Btu/h), 9 EER unit that has delay start, off-cycle, and inactive modes. 73 FR 7439, 74648–49 (Dec. 9, 2008). DOE's estimates of annual energy use in each mode are shown in Table 0.4.

TABLE 0.4—DOE ESTIMATE OF ANNUAL ENERGY USE OF ROOM AIR CONDITIONER MODES FOR A REPRESENTATIVE UNIT WITH 8,000 BTU/H CAPACITY AND 9 EER

Mode	Hours	Typical Power *(W)*	Annual Energy Use *(kWh)*
Active Cooling	750	889	667
Delay Start	90	2	0.2
Off-Cycle	440	2	0.9
Off and Standby	4,850	0.5 to 2	2.5 to 10

In the December 2008 TP NOPR, DOE presented an alternative simplified methodology. Similar to the analysis for clothes dryers, the comparison of annual energy use of different room air conditioner modes shows that delay start and off-cycle modes represent a small percentage of annual energy use in the active mode, and that the power consumption in those standby modes are distinct from but comparable to those for off/inactive modes. Thus, DOE proposed adopting an alternative approach focusing only on off and inactive modes. In that case, the non-active hours are allocated as if the room air conditioner has only the inactive standby mode. A total of 5,115 hours would be allocated to the standby and off modes ($8{,}760 \times 0.75 - 750 - 705 = 5{,}115$).[20] 73 FR 74639, 74649 (Dec. 9, 2008). AHAM and GE support this alternative proposal, with the clarification that the off-cycle and delay start hours should be considered part of the active mode hours rather than part of the standby or off mode hours. (AHAM, Public Meeting Transcript, TP No. 8 at p. 130; AHAM, TP No. 10 at p. 6; GE, Public Meeting Transcript, TP No. 8 at p. 131.) In today's SNOPR, because DOE is not proposing amendments to the room air conditioner test procedure to measure delay start and off-cycle power consumption, DOE is proposing the estimate of 5,115 hours as the non-active hours that would be allocated to inactive and off modes for

[20] Multiplying by 0.75 eliminates hours associated with unplugged hours, assumed for half of the hours of the year for half of room air conditioners as described in the December 2008 TP NOPR (73 FR 74639, 74648 (Dec. 9, 2008)); 750 = Cooling (active mode) hours; 705 = Fan-only (active mode) hours.

room air conditioners. For the same reasons as discussed for delay start and cycle finished modes for clothes dryers, DOE believes that the delay start and off-cycle hours for room air conditioners should be allocated to inactive and off modes even though it has determined that delay start and off-cycle modes are not standby modes.

Typically, room air conditioners with remote control can be controlled whenever they are plugged in; hence, these units do not have provision for an off mode in addition to inactive mode. However, if a room air conditioner allows the user to switch off remote control operation, such a product would be capable of both off and inactive modes. DOE notes that information to guide allocation of the hours for room air conditioners that have both inactive and off modes is currently unavailable. For these units, DOE proposed in the December 2008 TP NOPR that the off/inactive hours are allocated equally to the off and inactive modes for such a product. Otherwise, for units that are capable of operation in only off or inactive mode, DOE proposed that all of the hours be allocated to the appropriate mode. 73 FR 74639, 74649 (Dec. 9, 2008). In the absence of comments on or additional data regarding allocation of hours, this SNOPR does not affect DOE's proposal in the December 2008 TP NOPR for the allocation of hours between inactive mode and off mode.

In summary, DOE is proposing to amend the room air conditioner test procedure to calculate room air conditioner annual energy use associated with inactive and off modes by: (1) Calculating the products of wattage and allocated hours for inactive and off modes, depending on which of these modes is possible; (2) summing the results; and (3) dividing the sum by 1,000 to convert from Wh to kWh. The 5,115 hours for off/inactive modes would be allocated entirely to either off mode or inactive mode, as appropriate, if only one of these modes is possible for the room air conditioner. If both modes were possible, the hours would be allocated to each mode equally as discussed above in this section, and each would be allocated 2,557.5 hours.

5. Measures of Energy Consumption

The DOE test procedures for clothes dryers and room air conditioners currently provide for the calculation of several measures of energy consumption. For clothes dryers, the test procedure incorporates the following: Various measures of per-cycle energy consumption; including total per-cycle electric dryer energy consumption; per-cycle gas dryer electrical energy consumption; per-cycle gas dryer gas energy consumption; per-cycle gas dryer continuously burning pilot light gas energy consumption; total per-cycle gas dryer gas energy consumption expressed in Btu; and total per-cycle gas dryer gas energy consumption expressed in kWh. 10 CFR part 430, subpart B, appendix D, sections 4.1–4.5. The test procedure also provides an EF, which is equal to the clothes load in pounds divided either by the total per-cycle electric dryer energy consumption or by the total per-cycle gas dryer energy consumption expressed in kWh. 10 CFR 430.23(d). For room air conditioners, the test procedure calculates annual energy consumption in kWh and an EER. 10 CFR 430.23(f).

Under 42 U.S.C. 6295(gg)(2)(A), EPCA directs that the "[t]est procedures for all covered products shall be amended pursuant to section 323 to include standby mode and off mode energy consumption * * * with such energy consumption integrated into the overall energy efficiency, energy consumption, or other energy descriptor for each covered product, unless the Secretary determines that—(i) the current test procedures for a covered product already fully account for and incorporate the standby mode and off mode energy consumption of the covered product; or (ii) such an integrated test procedure is technically infeasible for a particular covered product, in which case the Secretary shall prescribe a separate standby mode and off mode energy-use test procedure for the covered product, if technically feasible."

As part of the December 2008 TP NOPR DOE explored whether the existing measures of energy consumption for clothes dryers and room air conditioners can be combined with standby mode and off mode energy use to form a single metric. For the reasons presented in the December 2008 TP NOPR, DOE proposed combined metrics addressing active, standby, and off modes for clothes dryers and room air conditioners, as discussed below.

a. Clothes Dryers

In the December 2008 TP NOPR, DOE proposed to establish the following measures of energy consumption for clothes dryers that integrate energy use of standby and off modes with energy use of main functions of the products. "Per-cycle integrated total energy consumption expressed in kWh" will be defined as the sum of per-cycle standby and off mode energy consumption and either total per-cycle electric dryer energy consumption or total per-cycle gas dryer energy consumption expressed in kWh, depending on which type of clothes dryer is involved. "Integrated energy factor" (IEF) will be defined as the (clothes dryer test load weight in lb)/(per-cycle integrated total energy in kWh). 73 FR 74639, 74650 (Dec. 9, 2008).

b. Room Air Conditioners

In the December 2008 TP NOPR, DOE proposed to establish the following measures of energy consumption for room air conditioners that integrate energy use of standby and off modes with energy use of main functions of the products. "Integrated annual energy consumption" will be defined as the sum of annual energy consumption and standby and off mode energy consumption. "Integrated energy efficiency ratio" (IEER) will be defined as (cooling capacity in Btu/hr $\times$ 750 hours average time in cooling mode)/(integrated annual energy consumption $\times$ 1,000 Wh per kWh). 73 FR 74639, 74650 (Dec. 9, 2008).

AHAM, Whirlpool, and GE all supported the proposed integrated measures of energy consumption and energy efficiency for clothes dryers and room air conditioners combining standby mode and off mode energy consumption with active mode energy consumption. (AHAM, TP No. 10 at p. 6; Whirlpool, TP No. 9 at p. 3; GE, TP No. 11 at p. 1) PG&E and ACEEE both commented that an integrated metric for these products is largely irrelevant. (PG&E, Public Meeting Transcript, TP No. 8 at p. 147, ACEEE, Public Meeting Transcript, TP No. 8 at pp. 146–147) PG&E recognizes the legal requirements and limitations, but it does not support an integrated metric. It stated that many of the covered appliances use a large amount of energy in active mode and only a small amount in standby mode. PG&E also commented that the measurements of energy use in active and standby mode can be combined, but the cost of reducing standby mode energy use, which is small but could be made smaller very inexpensively, is low. PG&E suggested a prescriptive limit on standby power or a voluntary agreement for a standby power limit. (PG&E, Public Meeting Transcript, TP No. 8 at pp. 143–144) ACEEE stated that the public policy objective in EISA 2007 was to encourage limitations of the amount of energy wasted when a covered product is not in active mode, regardless of the type of product. ACEEE believes that it would be more straightforward to simply place a limitation on the wattage at each of these non-operating cycle conditions, which would encourage manufacturers to incorporate low-standby-power

components such as improved power supplies. ACEEE also commented that it is not sure why DOE is mixing in source use of gas with site use of electricity to present integrated measures that do not help minimize the relatively small contributions of non-duty cycle energy use. ACEEE believes such an approach is not technically feasible unless all energy is site use because of the many disagreements about the appropriate site-to-source conversions and because these conversions vary so much among regions and times of day. (ACEEE, Public Meeting Transcript, TP No. 8 at pp. 140–142)

EPCA directs that standby mode and off mode energy consumption be integrated into the overall energy efficiency, energy consumption, or other energy descriptor for each product unless the Secretary determines—(i) The current test procedure already fully accounts for and incorporates the standby mode and off mode energy consumption; or (ii) such an integrated test procedure is technically infeasible (42 U.S.C. 6295(gg)(2)(A)). DOE tentatively determined in the December 2008 TP NOPR that it is technically feasible to integrate standby mode and off mode energy consumption into the overall energy consumption metrics for clothes dryers and room air conditioners. 73 FR 74639, 74650 (Dec. 9, 2008). In the case of clothes dryers, the DOE test procedure already allows for a measure of standby power (*i.e.,* pilot gas consumption) to be incorporated into EF. For both clothes dryers and room air conditioners, the difference in energy use in active and standby modes is so large that standby power has little impact on the overall measure of energy efficiency. Therefore, it is technically feasible for both products to integrate standby and off mode power into the energy-use metric. While DOE recognizes that a prescriptive standard for standby and off mode power could have certain advantages for products such as clothes dryers and room air conditioners in which energy use in such modes represents such a small percentage of annual energy use in the active mode, EISA 2007 provides a clear requirement for an integrated metric where technical feasibility for such incorporation is determined. In response to ACEEE's comment regarding the technical feasibility of mixing source use of gas with site use of electricity to present integrated measures of energy use, DOE notes that the current DOE clothes dryer test procedure only considers gas use at the appliance site, precluding the need for a site-to-source conversion factor. Since the test procedure already incorporates both electrical energy consumption and gas energy consumption for gas clothes dryers, converting the gas energy consumption metric, Btu/h, to kWh to obtain total energy consumption, DOE concludes that considering additional electricity or gas usage during standby mode or off mode would also be technically feasible.

DOE was also made aware that the Air-Conditioning, Heating and Refrigeration Institute (AHRI) Standard 340/360–2007, "Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment," (AHRI Standard 340/360) and the ASHRAE Standard 90.1–2007, "Energy Standard for Buildings Except Low-Rise Residential Buildings," (ASHRAE 90.1) both published in 2007, included an IEER metric, also named "Integrated Energy Efficiency Ratio," which is meant to rate the part-load performance of the air-conditioning equipment under test. Manufacturers of the equipment covered by these standards currently list IEER ratings in their product literature and in the AHRI certified product directory. This IEER metric does not integrate standby mode and off mode energy use, as is being proposed in today's SNOPR. Because the IEER metric used in AHRI Standard 340/360 and ASHRAE 90.1 was established prior to the IEER proposed in this rulemaking, DOE is proposing for today's SNOPR to revise the name of the integrated metrics incorporating standby mode and off mode energy use to "combined" metrics for both clothes dryers and room air conditioners.

For these reasons, today's SNOPR proposes to incorporate into the DOE test procedures the "per-cycle combined total energy consumption expressed in kWh" and "combined energy factor" (CEF) for clothes dryers and "combined annual energy consumption" and "combined energy efficiency ratio" (CEER) for room air conditioners as were proposed in the December 2008 TP NOPR. 73 FR 74639, 74650 (Dec. 9, 2008).

AHAM and GE noted that DOE did not propose in the December 2008 TP NOPR to amend the annual energy cost calculations for room air conditioners in 10 CFR 430.23 to include the cost of standby mode and off mode energy use. (AHAM, Public Meeting Transcript, TP No. 8 at pp. 164–165; GE, Public Meeting Transcript, TP No. 8 at p. 164) AHAM stated that such an annual energy cost should be obtained by multiplying the integrated annual energy consumption from the new method by the representative average unit cost of electrical energy in dollars per kWh. (AHAM, TP No. 10 at p. 6) DOE is not proposing to amend the annual energy cost calculations in 10 CFR 430.23 for clothes dryers and room air conditioners to include the cost of energy consumed in standby and off modes because:

- EPCA as amended by EISA does not require DOE to include standby and off mode energy costs in the annual energy cost calculation; and
- The Federal Trade Commission's (FTC's) EnergyGuide Label for room air conditioners includes as an indicator of product energy efficiency the annual energy cost, compared to a range of annual energy costs of similar products. Appendix E to 16 CFR part 305. An annual energy cost incorporating standby and off mode energy would no longer be directly comparable to the minimum and maximum energy costs prescribed for the EnergyGuide Label. Clothes dryers are not covered products for the EnergyGuide Label.

C. Clothes Dryer and Room Air Conditioner Active Mode Test Procedures

1. Correction of Text Describing Energy Factor Calculation for Clothes Dryers

DOE proposed in the December 2008 TP NOPR to correct certain errors contained in specific references used in the current DOE test procedure regulation. 73 FR 74639, 74650 (Dec. 9, 2008). In particular, the reference to sections 2.6.1 and 2.6.2 of 10 CFR part 430, subpart B, appendix D in the calculation of EF for clothes dryers found at section 430.23(d)(2) was determined to be incorrect and should refer instead to sections 2.7.1 and 2.7.2. Section 2.6 provides instructions for the test clothes to be used in energy testing of clothes dryers, whereas section 2.7 provides instructions on test loads. The EF of clothes dryers is measured in lbs of clothes per kWh. Since the EF calculation requires the weight of the test load, DOE proposed in the December 2008 TP NOPR to correct these references in 10 CFR 430.23(d)(2). DOE did not receive any comments opposing this correction. Therefore, this SNOPR does not affect DOE's proposal in the December 2008 TP NOPR for this same correction.

2. Automatic Cycle Termination for Clothes Dryers

In the October 2007 Framework Document, DOE stated that it believes that the clothes dryer test procedure may not adequately measure the benefits of automatic cycle termination, in which a sensor monitors either the exhaust air temperature or moisture in

the drum to determine the length of the drying cycle. (Framework Document, STD No. 1 at p. 5.) Currently, the test procedure provides a single credit for the enhanced performance of clothes dryers equipped with automatic termination but does not distinguish between the type of sensing control system (*e.g.,* temperature-sensing or moisture-sensing controls) and the sophistication and accuracy of the control system. The current clothes dryer test procedure provides a credit in the calculation of EF for clothes dryers equipped with an automatic cycle termination feature, defined in terms of an FU scaling factor applied to the per-cycle drying energy consumption. Gas or electric clothes dryers with time termination control (*i.e.,* those dryers equipped only with a timer to determine the end of a drying cycle) are assigned an FU of 1.18, while dryers with automatic termination are assigned an FU of 1.04. Therefore, clothes dryers with automatic cycle termination control receive a 12-percent credit as compared to a comparable dryer with time termination control, which is assumed to consume more energy due to over- or under-drying, which in the latter case can result in consumers running an additional drying cycle. DOE sought comment in the October 2007 Framework Document on such a test procedure revision.

In response to the October 2007 Framework Document, AHAM, Edison Electric Institute (EEI), Alliance Laundry Systems (ALS), and the Consortium for Energy Efficiency (CEE) commented that the clothes dryer test procedure should be changed to account for the use of automatic cycle termination. (AHAM, STD No. 8 at p. 2; EEI, STD No. 5 at p. 2; ALS, STD No. 6 at p. 1; CEE, STD No. 10 at p. 2.)[21] Whirlpool commented that automatic cycle termination reduces over- or under-drying. According to Whirlpool, over-drying wastes energy directly, and under-drying leads to consumer use of a second clothes-drying cycle. Whirlpool believes that the test procedure should credit both temperature sensing and moisture sensing automatic termination and, because moisture sensing is less subject to over- or under-drying, this approach should receive greater credit. Whirlpool added that it would need additional time to evaluate a specific recommendation on the nature of the credit. (Whirlpool, STD No. 7 at p. 2.)

The ACEEE, Appliance Standards Awareness Project (ASAP), Natural Resources Defense Council (NRDC), and the Northwest Power and Conservation Council (NPCC) (hereafter "Joint Comment") stated in jointly filed comments that DOE should verify the benefits of automatic cycle termination for clothes dryers and that testing should be conducted on new and accelerated-use models to verify long-term effectiveness. The Joint Comment added that the test procedure should not provide any "default" efficiency credit for reduced cycle time unless such benefits have been verified through actual testing. (Joint Comment, STD No. 9 at p. 13.) At the October 24, 2007 framework document public meeting, ACEEE questioned whether the current DOE clothes dryer test procedure allows for ambiguity or less-than-optimum results in terms of cycle termination when the clothes are defined to be dry. (ACEEE, Public Meeting Transcript, STD No. 4.6 at p. 36.)[22]

Based on comments received in response to the October 2007 Framework Document, DOE agrees that the benefit of automatic cycle termination should be more accurately credited, and that this credit should account for any over- or under-drying. Therefore, DOE considered potential amendments to the DOE test procedure to account for automatic cycle termination. DOE investigated other clothes dryer test procedures for measuring the effectiveness of automatic cycle termination and conducted limited testing to analyze over-drying energy consumption and the applicability of the proposed amendments to the DOE clothes dryer test procedure.

DOE reviewed industry and international clothes dryer test standards for testing methods and procedures for evaluating clothes dryers that use automatic cycle termination. DOE noted that AHAM recently published an update to its industry test standard, AHAM HLD–1–2009, "Household Tumble Type Clothes Dryers" (AHAM Standard HLD–1–2009), which contains provisions for measuring the over-drying energy consumption for dryers that use automatic cycle termination. DOE also noted that the international test standards EN Standard 61121 and AS/NZS Standard 2442.1 both address methods for testing dryers with automatic termination sensor technologies. EN Standard 61121 is used in European Union (EU) member countries. DOE notes that this test standard appears to be identical to the IEC Standard 61121, which is used in other countries such as China.

As noted above, DOE reviewed the recently issued AHAM Standard HLD–1–2009, which provides separate testing procedures for automatic termination sensing dryers and timer dryers. For timer dryers, AHAM Standard HLD–1–2009 requires that the test cycle (with the temperature set to maximum) is run until the load is dried to 5-percent ± 1-percent RMC, which can be determined from experience or continuous weighing. The test procedure in AHAM Standard HLD–1–2009 for automatic termination sensing dryers requires that the dryer be operated at the maximum temperature setting and the test cycle is stopped when it just reaches cool down. If the RMC is less than 6 percent, then the test is valid and is repeated two more times. AHAM Standard HLD–1–2009 allows automatic termination sensing dryers to dry the test load to any value below 6-percent RMC, and the total energy consumption and final RMC are recorded. DOE notes that the procedures for timer dryers and automatic termination sensing dryers both require that the initial RMC of the test load be 70 percent ± 5 percent.

Annex H of AHAM Standard HLD–1–2009 contains moisture removal datasheet tables that can be used to record testing data. As noted above, the test requires that the total energy input and the final RMC be recorded at the end of the test cycle for both timer dryers and automatic termination sensing dryers. Table H.2 of annex H, which includes test values to record for automatic termination sensing dryers, requires that the time to dry to 5-percent RMC and total energy to reach 5-percent RMC be recorded. This table indicates that the time to dry the test load to 5-percent RMC can be estimated using dynamic scale recording and that the total energy to reach 5-percent RMC can be estimated using dynamic energy

[21] A notation in the form "AHAM, STD No. 8 at p.2" identifies a written comment that DOE has received and has included in the docket of the energy conservation standards rulemaking for clothes dryers and room air conditioners (Docket No. EE–2007–STD–0010). This particular notation refers to a comment (1) submitted by the Association of Home Appliance Manufacturers (AHAM), (2) in document number 8 in the docket of that rulemaking, and (3) appearing on page 2 of document number 8.

[22] A notation in the form "ACEEE, Public Meeting Transcript, STD No. 4.6, p. 36" identifies an oral comment that DOE received during the October 24, 2007, framework public meeting and that was recorded in the public meeting transcript in the docket for the energy conservation standards rulemaking for clothes dryers and room air conditioners (Docket No. EE–2007–STD–0010), maintained in the Resource Room of the Building Technologies Program. This particular notation refers to a comment (1) made by the American Council for an Energy Efficient Economy (ACEEE) during the public meeting, (2) recorded in document number 4.6, which is the public meeting transcript that is filed in the docket of that rulemaking, and (3) which appears on page 36 of document number 4.6.

recording and the time determined above. From this, the over-drying energy loss is calculated by subtracting the total energy to reach 5-percent RMC from the total measured energy input. Therefore, an automatic termination-sensing dryer that dries the test load to between 5- and 6-percent final RMC would have no over-drying energy consumption. DOE believes that AHAM Standard HLD–1–2009 provides a clear methodology for measuring the over-drying energy consumption for automatic termination sensing dryers and provides a means for comparing the accuracy of different automatic termination sensor technologies used in different clothes dryer models. However, DOE believes that AHAM Standard HLD–1–2009 does not provide an appropriate method for comparing the amount of over-drying for a timer dryer to that of an automatic termination-sensing dryer. According to the methods in AHAM Standard HLD–1–2009, a timer dryer could appear to consume less energy, and thus appear more efficient, than an automatic termination-sensing dryer since the timer dryer test only allows for drying the test load to as low as 4-percent RMC, whereas the automatic cycle termination test would allow for drying the test load to any value below 6-percent RMC, including lower than 4-percent RMC.

DOE reviewed EN Standard 61121, which defines "automatic tumble dryer," as a dryer "which switches off the drying process when a certain RMC of the load is reached," and "non-automatic tumble dryer," as a dryer "which does not switch off the drying process when a certain RMC of the load is reached, usually controlled by a timer, but may also be manually controlled." The testing procedures in section 9 of EN Standard 61121 require that, for automatic termination control dryers, a program is selected which achieves the final RMC value given in Table 3 in the test standard.[23] The test standard adds additional clarification, stating that the test cycle be repeated using a different program if the program selected does not dry the test load to the specified RMC, and that if no program is available to dry the test load to the specified RMC, this fact is reported and the test is stopped. Section 9 of EN Standard 61121 also states that for non-automatic (timer) dryers, the dryer is operated for as long as required to achieve the final RMC specified in Table 3 in the test standard. The test standard adds that if the dryer does not reach the RMC after its maximum programmed time, this fact is reported and the test is stopped. DOE notes that although EN Standard 61121 provides descriptions of the test methods to use for each type of dryer, it does not provide any methodology to account for the energy consumed over- or under-drying the test load beyond a certain RMC for each type of dryer. According to the test procedures in EN Standard 61121, if the test load is dried to the same RMC, and therefore consumed the same amount of energy during the test cycle, a timer dryer and automatic termination control dryer would appear to consume the same amount of energy in real world use.

DOE also reviewed AS/NZS Standard 2442.1 for potential amendments to the DOE test procedure to more properly account for automatic cycle termination. DOE noted that AS/NZS Standard 2442.1 provides similar definitions of types of dryers as provided by EN Standard 61121, including "manual dryer," "timer dryer," and "autosensing dryer." In particular, AS/NZS Standard 2442.1 defines "autosensing dryer" as a dryer that can be preset to carry out at least one sequence of operations to be terminated by means of a system assessing, directly or indirectly, the RMC of the load. AS/NZS Standard 2442.1 also provides that when the drying temperature can be chosen independently of the program of an autosensing dryer, it shall be set to the maximum. DOE also notes that the combined definitions of manual and timer dryer in AS/NZS Standard 2442.1 are equivalent to the definition of "non-automatic tumble dryer" in EN Standard 61121.

AS/NZS Standard 2442.1 provides separate testing methods for manual/timer dryers and automatic termination control dryers, for which DOE noted the following differences. The manual/timer dryer test procedure requires that two test cycles be conducted. For the first test cycle, the dryer is operated until the RMC is greater than 6 percent and less than 7 percent. The test procedure is then repeated to obtain an RMC greater than 5 percent and less than 6 percent. In both cases, the test cycle is not allowed to advance into the cool-down period. From these results, the energy consumption required to obtain a final RMC of exactly 6 percent is linearly interpolated. The automatic termination control dryer test procedure requires that a drying program be selected to achieve a final RMC below 6 percent. The test cycle is run until immediately before the cool-down period begins. AS/NZS Standard 2442.1 allows for any final RMC value below 6 percent for automatic termination control dryers. If the RMC of the test load is above 6 percent for such a dryer, the test is invalid and a new test is run with a different drying program setting. For the automatic termination control dryer test, the moisture removed from the load and the energy consumed to reach the measured final RMC are recorded. DOE notes that the automatic termination control dryer test procedure does not provide a calculation for determining the energy consumption to obtain a final RMC of exactly 6 percent, as is done in the timer dryer test procedure.

AS/NZS Standard 2442.2 sets out the equations and procedures for calculating the values of the comparative energy consumption. The comparative energy consumption, which is determined through the projected annual energy consumption, includes an FU factor which accounts for the over-drying of clothes by manual/timer dryers. According to AS/NZS Standard 2442.2, the FU factor is equal to 1.1 for manual/timer controlled dryers and 1.0 for automatic termination control dryers; these values were estimated from research obtained in the United States. DOE notes that the AS/NZS Standard 2442.2 also provides a calculation for the "tested energy performance," which is the tested energy consumption divided by the mass of moisture removed. However, DOE notes that AS/NZS Standard 2442.2 only uses this value as a check, requiring only that the tested energy performance be less than 1.36 kilowatt hour (kWh) per kilogram (kg) of moisture removed. Therefore, DOE believes that for autosensing dryers the calculation for the comparative energy consumption, which is independent of the tested energy performance, takes into consideration the amount of energy consumed over-drying the test load below 6-percent RMC during the test cycle by simply adding this energy consumption to the overall annual energy consumption.

DOE was made aware in discussions with an Australian clothes dryer manufacturer that the 1.1 FU factor for timer dryers in the calculation of comparative energy consumption in AS/NZS Standard 2442.2 was questioned in the past by interested parties involved in the development of Australia/New Zealand testing standards as possibly being too low. However, DOE was informed that limited studies were conducted by interested parties that showed that this value was still appropriate, and, therefore, DOE is not proposing a different FU factor for timer dryers. As discussed later in this

[23] Table 3 of EN Standard 61121 specifies the final moisture content of the test load after drying for "dry cotton" programme as 0 percent with an allowable range of ±3 percent.

section, DOE is requesting comment on the FU factor for timer dryers.

DOE notes that appendix E of AS/NZS Standard 2442.1 provides specifications for the preparation of the standard damp test load, in which the load is soaked in a clothes washer for 10 minutes and then the water is extracted by a normal spin operation to reduce the RMC of the test load to between 85 and 90 percent. This process is similar to the test load preparation outlined in the DOE test procedure (with different RMC values and soaking times). However, AS/NZS Standard 2442.1 then requires that a final mass adjustment be made, such that the initial RMC of the test load is 90 percent (190 percent ± 0.02 kg of the bone dry weight) by adding water uniformly to the load in a very fine spray. Although AS/NZS Standard 2442.1 requires a much higher RMC than is representative of actual clothes washer loads, DOE still believes that the final mass adjustments to achieve a more exact initial RMC in AS/NZS Standard 2442.1 would improve the repeatability and help to reduce variation from test to test. DOE believes this would also allow for a more representative comparison (without the use of RMC correction factors for automatic termination control dryers based on limited test data) between timer dryers and automatic termination control dryers.

DOE believes that AS/NZS Standard 2442 provides testing methods and procedures which accounts for the amount of over-drying associated with automatic termination control dryers beyond a specified RMC, and effectively takes into consideration the accuracy of different automatic termination sensor technologies. DOE also believes that the testing methods provide an accurate and representative method for comparing the energy consumption between timer dryers and automatic termination control dryers. For these reasons DOE proposes to amend the DOE test procedure for clothes dryers to incorporate the individual test procedures for timer dryers and automatic termination control dryers in AS/NZS Standard 2442 with modifications as appropriate for the DOE test procedure. The following discussion describes the proposed amendments.

Based on the definitions in EN Standard 61121 and AS/NZS Standard 2442, DOE proposes to define "timer dryer" as "a dryer which can be preset to carry out at least one sequence of operations to be terminated by a timer, but may also be manually controlled," and "automatic termination control dryer" as "a dryer which can be preset to carry out at least one sequence of operations to be terminated by means of a system assessing, directly or indirectly, the moisture content of the load. An automatic termination control dryer with supplementary timer shall be tested as an automatic termination control dryer."

For the reasons discussed above, DOE proposes to amend sections 2.7.1, "Compact size dryer load," and 2.7.2, "Standard size dryer load," of the DOE test procedure for clothes dryers, which contain provisions for test load preparation, to add at the end of both sections the following requirement: "Make a final mass adjustment, such that the moisture content is 47 percent ± 0.33 percent by adding water uniformly to the load in a very fine spray." The ± 0.33 percent allowable RMC range was determined based upon the allowable range specified in AS/NZS Standard 2442.1 (190 percent ± 0.02 kg of the bone dry weight) for a 7-lb test load. DOE is also proposing that the procedure for dampening and extracting water from the test load specified in the current test procedure be changed to require that the moisture content of the test load be between 42 and 47 percent of the bone-dry weight of the test load, and would serve as an initial preparation step prior to the final mass adjustments to obtain a test load with an RMC of 47 percent proposed above. DOE notes that it is proposing to use a nominal initial RMC of 47 percent based on the proposed amendment to change the initial RMC from 70 percent to 47 percent, as discussed in section III.C.5.b. If DOE does not adopt this proposed amendment to change the nominal initial RMC, it would propose for the above mentioned amendment to first prepare the test load to 65- to 70-percent RMC and make adjustments to the moisture content to get 70-percent ± 0.33-percent initial RMC.

DOE also notes that section 2.7 of the existing clothes dryer test procedure regarding test load preparation requires that the test load be agitated in water whose temperature is 100° ± 5 °F. DOE recognizes that some residential clothes washers may use a default cold rinse cycle at the end of the wash cycle, which sections 2.6.1.2.1 and 2.6.3.1 of the current DOE clothes washer test procedure specifies to be 60° ± 5 °F. However, DOE does not have any data indicating whether a different water temperature for clothes dryer test load preparation would be more representative of current consumer usage habits. For this reason, DOE is not proposing any changes to the water temperature for clothes dryer test load preparation at this time. If consumer usage data is made available that indicates a 60° ± 5 °F water temperature is more representative of consumer usage, DOE may adopt an alternate approach specifying a 60° ± 5 °F water temperature for test load preparation in section 2.7 of the DOE clothes dryer test procedure. DOE invites comment on whether the existing water temperature of 100° ± 5 °F for test load preparation in the existing test procedure is representative of consumer usage habits, and, if not, what would be a representative value. In addition, DOE is unaware of how changes to the water temperature for clothes dryer test load preparation would affect the measured efficiency as compared to the existing test procedure. For this reason, DOE also requests data quantifying how changes to the water temperature for clothes dryer test load preparation would affect the measured efficiency as compared to the existing DOE test procedure, in particular for those units that are minimally compliant with current energy conservation standards.

DOE also proposes to amend section 3.3, "Test cycle," in the DOE test procedure for clothes dryers to include testing procedures specific to each type of dryer. For timer dryers, the clothes dryer shall be operated at the maximum temperature setting and, if equipped with a timer, at the maximum time setting. The load shall be dried to 5–6 percent RMC without the dryer advancing into cool down, resetting the timer if necessary. The procedure would then be repeated until the RMC of the test load is 4–5 percent. DOE requests comment on whether using the maximum temperature setting is representative of current consumer usage habits. DOE also requests comment on whether multiple temperature settings should be evaluated and averaged, and if so, how testing multiple temperature settings would affect the measured efficiency as compared to the existing DOE clothes dryer test procedure, which only measures the clothes dryer at the maximum temperature setting.

As part of the energy conservation standards rulemaking preliminary analyses, DOE conducted testing on a representative gas clothes dryer. To support the evaluation of the testing methods for automatic termination control dryers, DOE conducted additional testing on this gas clothes dryer to evaluate the effects of program settings that provide the maximum drying temperature and maximum dryness level (*i.e.,* lowest final RMC). DOE selected these settings to remain consistent with the current DOE clothes dryer test procedure, which specifies

that the maximum temperature setting be selected for the test cycle. The tests consisted of running the clothes dryer on the cycle settings discussed above with test load initial RMCs of 70 percent ± 0.33 percent, 56 percent ± 0.33 percent, and 47 percent ± 0.33 percent, and allowing the clothes dryer to run until the heater cycles off for the the final time (*i.e.,* immediately before the cool-down period begins). For each initial RMC, three identical tests were conducted to determine the repeatability of the test results. Table 0.5 below shows the results from this testing compared to the results of testing the same gas dryer according to the current DOE test prcocedure.

TABLE 0.5—DOE AUTOMATIC CYCLE TERMINATION TEST RESULTS

Initial RMC *(%)*	Test	Final RMC *(%)*	Per-cycle energy consumption *(kWh)*
70	Automatic Cycle Termination	0.6	3.018
	Current DOE	*3.3	*2.462
56	Automatic Cycle Termination	0.6	2.559
	Current DOE	*3.7	*2.001
47	Automatic Cycle Termination	0.5	2.252
	Current DOE	*3.4	*1.754

*Current DOE test procedure normalizes the per-cycle energy consumption equation to represent the energy consumption required to dry the test load to 4-percent RMC. In addition, the current DOE test procedure multiplies the per-cycle energy consumption by a fixed field use factor of 1.04 to account for over-drying energy consumption.

DOE noted that for all of the test runs, using the maximum temperature and dryness level settings resulted in the test load being dried to near bone dry (0.4-percent to 0.7-percent RMC). Using the data of the estimated RMC of the test load measured continuously during the test cycle, as discussed below, DOE also observed that for all of the test runs, the estimated RMC of the test load was below 1-percent RMC by the time the heater began cycling on/off. The increased amount of over-drying resulted in higher energy consumption, greater than the per-cycle energy consumption resulting from the same dryer being tested according to the DOE test procedure, which uses a fixed FU factor to account for over-drying energy consumption. DOE believes that different manufacturers may target different final RMCs for their highest dryness level setting. Based on the test results for this gas clothes dryer unit, DOE believes that the highest dryness level setting may be intended to dry the clothes load to near bone dry, beyond the target RMC of the DOE test procedure, and would not be appropriate for the proposed test cycle. For this reason, DOE does not intend to propose that the highest dryness level be specified for the test cycle. DOE believes that a "normal" drying program would be more representative of consumer usage habits and would more likely dry the clothes load to the target range specified in the DOE clothes dryer test procedure.

Based on additional testing, DOE is proposing an alternative approach in which, for automatic termination control dryers, a "normal" program shall be selected for the test cycle to be most representative of consumer usage. Where the drying temperature can be chosen independently of the program, it shall be set to the maximum. When the heater switches off for the final time at the end of the drying cycle, *i.e.,* immediately before the cool-down period begins, the dryer shall be stopped. If the final RMC is greater than 5 percent, the tests shall be invalid and a new run shall be conducted using the highest dryness level setting. Any test cycle in which the final RMC is 5 percent or less shall be considered valid. DOE is also proposing that for automatic termination control dryers, the cycle setting selected for the test be recorded. This would include settings such as the drying mode, dryness level, and temperature level. DOE requests comment on whether proposed cycle and settings are representative of current consumer usage habits. DOE also requests comment on whether multiple cycles and settings should be tested and how the results from those multiple tests should be evaluated, and if so, how testing multiple cycles and settings would affect the measured efficiency as compared to the existing DOE clothes dryer test procedure, which only requires that the clothes dryer be tested at the maximum temperature setting.

DOE notes that AS/NZS Standard 2442 specifies the maximum allowable final RMC for automatic termination control dryers as 6 percent. DOE, however, is unaware of any data indicating that a final RMC of 6 percent would be representative of current consumer usage habits. DOE also notes that using 5-percent RMC, as proposed in today's SNOPR, would remain within the range specified by the current DOE test procedure, which specifies 2.5- to 5-percent final RMC. DOE seeks comment and consumer usage data on whether a 6-percent final RMC target value would be more representative of current consumer usage habits. DOE also notes that AS/NZS Standard 2442 requires an initial RMC of 90 percent. As noted in section III.C.5.b, DOE researched appropriate initial RMC values based on clothes washer shipment-weighted average RMC, and believes that a value of 47-percent RMC would be most representative of clothes loads being dried after completion of a residential clothes washer cycle.

DOE notes that there are at least two ways to terminate the drying cycle during the test: (1) Termination before cool-down, or (2) termination at the end of the selected test cycle, including cool-down. As discussed above, section 4.2 of AS/NZS Standard 2442.1 requires that for automatic termination control dryers, the programmed test cycle be run until immediately before the cool-down period begins. Similarly, section 4.5.1 of AHAM–HLD–1–2009 requires that the automatic termination control dryer test cycle not be permitted to advance into the cool-down period. Alternatively, section 9.2.1 of EN Standard 61121 requires that the selected test cycle program be allowed to run until completion, including the cool-down period. Today's SNOPR proposes automatic cycle termination based on the provisions in AS/NZS Standard 2442 because it provides a more representative comparison of the energy consumption between automatic termination control dryers and timer dryers than EN Standard 61121. In addition, the proposed amendments to stop the test cycle immediately before the cool-down period will harmonize DOE test methods with industry and international test standards. However, DOE is considering the alternative

method of section 9.2.1 of EN Standard 61121 because it may provide incentives for energy-saving improvements in dryer controls. DOE recognizes that manufacturers may design products to use the residual heat during the cool-down period (*i.e.,* immediately after the heater has switched off for the final time) to continue to dry the clothes load while slowly spinning the drum to achieve a desired RMC.[24] DOE recognizes that inclusion of the cool-down period may make it possible for some manufacturers to design dryers that attain the desired RMC with lower total energy consumption. This potential for energy efficiency improvement would not be captured by the test methods proposed in today's SNOPR. In order to capture this real-world energy savings potential associated with the additional drying using residual heat during the cool-down period, DOE could adopt an alternate approach to include the measurement of the cool-down period as part of the proposed automatic cycle termination test methodology. Under an alternate approach, section 3.3.2 of the test procedure for automatic termination control dryers, instead of specifying that "when the heater switches off for the final time, immediately before the cool-down period begins, stop the dryer," would specify to "run the clothes dryer until the programmed cycle has terminated." DOE also notes that the inclusion or exclusion of the cool-down period under the proposed test method would not affect the ability to compare energy consumption test results between automatic termination control dryers and timer dryers in DOE's clothes dryer test procedure. DOE welcomes comment on whether the cool-down period should be included as part of the active mode test cycle for automatic termination control dryers. DOE is unaware of data showing the effects of including the cool-down period on the measured efficiency as compared to the existing test procedure. For this reason, DOE also welcomes data quantifying how including the cool-down period in the test cycle would affect the measured efficiency of clothes dryers as compared to the existing DOE test procedure, in particular for those units that are minimally compliant with current energy conservation standards.

Finally, DOE proposes to revise section 4, "Calculation of Derived Results from Test Measurements," of the DOE test procedure. DOE proposes to revise the FU factor credits in the current DOE test procedure to more appropriately account for automatic termination control dryers' over-drying energy consumption. Automatic termination control clothes dryers would receive an FU factor of 1.0 (instead of the 1.04 currently provided), with any over-drying energy consumption being added to the drying energy consumption to decrement EF. Based on the proposed test methods, an automatic termination control dryer that is able to dry the test load to close to 5-percent RMC, and thus minimize over-drying, would result in a higher measured efficiency than if it over-dried the test load to an RMC less than 5 percent. The energy consumed over-drying the test load would be included in the per-cycle energy consumption, and would result in a reduction in the measured EF. For timer dryers, DOE is proposing to use the results from the proposed test cycles (5–6 and 4–5 percent final RMCs) to interpolate the value of the per-cycle energy consumption required to dry the test load to exactly 5-percent RMC. DOE invites comment on whether such methodology appropriately credits both automatic termination control and timer clothes dryers.

DOE is unaware of any data or studies that would indicate that the 1.18 FU factor credit for timer dryers (to account for over- or under-drying test loads in real-world use) is inaccurate and not currently representative of consumer usage habits. For this reason, DOE does not intend to revise the 1.18 FU factor credit for timer dryers at this time. However, DOE recognizes that this field use factor for timer dryers was established at the same time the DOE clothes dryer test procedure was established, in 1981, and may not be representative of current consumer usage patterns. DOE is open to revising this value and welcomes data and comment on whether this value is appropriate.

In support of the residential clothes dryer energy conservation standards rulemaking, DOE conducted testing of ten vented clothes dryers and two vent-less clothes dryers (one of which was not an automatic termination control dryer) at an independent testing laboratory.[25] As part of this testing, DOE conducted a limited number of preliminary automatic cycle termination tests in order to analyze the various automatic termination technologies found in DOE's sample of selected dryers. DOE selected the AHAM 8-lb test load[26] instead of the 7-lb load specified in the DOE test procedure for standard-size clothes dryers in order to lengthen the test cycle times and better evaluate the function of the dryer controls as the test load approached low RMCs. The independent test lab conducting the clothes dryer tests used a data acquisition system to monitor estimated RMC of the test load continuously during the test cycle. The system used a platform weighing scale, along with an algorithm to account for buoyancy effects of hot air in the dryer, drum rotational effects, and other proprietary factors. With this data, DOE was able to estimate when the test load reached a certain RMC and how much energy was associated with over-drying for RMCs beyond that point. However, for the vent-less clothes dryer, the test lab was unable to accurately monitor the estimated RMC of the test load continuously to analyze over-drying because the moisture removed from the clothes load remained inside the dryer cabinet until a drain pump removed it, in contrast to vented dryers in which the moisture-laden air exits the dryer cabinet through the exhaust pipe. Therefore, the scale weight measurement used to calculate the estimated RMC was not meaningful for the vent-less units.

The automatic termination tests conducted by DOE consisted of running the test cycle in a user-programmable automatic termination mode and allowing the dryer to self-terminate the drying cycle using the various automatic termination sensor technologies. DOE monitored the energy consumption and estimated RMC of the test load during the test cycle from the starting time at 70-percent initial RMC to the time when the heater last cycled off (*i.e.,* immediately before the cool-down period). The specific focus was on analyzing the amount of over-drying energy consumed drying the test load to less than 5-percent RMC. DOE also applied a correction factor to the test data to account for the fact that the automatic cycle termination tests used the AHAM 8-lb test load instead of the DOE 7-lb test load. For a test reducing the nominal RMC of the test load from an initial 70 percent to a final 5 percent, an 8-lb test load would require 5.2 lb of

[24] The clothes dryer would also consume energy to spin the drum during the cool-down period that is currently not accounted for by the DOE test procedure.

[25] A summary of this testing is available in the preliminary technical support document for the residential clothes dryer energy conservation standards rulemaking and can be found online at *http://www1.eere.energy.gov/buildings/appliance_standards/residential/clothes_dryers.html.*

[26] The AHAM 8-lb test load is made up of the following mixed cotton items, which are intended to represent clothes items regularly laundered: 2 sheets, 1 table cloth, 2 shirts, 3 bath towels, 2 "T" shirts, 2 pillow cases, 3 shorts, 1 wash cloth, 2 handkerchiefs.

water to be removed during the test cycle, whereas a 7-lb test load would only require 4.6 lb of water to be removed. Because the automatic cycle termination tests with the AHAM 8-lb test load would consume more energy to dry the greater amount of water in the test load, DOE developed a correction factor by comparing the rates of energy consumption per nominal percent RMC reduced between the automatic cycle termination test, and the tests conducted according to the current DOE test procedure.

Figure 0.1 shows the over-drying energy consumption versus the final RMC for a number of different units tested, and, in some cases, different cycle settings. DOE noted that some of the tested units stopped the test cycle at or higher than 5-percent RMC, thereby not producing over-drying. For the remaining tests, the data show that over-drying the test load to lower final RMCs requires higher energy consumption, with a slightly exponential trend likely because it becomes more difficult to remove the final small amounts of moisture remaining in the test load. DOE did not observe any apparent relationship between the type of automatic cycle termination sensor technology used and the amount of over-drying. However, these tests were conducted using different testing methods than the methods proposed in today's SNOPR (*e.g.,* various automatic cycle termination settings). Therefore, DOE was unable to determine whether one type of sensor technology is more accurate, and thus more effective at preventing over-drying.

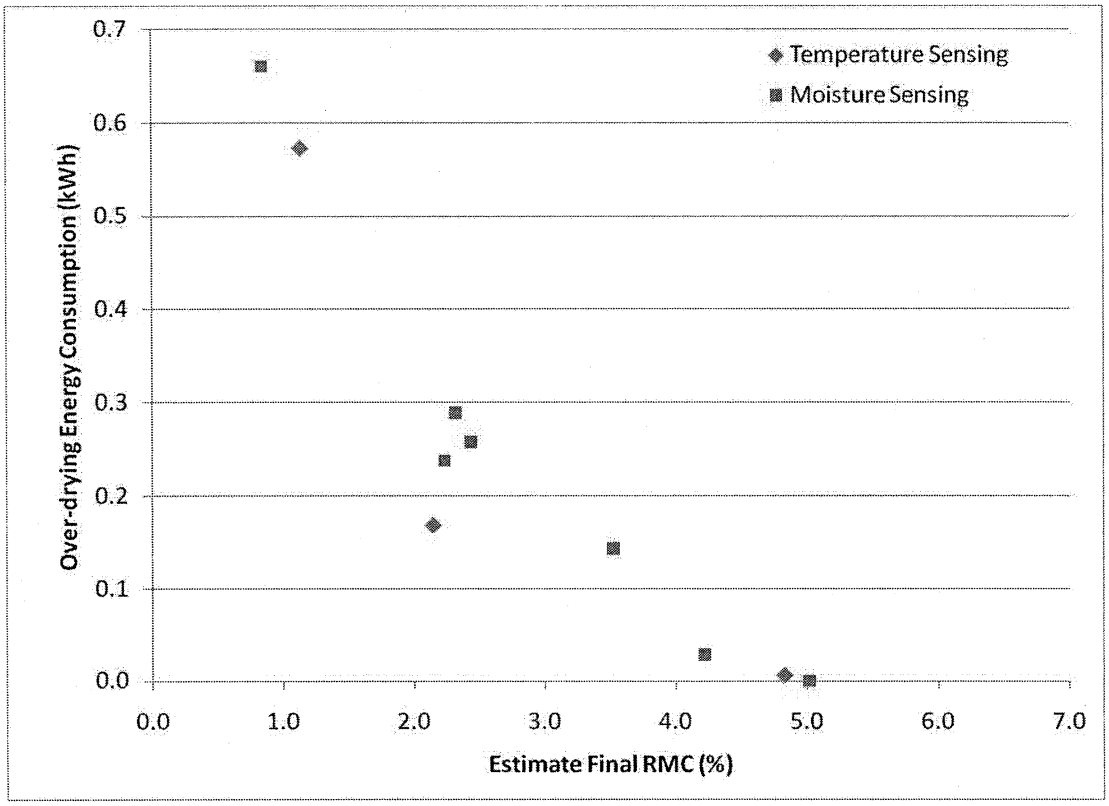

Figure 0.1 Automatic Cycle Termination Test Over-Drying Energy Consumption versus Estimated Final RMC

Figure 0.2 presents the data from one of the test runs for a vented baseline electric standard dryer, showing the cumulative energy consumption as the test load is dried. DOE observed that for this clothes dryer, the energy consumption versus the estimated RMC in the range of 70 percent to 10 percent shows a linear relationship. However, there appears to be an exponential trend when comparing the RMC below 5 percent to the over-drying energy consumption, with a significant increase in over-drying energy consumption when the RMC of the test load reaches approximately 3 percent or less. DOE observed these same trends in most of the other clothes dryers tested. As discussed above, this non-linearity at low RMC likely occurs because it becomes more difficult to remove the lesser amounts of moisture remaining in the test load.

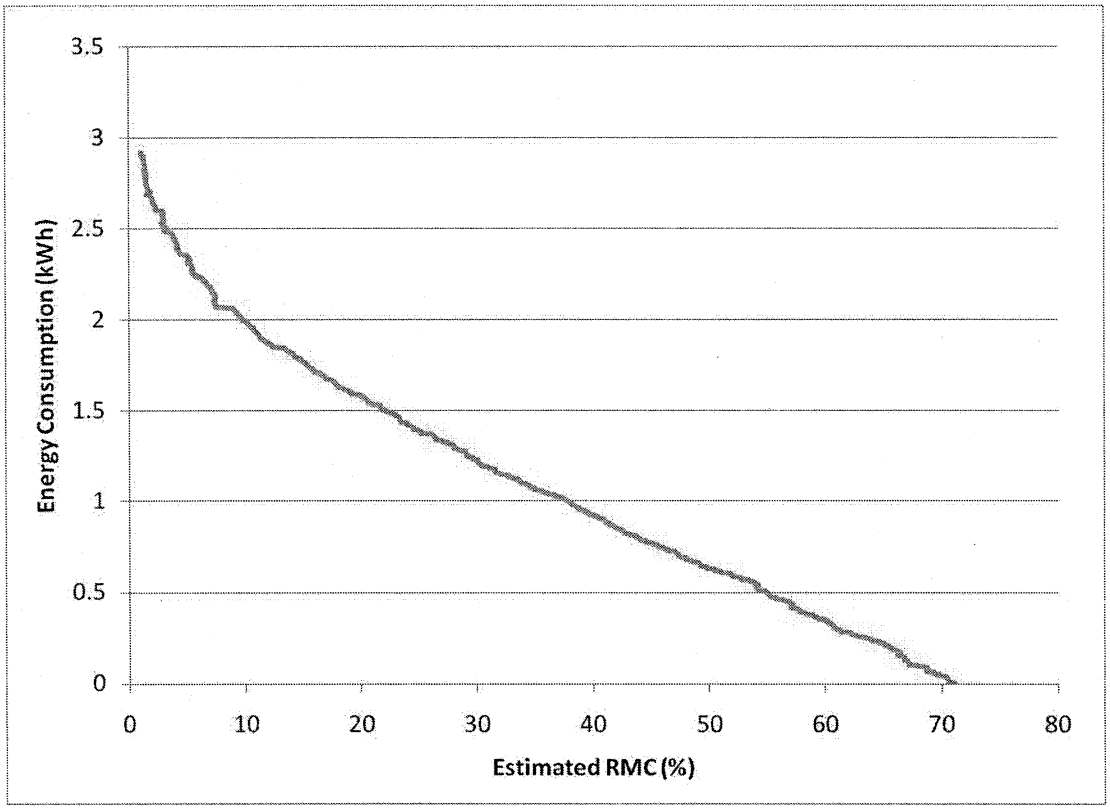

Figure 0.2 Automatic Cycle Termination Test Energy Consumption versus Estimated RMC during the Test Cycle

Because DOE had not yet developed the proposed test procedure for automatic cycle termination at the time that this testing was conducted, test conditions different than those proposed in the test procedure amendments were used; *i.e.,* various automatic cycle termination settings were applied to achieve the low RMCs, and an 8-lb AHAM test load comprising different materials and articles of clothing was used. Therefore, the testing results may not be representative of the results obtained when using the proposed automatic cycle termination testing methods.

DOE also analyzed how the proposed changes to the DOE clothes dryer test procedure, discussed above, would affect the measured EF of residential clothes dryers, as required by EPCA. EPCA also requires that DOE must determine how the EF of clothes dryers which are minimally compliant would be affected by the amendments to the test procedure, and based on this, amend the energy conservation standards as appropriate. (42 U.S.C. 6293(e)) As part of DOE's preliminary analyses for the energy conservation standards rulemaking for clothes dryers, DOE concluded that all clothes dryers currently available on the U.S. market that are covered under the current energy conservation standards are equipped with some form of automatic cycle termination sensing. Therefore, DOE analyzed, as discussed in the paragraphs below, how the proposed changes to the clothes dryer test procedure would affect the measured EF of residential clothes dryers according to the test procedure for automatic termination control dryers.

Because DOE is changing the FU credit from 1.04 to 1.0 for automatic termination control dryers, a dryer which has an automatic cycle termination setting that is capable of drying the test load to very close to 5-percent RMC, and therefore had little over-drying energy consumption, would receive a 4-percent credit in EF compared to the current DOE test procedure. DOE also notes that because the proposed test procedure requires the test load to be dried to a target final RMC of 5 percent (or lower), the measured energy consumption would decrease and EF increase if the target RMC of 5 percent is achieved (no over-drying), as compared to the current DOE test procedure which uses a correction factor in order to determine the energy consumption required to dry the test load to a final RMC of 4 percent. As discussed below for timer dryers, based on the differences in the calculations of per-cycle energy consumption using a starting RMC of 47 percent, if the target final RMC of 5 percent is achieved, DOE believes that the EF would increase by about 2.4 percent using the proposed test procedure as compared to the current DOE test procedure.

DOE believes that a clothes dryer which is minimally compliant with current energy conservation standards would likely use a less accurate automatic termination control system, and that such a dryer would possibly over-dry the test load below 5-percent RMC, such that the energy consumption and measured EF would be equivalent to that measured by the existing DOE clothes dryer test procedure. For this reason, DOE does not believe that any changes to the current energy conservation standards as a result of the proposed amendments to the test procedure to account for automatic cycle termination would be warranted. However, DOE welcomes comment on this tentative conclusion, as well as test data of minimally compliant clothes dryers tested according to the proposed automatic termination control dryer test procedure to determine whether changes to the current energy

conservation standards for dryers would be warranted.

The proposed test procedure for timer dryers would provide the energy consumption required to dry the test load from 47-percent RMC to 5-percent RMC. DOE notes that the 5-percent final RMC falls within the range of RMC specified by the current test procedure (2.5–5 percent final RMC). However, in the current DOE clothes dryer test procedure, the per-cycle energy consumption calculation contains a correction factor which is intended to normalize the measured energy consumption to represent the energy consumption required to dry the test load to 4-percent RMC.[27] Because the proposed test procedure for timer dryers would measure the energy consumption to reach a final RMC of only 5 percent, the energy consumption would be lower, and EF higher, as compared to the current DOE test procedure, which measures the energy consumption to reach a final RMC of 4 percent. Based on the differences in the calculations of per-cycle energy consumption, DOE believes that the EF would increase by about 2.4 percent using the proposed test procedure as compared to the current DOE test procedure, assuming that an initial RMC of 47 percent would be used in both cases. However, because DOE is unaware of any clothes dryers controlled only by a timer currently on the U.S. market, as noted above, DOE does not intend to revise the current energy conservation standards based on the proposed amendments to the test procedure.

3. Test Procedure for Vent-Less Clothes Dryers

DOE noted in the October 2007 Framework Document that a potential limitation of the clothes dryer test procedure had been identified for vent-less dryers, which includes condensing clothes dryers and combination washer/dryers. (Framework Document, STD No. 1 at p. 5) Manufacturers of vent-less clothes dryers commented that the current clothes dryer test procedure is unable to test this type of clothes dryer. Vent-less clothes dryers do not vent exhaust air to the outside as a conventional dryer does. Instead, they typically use ambient air in a heat exchanger to cool the hot, humid air inside the appliance, thereby condensing out the moisture. Alternatively, cold water can be used in the heat exchanger to condense the moisture from the air in the drum.[28] In either case, the dry air exiting the drum is reheated and recirculated in a closed loop. Thus, there is no moisture-laden exhaust air to vent outside, only a wastewater stream that either can be collected in an included water container or discharged down the household drain. However, the process of condensing out the moisture in the recirculated air results in higher energy consumption than a conventional dryer, and it can significantly increase the ambient room temperature.

Manufacturers of condensing clothes dryers have, in the past, applied for waivers from the DOE test procedure for these products on the basis that the test procedure did not contain provisions for vent-less clothes dryers. On November 15, 2005, LG filed an Application for Interim Waiver and Petition for Waiver from the clothes dryer test procedure for its condensing dryer model because it asserted that the current clothes dryer test procedure applies only to vented clothes dryers. The current test procedure requires the use of an exhaust restrictor to simulate the backpressure effects of a vent tube in an installed condition. Condenser dryers do not have exhaust vents as they recirculate rather than exhaust the process air. LG further stated that DOE's test procedure for clothes dryers provides no definition or mention of condensing clothes dryers. LG also noted that it knew of no other test procedure that would rate its condensing dryer products.

On August 23, 2006, DOE published the LG Petition for Waiver. 71 FR 49437. In that notice, DOE presented an alternate test procedure for vent-less dryers to address the potential limitation of the clothes dryer test procedure. 71 FR 49437, 49439.[29] The alternate test procedure consisted of adding separate definitions for a "conventional clothes dryer" (which is vented) and a "condensing clothes dryer" (which is a vent-less design). Further, the alternate test procedure presented in the LG Petition for Waiver qualified the requirement for an exhaust simulator so that it would only apply to conventional clothes dryers. In that notice, DOE stated that it is seeking comment on the proposed modification to the test procedure. In response, Whirlpool submitted a comment agreeing with the alternate test procedure, although it recommended clarifications to DOE's proposed definitions. 73 FR 66641, 66642 (Nov. 10, 2008). On November 10, 2008, DOE approved the LG Petition for Waiver and determined that LG should not be required to rate or test the subject clothes dryer model according to the existing test procedure. The notice did not include further rulemaking actions on the presented alternate test procedure. 73 FR 66641.

Under DOE's regulations for petitions for waiver from the energy conservation program, codified in 10 CFR 430.27(m), DOE is required to publish a NOPR within 1 year of the granting of any waiver. The NOPR would propose amending its regulations to eliminate any need for continuation of the waiver. DOE is required to subsequently publish a final rule as soon thereafter as practicable. The waiver would then terminate on the effective date of the final rule. Publication of this SNOPR addressing, in part, test procedures for vent-less clothes dryers, would satisfy these regulatory requirements for the LG waiver.

DOE notes that there are currently no existing Federal energy conservation standards for vent-less clothes dryers. In the October 2007 Framework Document, DOE stated that it intended to analyze potential energy conservation standards for vent-less clothes dryers. In particular, DOE proposed to analyze vent-less clothes dryers as a separate product class, recognizing the unique utility that vent-less clothes dryers offers to consumers (the ability to be installed in conditions in which vented clothes dryers would be precluded due to venting restrictions). DOE proposed to analyze two product classes for vent-less clothes dryers: (1) Vent-less electric compact (240V) clothes dryers, and (2) electric combination washer/dryers. DOE also requested comment in the October 2007 Framework Document on the alternate test procedure for vent-less clothes dryers proposed in the LG Petition for Waiver.

ALS and CEE both commented in response to the October 2007 Framework Document in support of revising the clothes dryer test procedure to test vent-less clothes dryers. (ALS, STD No. 6 at p. 1; CEE, STD No. 10 at pp. 1–2) AHAM also supported including a provision to test vent-less clothes dryers, but added that a single procedure for vented and vent-less clothes dryers may not be applicable. (AHAM, STD No. 8 at p. 1) At the October 2007 public meeting, AHAM commented that adding ventless dryers

[27] The correction factor in the current test procedure normalizes the measured energy consumption to represent the energy consumption required to dry the test load from 70-percent initial RMC to 4-percent final RMC. As discussed in section III.C.5.b, DOE is proposing to change the initial RMC from 70 to 47 percent. DOE has considered the effects of changing the initial RMC from 70 to 47 percent on the measured EF in section III.C.5.b.

[28] This is a typical approach for combination washer/dryers, which wash and dry a load in the same drum.

[29] DOE's alternate test procedure for vent-less dryers was described in the LG Petition for Waiver.

to the test procedure is not as simple as closing a vent off, but may require a more significant change to appropriately measure energy use. AHAM added that it would work on developing such a test procedure for DOE to measure energy use. (AHAM, Public Meeting Transcript, STD No. 4.6 at pp. 18–19) AHAM commented that the energy calculation for vent-less clothes dryers should take a more "holistic" approach than those for vented clothes dryers because vent-less clothes dryers can have an effect on energy use outside of their system (*i.e.,* impacts on HVAC loads). (AHAM, Public Meeting Transcript, STD No. 4.6 at p. 51; AHAM, STD No. 8 at p. 3) Whirlpool commented that in light of increasing interest by manufacturers in offering vent-less clothes dryers in North America, it would work through AHAM to propose an appropriate test procedure. (Whirlpool, STD No. 7 at p. 2) Whirlpool also noted that combination washer/dryers would require a unique test procedure, and that DOE should weigh the effort to create such a test procedure against the potential for energy savings from a product with very modest annual unit sales. (Whirlpool, STD No. 7 at p. 3)

DOE notes that accounting for ambient space conditioning impacts would require significant changes to the current test procedure. According to EPCA, any test procedures prescribed or amended under this section shall be reasonably designed to produce test results which measure energy efficiency, energy use, water use, or estimated annual operating cost of a covered product during a representative average use cycle or period of use. (42 U.S.C. 6293(b)(3)) DOE believes that accounting for impacts on HVAC loads on energy use of a household would be beyond the scope of a test procedure to measure the energy use of a product, as prescribed by EPCA. DOE also notes that other DOE test procedures for products such as refrigerators, ovens, and water heaters which could impact HVAC loads, do not take into account these impacts on ambient space conditioning in the test procedure. DOE also notes that for the energy conservation standards rulemaking for water heaters, DOE considered the effects of heat pump water heaters on house heating loads as part of the energy-use characterization, and did not propose to amend the test procedure to account for such energy use. For these reasons, DOE is not proposing to amend the DOE clothes dryer test procedure to account for the ambient space conditioning impacts, but will consider such impacts as part of the concurrent energy conservation standards rulemaking.

In order to analyze potential energy conservation standards for vent-less clothes dryers, provisions must be added to the DOE clothes dryer test procedure for measuring the energy efficiency performance in vent-less clothes dryers. Therefore, DOE determined to consider such amendments to its clothes dryer test procedure. DOE first examined the test procedure proposed as part of the LG Petition for Waiver. DOE conducted limited tests of vent-less clothes dryers at an independent testing laboratory according to those amendments. DOE tested one vent-less electric compact (240V) clothes dryer and one vent-less combination washer/dryer, conducting three test runs per unit. Table 0.6 shows the results from DOE's tests. DOE observed no variation in EF from test to test within the precision of the proposed test procedure for the vent-less electric compact (240V) dryer, and less than 2-percent variation in EF from test to test for the vent-less combination washer/dryer. Based on this limited testing, the proposed testing procedures appear to produce repeatable results. DOE welcomes additional test data for vent-less clothes dryers tested according to the alternate test procedure presented in the LG Petition for Waiver, in particular to analyze the test-to-test variation for individual units tested multiple times.

TABLE 0.6—DATA FROM DOE TESTING OF VENT-LESS CLOTHES DRYERS

Test run	Energy factor *(lb/kWh)*	
	Vent-less electric compact (240 V)	Vent-less combination washer/dryer
1	2.37	1.95
2	2.37	1.96
3	2.37	1.93

In reviewing alternate test procedures for vent-less clothes dryers for potential amendments to the DOE test procedure, DOE also investigated testing conditions and methods specified in test standards used internationally. DOE is aware of international test standards for clothes dryers used in Europe, China, Australia, and New Zealand which include provisions for vent-less or condensing clothes dryers.

DOE evaluated EN Standard 61121, and identified as relevant the test procedures for condensing (vent-less) clothes dryers, as well as certain test conditions which affect all clothes dryers. These test procedures provide greater specificity than the alternate test procedure presented in the LG Petition for Waiver, and details of the relevant sections of EN Standard 61121 are presented below.

Section 3 of EN Standard 61121, "Definitions and symbols," provides definitions for various types of dryers, including:

"*3.1*
tumble dryer
appliance in which textile material is dried by tumbling in a rotating drum, in which heated air is passed"

"*3.2*
air vented tumble dryer
tumble dryer with a fresh-air intake which is heated and passed over the textile material and where the resulting moist air is exhausted into the room or vented outside,"

"*3.3*
condenser tumble dryer
tumble dryer in which the air used for the drying process is dehumidified by cooling."

Section 6.1 of EN Standard 61121, "General," which addresses general conditions for measurements, provides in part the following conditions for dryer installation and, in particular, installation without an exhaust duct:

"The measurements shall be carried out on a tumble dryer installed and used in accordance with manufacturer's instructions, except as required by this standard."

* * * * *

"Where the tumble dryer is intended for use without a duct (i.e., the tumble dryer is intended to be vented into the room), the tumble dryer shall be tested as supplied without a duct."

* * * * *

"Where a manufacturer gives the option to use the tumble dryer both with and without a duct, the tumble dryer shall be tested without a duct."

Section 6.2.3 of EN Standard 61121, "Ambient temperature," requires that the ambient temperature of the room in the vicinity of the dryer shall be maintained at 23 ± 2 degrees Celsius (°C) throughout the test.

Section 9 of EN Standard 61121, "Performance tests," provides the test procedures for performance tests of the main tumble dryer functions. In particular, section 9.1, "General," states:

* * * * *

"Tumble dryers shall be configured with or without a duct as specified in 6.1."

"All tests shall be started with the tumble dryer at ambient temperature conditions according to 6.2.3."

Note: This can be done by leaving the machine at ambient conditions for at least 12 h [hours].

Section 9.2.1 of EN Standard 61121, "Drying tests general," which details the procedures for the drying test, provides in part the following:

"For automatic tumble dryers those programmes are selected which aim to achieve the final moisture values given in table 3."[30]

* * * * *

"The minimum number of valid cycles shall be five * * * If the dryer is automatically stopped during a cycle and the reason is that the condensation box is full of water, the fact is reported and the test is stopped."

"**Note:** If the manufacturer gives the option to use a condenser tumble dryer both with or without condensation box, the dryer should be tested with the condensation box."

Section 9.2.1 also provides that water and energy consumption for the cycle shall be reported. The water consumption would be applicable to condensing clothes dryers which use water to condense moisture in the drum exhaust air.

Section 10.3 of EN Standard 61121, "Water consumption," provides for the calculation of the corrected test cycle water consumption corresponding to the nominal final RMC (specified in Table 3 of EN Standard 61121).

EN Standard 61121 also provides a method for measuring the efficiency of condensing moisture from the test load. Section 9.2.2 of EN Standard 61121, "Condensation efficiency," states the following:

"The condensation efficiency for a condenser tumble dryer, shall be measured using the dry cotton programme and setting selected to achieve the "dry cotton" result (this means the equivalent timer setting for a timer dryer) in the drying test."

"The mass of the test load is measured immediately before and after the cycle. The mass of the moisture condensed during the cycle and collected in the container is determined. The first cycle after a period of non-operation longer than 36 h shall not be used for evaluation."

"During the time between two cycles the door of the tumble dryer shall be closed except for loading."

Section 10.5 of EN Standard 61121, "Condensation efficiency," subsequently provides the following methods and calculations for the condensation efficiency:

"Efficiency of condensation, C, is determined according to 9.2.2 as the ratio between the water produced during the cycle W_w, relative to the total mass of water evaporated from the load."

* * * * *

"Efficiency of condensation is the mean value of a minimum of four valid cycles."

"**Note:** Due [to] this requirement the first run of a condensation efficiency test has normally to be discarded."

DOE notes that AS/NZS Standard 2442.1 also includes provisions for condensing clothes dryers. AS/NZS Standard 2442.1 states that the scope of the standard specifically includes condenser dryers and the dryer function of combination washer/dryers. Section 1.4.4 of AS/NZS Standard 2442.1, "Dryer types," provides the following definitions for vented and condenser clothes dryers:

"*Vented electric rotary clothes dryer*—a clothes dryer in which air (usually heated) is passed through the load while it is being tumbled. The air and accumulated moisture is then discharged to the atmosphere."

"*Condenser electric rotary clothes dryer*—a clothes dryer in which air (usually heated) is passed through the load while it is being tumbled. The moisture thus accumulated is then separated from the air within the dryer, converted to a liquid, and either drained or stored for later removal."

DOE notes that these definitions are essentially the same as those provided in EN Standard 61121. Both definitions state that the moisture in the air from the drying process is dehumidified, but AS/NZS Standard 2442.1 adds more detail providing that the liquid can either be drained or stored for later removal. Section 3.4 of AS/NZS Standard 2442.1, "Exhaust," also provides the following exhaust conditions for installation, which DOE notes are very similar to those provided in EN Standard 61121, and provides conditions to cover all possible dryer configurations:

"3.4.3 Dryers with optional exhaust duct—Where a dryer is designed to operate with an optional exhaust duct, the dryer shall be tested without the duct fitted, in accordance with the manufacturer's instructions for operating without a duct."

"3.4.4 Dryers without exhaust duct—Where a dryer is designed solely to operate without an exhaust duct, the test shall be carried out in accordance with the recommendations of the manufacturer."

Similar to EN Standard 61121, AS/NZS Standard 2442.1 provides that for condensing clothes dryers, as applicable, the volume of supply water consumed be recorded at the end of the test cycle. The test procedure also provides a calculation of the water consumption per test cycle (used to reach the specified final RMC).

DOE also considered comments that Whirlpool submitted as part of the residential clothes dryer and room air conditioner energy conservation standards rulemaking, providing amendments to the DOE test procedure for clothes dryers to include methods for the testing of condensing dryers.[31] These suggested amendments were largely based upon EN Standard 61121. Whirlpool stated that section 1 of the DOE test procedure for clothes dryers must incorporate definitions of an "exhausted dryer," "non-exhausted dryer," and a "condensing dryer." Whirlpool suggested the following definitions:

"An exhausted Dryer has a blower system which is intended to deliver the heated, moist air from the Drum cavity into a duct system external to the Dryer and this duct system is exhausted into the outdoors."

"A non-exhausted Dryer is intended to be used without an external duct system and has no provision to connect to such a duct system."

"A condensing Dryer is a non-exhausted tumble Dryer in which the air used for the drying process is dehumidified by using room ambient air for cooling. The blower system used for circulating room ambient air is independent of the heated moist air from the Drum cavity."

(Whirlpool, STD No. 13 at p. 20).

Whirlpool also stated that section 2.1 of the DOE test procedure for clothes dryers must be updated to include non-exhausted dryers. Whirlpool proposed that "[w]here the tumble Dryer is defined as a non-exhausted Dryer and is intended for use without a duct [t]he tumble Dryer shall be tested as supplied without a duct," and that "[w]here the tumble Dryer is defined as an exhausted Dryer and is intended for use with a duct [t]he Dryer exhaust shall be

[30] Table 3 of EN Standard 61121 specifies the final moisture content of the test load after drying for "dry cotton" programme as 0 percent with an allowable range of −3 to +3 percent.

[31] Whirlpool, 2007. "U.S Department of Energy Test Procedure Change for Condensing Clothes Dryers." September 4, 2007. Docket No. EE–2007–BT–STD–0010, Comment Number 13.

restricted by adding the AHAM exhaust simulator described in 3.3.5 of [AHAM Standard HLD–1–2009].'' *Id.*

With regard to the pre-conditioning cycle in section 2.8 of the DOE test procedure for clothes dryers, Whirlpool proposed that, in order to align with the European energy procedure, the DOE test procedure should incorporate the following condensing dryer pre-conditioning cycle: ''For condensing Dryers, the Dryer steady state temperature must be equal to ambient room temperature according to 2.2 before the start of all test runs. Note: this can be done by leaving the machine at ambient room conditions for at least (12) hours between tests but not more than (36) hours between tests.'' *Id.* at 21. In addition, Whirlpool stated that in order to align with the European energy procedure and for consistency in results, the DOE test procedure should incorporate the following condenser dryer test procedure steps:

''If the manufacturer gives the option to use a condensing tumble Dryer both with or without condensation box, the Dryer shall be tested with the condensation box.''

''If the Dryer is automatically stopped during a cycle and the reason is that the condensation box is full of water, the test is stopped, and the run is invalid.''

''During the time between two cycles, the door of the tumble Dryer shall be closed except for loading.''

''The first cycle after a period of non-operation longer than (36) hours shall not be used for evaluation.''

''Results from the first test run on an unused (dry) condensing Dryer are invalid and cannot be used for the energy efficiency calculations.''

''The Condenser unit of the Dryer must remain in place and not be taken out of the Dryer for any reason between tests.''

Id. at 22.

After review of the definitions detailed in EN Standard 61121 (section 3), AS/NZS Standard 2442.1 (section 1.4), and Whirlpool's proposed amendments to the DOE test procedure, DOE concludes that the definitions of ''conventional clothes dryer'' and ''condensing clothes dryer'' proposed in the LG Petition for Waiver are essentially the same as the definitions discussed above from the international test standards. Therefore, DOE proposes to define ''conventional clothes dryer'' as ''a clothes dryer that exhausts the evaporated moisture from the cabinet,'' and ''vent-less clothes dryer'' as ''a clothes dryer that uses a closed-loop system with an internal condenser to remove the evaporated moisture from the heated air. The moist air is not discharged from the cabinet.'' DOE is proposing to use the term ''vent-less'' to reflect the actual consumer utility (*i.e.* no external vent required) instead of ''condensing'' because of the possibilty of market availability of vented dryers that also condense. DOE invites comment on these proposed definitions.

After evaluating the installation conditions detailed in EN Standard 61121 (section 6.1), AS/NZS Standard 2442.1 (section 3.4), and Whirlpool's proposed amendments to the DOE test procedure, DOE believes that the proposed amendments regarding the exhaust duct installation requirements in DOE's publication of the LG Petition for Waiver are appropriate for testing vent-less dryers, along with additional clarifications. DOE notes that the exhaust duct installation conditions proposed in the LG Petition for Waiver simply remove the requirement of installing an exhaust simulator for a clothes dryer without an exhaust duct (vent-less dryer). The international test standards, detailed above, similarly require that a clothes dryer without an exhaust duct be tested as such, but also provide additional conditions for a clothes dryer with an optional exhaust duct, stating that such a dryer should be tested without the duct installed. DOE believes these installation conditions provide additional clarity and cover all possible clothes dryer configurations as well as provide harmonization with international test standards. Therefore, DOE proposes in today's notice to amend section 2.1 of the DOE test procedure for clothes dryers, which covers installation conditions, to qualify the requirement for an exhaust simulator so that it would only apply to conventional clothes dryers, with additional clarification that vent-less clothes dryers be tested without the exhaust simulator installed and, if a dryer is designed to operate with an optional exhaust duct, the dryer shall be tested without the duct installed.

DOE also believes that the provisions in EN Standard 61121 regarding a condensation box provides additional clarity in an effort to cover all possible vent-less dryer configurations. For this reason, DOE is proposing to revise section 2.1, ''Installation,'' of the DOE test procedure for clothes dryers to add the requirement in the installation conditions that ''if a manufacturer gives the option to use a vent-less dryer with or without a condensation box, the dryer shall be tested with the condensation box installed.'' In addition, DOE proposes to amend the testing cycle measurement in section 3.3 of the DOE test procedure for clothes dryers to add that ''if the dryer automatically stops during a cycle and the reason is that the condensation box is full of water, the test is stopped, and the test run is invalid.'' This requirement would ensure consistency of the measured efficiency.

Also regarding installation conditions, DOE believes that Whirlpool's proposal to add a requirement that the condenser unit of the dryer must remain in place and not be taken out of the dryer for any reason between tests would provide additional clarification to the test procedure and ensure that all manufacturers are testing products under the same conditions. For this reason, DOE proposes in today's SNOPR to add in section 2.1 of the DOE clothes dryer test procedure regarding installation the provision that ''the condenser unit of the dryer must remain in place and not be taken out of the dryer for any reason between tests.'' DOE invites comment on the proposed amendments regarding installation conditions, including exhaust configuration, condensation box, and condenser unit requirements.

DOE believes that the methodology in the current DOE test procedure for conventional (vented) dryers can be applied to vent-less dryers, with a number of added clarifications. Based upon starting test conditions detailed in EN Standard 61121 (section 9.1) and Whirlpool's proposed amendments, DOE agrees that section 2.8 of 10 CFR 430 subpart B appendix D will likely need to be revised to provide a consistent and repeatable approach for vent-less clothes dryers. Currently, this section, which addresses clothes dryer preconditioning, requires that before any test cycle is initiated, the clothes dryer must be operated without a test load in the non-heat mode for 15 minutes or until the discharge air temperature varies less than 1 °F during a period of 10 minutes, whichever is longer. Because a vent-less clothes dryer does not have discharge air for which the temperature can be measured, DOE proposes to revise this section to require that, for vent-less clothes dryers, the steady-state temperature must be equal to ambient room temperature according to section 2.2 of appendix D before the start of all test runs, with a note that this can be done by leaving the machine at ambient room conditions for at least 12 hours but not more than 36 hours between tests. DOE also proposes to revise section 2.8, ''Test loads,'' of the DOE clothes dryer test procedure to add a qualification to the procedure for pre-conditioning that it applies only to vented clothes dryers.

DOE agrees with the provisions in section 9.2.2 of EN Standard 61121 and Whirlpool's proposed amendments that specify that the first cycle after a period of non-operation longer than 36 hours

shall not be used for evaluation, and that, between test cycles, the door of the tumble dryer shall be closed except for loading (and unloading). DOE notes that this would make the first test run on an unused (dry) condensing dryer invalid and could not be used for the energy efficiency calculations. DOE believes these provisions will maintain a clear and repeatable testing procedure and produce accurate and representative results. Therefore, DOE proposes in today's notice to incorporate these provisions into section 3.3 of the DOE clothes dryer test procedure. DOE welcomes comment on these provisions as well as data comparing test results allowing longer or shorter than 36 hours of non-operation to evaluate the repeatability of test results.

DOE notes that section 9.2.1 of EN Standard 61121 requires that at least five valid test cycles be performed and the results averaged. DOE's clothes dryer test procedure does not specify multiple test cycles to obtain the representative EF, and DOE is not aware of data suggesting that test-to-test variation is sufficient to warrant a requirement for more than one test cycle. Therefore, DOE is not proposing amendments addressing the number of valid test cycles. DOE welcomes input and data on this issue.

DOE also investigated the water consumption of vent-less clothes dryers. Based upon its review of products on the U.S. market, DOE is unaware of any vent-less electric compact (240V) condensing dryers which use water in a heat exchanger to condense moisture in the air exiting the drum; instead, available units use an air-to-air heat exchanger. DOE's review also showed that only vent-less combination washer/dryers use water to condense moisture in the air exiting the drum for products on the market in the United States. As part of its energy testing of clothes dryers conducted at an independent laboratory, DOE measured the water consumed by a vent-less combination washer/dryer according to the DOE clothes dryer test procedure (without the use of the exhaust simulator). The test procedure was conducted three times, and the combination washer/dryer consumed on average 3.25 gallons (27.1 lb) of cold water, with a range of 2.83 gallons to 3.95 gallons. Although this water consumption is not insignificant, combination washer/dryers represent a very small niche of the U.S. clothes dryer market and, therefore, DOE believes that the benefit of measuring water use for vent-less dryers is outweighed by the burden that would be placed on manufacturers to measure water consumption. For this reason, DOE is not proposing amend the DOE test procedure to include a requirement to measure the water consumption for vent-less condensing clothes dryers. DOE welcomes comment and data on the water consumption of vent-less clothes dryers and whether measurement of water consumption should be included in the DOE clothes dryer test procedure.

DOE believes the results from DOE's tests at an independent laboratory are representative of the repeatability of results that would be observed using the testing procedures proposed in today's SNOPR. Although DOE's tests were conducted using the alternate test procedure in the LG Petition for Waiver, DOE believes that the additional clarifications proposed in today's SNOPR would not significantly affect these testing results. Therefore, DOE believes that the amendments to the test procedure to for vent-less clothes dryers proposed in today's notice would produce accurate and repeatable measurements of CEF.

The proposed amendments for vent-less clothes dryers would cover products which are not covered under the current DOE test procedure. For this reason, the proposed amendments in today's SNOPR for vent-less clothes dryers would not affect the existing EF ratings of residential clothes dryers. Therefore, no change to the current clothes dryer energy conservation standards would be required. (42 U.S.C. 6293(e))

4. Detergent Specifications for Clothes Dryer Test Procedure Preconditioning

Section 2.6.3 of the current DOE clothes dryer test procedure specifies that the test cloth be preconditioned by performing a 10-minute wash cycle in a standard clothes washer using AHAM Standard Test Detergent IIA. 10 CFR part 430, subpart B, appendix D, section 2.6.3. This detergent is obsolete and no longer supplied by AHAM or other suppliers. The current AHAM standard detergent is identified as AHAM standard test detergent Formula 3. Because AHAM Standard detergent IIA is no longer available to manufacturers, DOE proposes to amend section 2.6.3 of the clothes dryer test procedure to specify the use of AHAM standard test detergent Formula 3 in test cloth preconditioning.

Clothes washer tests that DOE conducted with AHAM standard test detergent Formula 3 suggest that the dosage that is specified in section 2.6.3(2) of the DOE clothes dryer test procedure for AHAM Standard detergent IIA—6.0 grams (g) per gallon of water—may no longer be appropriate, because at the end of clothes washer test cloth preconditioning, which specifies the same dosage, undissolved clumps of detergent were observed in the cloth load. Further, DOE conducted extractor tests that indicate that detergent dosage impacts RMC measurements by as much as several percent.

AHAM's clothes dryer test standard, AHAM HLD–1–2009, specifies a standard test detergent Formula 3 dosage of 27 g + 4.0 g/lb of base test load for test cloth pre-treatment. For DOE's clothes dryer test cloth preconditioning, the current test procedure specifies that clothes washer water fill level be set to the maximum level, regardless of test load size. In today's notice, DOE is proposing to amend the test load size for standard-size clothes dryers to 8.45 lb ±.085 lb (see section III.C.5.c.), which would result in a detergent dosage for AHAM standard test detergent Formula 3 of 60.8 g. DOE believes that the detergent concentration should be set by the pounds of test cloth in this standard-size test load because this load is more closely matched to the maximum water fill level than is the compact-size test load (3.0 lb ±.03 lb.) For preconditioning a compact-size test load, DOE proposes that the same detergent dosage would be specified because the water fill level would remain the same as for the larger load, resulting in the same concentration of the water/detergent mixture. 10 CFR part 430, subpart B, appendix D, revised section 2.6.3.

Due to the observed problems associated with the current dosage specification in the DOE clothes dryer test procedure, DOE is tentatively proposing in today's notice to amend section 2.6.3 of the clothes dryer test procedure to require 60.8 g of AHAM standard test detergent Formula 3 for test cloth preconditioning, but is also seeking further information on the appropriate detergent concentration.

DOE is unaware of any data indicating that changes to the detergent specifications for test cloth preconditioning would affect the measured efficiency. DOE believes that the proposed amendments in today's SNOPR changing the detergent specifications for test cloth preconditioning would not affect the EF rating of residential clothes dryers and would not require revision of the existing energy conservation standards for these products. However, DOE welcomes data showing the effects of changing the detergent specifications for test cloth preconditioning on the measured EF for clothes dryers.

5. Changes To Reflect Current Usage Patterns and Capabilities

a. Clothes Dryer Number of Annual Cycles

As noted above, DOE established its test procedure for residential clothes dryers in a final rule published in the **Federal Register** on May 19, 1981. 46 FR 27324. Although DOE has updated its test procedure for residential clothes washers since that time,[32] it has not updated its residential clothes dryer test procedure since it was first established in 1981. In the revised residential clothes washer test procedure, the average number of annual use cycles was revised to reflect current (at the time) consumer use patterns. DOE noted in the October 2007 Framework Document that the average number of dryer use cycles assumed in the revised clothes washer test procedure is inconsistent with the use cycles in the clothes dryer test procedure. (Framework Document, STD No. 1 at p. 4)

In the case of the average residential clothes washer annual use cycles, DOE published a final rule on August 27, 1997, amending the DOE clothes washer test procedure to lower the annual clothes washer use cycles from 416 to 392 cycles per year, a value that DOE determined to be more representative of current usage patterns. 62 FR 45484. Further, the revised DOE clothes washer test procedure assumes that 84 percent of all clothes washer loads are dried in clothes dryers. Thus, based upon the parameters in the current residential clothes washer test procedure, the annual usage pattern for clothes dryers is calculated to be 329 cycles per year. In contrast, the current DOE residential clothes dryer test procedure assumes an average annual clothes dryer use of 416 cycles per year, which is 21 percent higher than the number of cycles per year derived from the current clothes washer test procedure. DOE notes that the number of annual cycles does not factor into the EF calculation except in the case of gas clothes dryers with standing pilots (which DOE determined are no longer available on the market), nor is the number of annual cycles used in the life-cycle cost (LCC), national energy savings (NES), or national impact analysis (NIA) calculations, which instead use consumer survey data. DOE sought comment on this issue in the October 2007 Framework Document. (Framework Document, STD No. 1 at p. 5)

In response to the October 2007 Framework Document, AHAM stated that it supports changing the clothes dryer test procedure to decrease the use cycles from 416 to 329 cycles per year, as proposed by DOE, based on usage patterns for residential washers. (AHAM, STD No. 8 at p.1) CEE also supported decreasing the number of use cycles to be more consistent with the clothes washer test procedure. CEE noted that in the amendments to the DOE test procedure for clothes washers in 1997, the clothes dryer utilization factor (*i.e.,* percentage of clothes washer loads dried in clothes dryers) was set to 84 percent. However, CEE was unsure whether 392 (the number of annual clothes washer cycles) or 329 (84 percent of 392) is the correct number of clothes dryer cycles, and recommended that DOE re-examine the clothes dryer utilization factor. (CEE, STD No. 10 at p. 1) EEI stated that the test procedure should have fewer use cycles based on the EIA's RECS data and demographic projections. (EEI, STD No. 5 at p. 2)

Whirlpool commented that 392 annual clothes washer cycles are generally accepted as valid. However, Whirlpool stated that the value of 84 percent of washer loads being machined dried is high. Whirlpool cited data from Procter & Gamble indicating that consumers average 5.72 loads per week, or 297 annually, and that line drying and blocking are a common alternative to machine drying. Whirlpool also stated that other surveys suggest that annual laundry loads are closer to 343 than 392, which, if the 84 percent were applied, would result in 288 dryer loads annually. However, Whirlpool concluded that the annual number of cycles should be 298 (equaling 76 percent of the 392 clothes washer loads). (Whirlpool, STD No. 7 at p. 2)

The Joint Comment stated that DOE should request manufacturers to verify that the ratio of dryer cycles to washer cycles is 84 percent. The Joint Comment commented that DOE should establish the number of clothes dryer cycles independent of washer cycles because some laundry is washed but not dried in a dryer, while some clothes dryer loads have not been washed. The Joint Comment also noted that many recently manufactured clothes dryers have software that logs the number of cycles, and manufacturers could provide cycle count data for clothes dryers with at least 1 full year of operation (to account for month-to-month variations). The Joint Comment stated that another potential data source DOE should check is the California Measurement Advisory Council (CALMAC), which documents appliance energy use in California. (Joint Comment, STD No. 9 at pp. 10–11)

For these reasons, DOE determined to review available data and investigate the number of annual clothes dryer use cycles in order to amend its test procedure to accurately reflect current consumer usage habits. DOE reviewed the 2004 California Statewide Residential Appliance Saturation Study (RASS), which surveyed appliance product usage patterns, including clothes dryers.[33] The study surveyed 7,686 households between 2002 and 2003, asking the question "how many loads of clothes do you dry in your clothes dryer during a typical week?" For the 6,790 of these households that said they owned a clothes dryer, average usage was 4.69 loads per week, or approximately 244 loads per year. However, because this study provides only a limited dataset, DOE does not intend to rely only on this data to determine an appropriate number of annual use cycles for the clothes dryer test procedure.

DOE also reviewed data from the 2005 RECS to determine the annual usage of clothes dryers. RECS is a national sample survey of housing units that collects statistical information on the consumption of and expenditures for energy in housing units along with data on energy-related characteristics of the housing units and occupants. RECS provides enough information to establish the type (*i.e.,* product class) of clothes dryer used in each household, the age of the product, and an estimate of the household's annual energy consumption attributable to clothes dryers. DOE estimated the number of clothes dryer cycles per year for each sample home using data given by RECS on the number of laundry loads (clothes washer cycles) washed per week and the frequency of clothes dryer use. Based on its analysis of RECS data, DOE estimated the dryer usage factor (the percentage of washer loads dried in a clothes dryer) to be 91 percent and the calculated average usage to be 283 cycles per year for all product classes of clothes dryers. DOE also notes that the RECS data shows a historical decreasing trend for the number of clothes washer and clothes dryer cycles. Because this dataset is more extensive than that of the RASS, DOE believes these numbers are more representative of annual usage patterns. Therefore, DOE is proposing to amend the number of annual use cycles in its test procedure to 283 cycles for all product classes of clothes dryers.

[32] *See* 62 FR 45484 (Aug. 27, 1997); 68 FR 62198 (Oct. 31, 2003).

[33] For more information visit: *http://www.energy.ca.gov/appliances/rass/.*

The proposed amendments for the number of annual use cycles only affect the equations for the per-cycle gas energy consumption of a continuously burning pilot light in gas dryers, which factors into EF, and the estimated annual operating cost for all clothes dryers. DOE is not aware of any gas dryers currently available on the market that incorporate a continuously burning pilot light. For this reason, DOE believes the proposed amendments in today's SNOPR to change the number of clothes dryer annual use cycles would not affect the EF rating of residential clothes dryers and would not require revision of the existing energy conservation standards for these products.

b. Clothes Dryer Initial Remaining Moisture Content

In the revised residential clothes washer test procedure, a new parameter, the RMC of the test cloth, was introduced. The RMC is the ratio of the weight of water contained by the test load at the completion of the clothes washer energy test cycle to the bone-dry weight of the test load, expressed as a percent. Correspondingly, the initial RMC of a clothes load being dried is a function of RMC at the end of a clothes washer cycle. The current DOE clothes dryer test procedure specifies an initial RMC of 70 ± 3.5 percent. As was explained above for the average number of use cycles per year, the RMC of typical clothes loads in the residential clothes washer test procedure should be consistent with values defined in the clothes dryer test procedure. However, DOE believes that the initial RMC in the clothes dryer test procedure may not reflect typical RMCs of actual clothes dryer loads.

DOE notes that the revision to the clothes washer test procedure changed the clothes washer energy conservation standards metric to a modified energy factor (MEF), which established a method for crediting the performance of clothes washers that lower the RMC and, thereby, reduce clothes drying energy use. Since the clothes dryer test procedure was established in 1981 (46 FR 27324, May 19, 1981), average clothes washer RMC has decreased due to the introduction of higher efficiency models with higher final spin speeds. Therefore, while clothes dryer energy use has decreased with the lower RMC, clothes washer energy use has increased somewhat to achieve the higher spin speeds. This energy use is accounted for in the residential clothes washer energy conservation standards rulemaking, and the net national annual energy use for clothes washers and clothes dryers combined is expected to decrease as average RMC is reduced. During the course of the standards rulemaking for clothes washers that culminated in a final rule published in the **Federal Register** on January 12, 2001, DOE estimated RMCs at specific efficiency levels. 66 FR 3314. For the residential clothes washer standard which became effective January 1, 2007 (1.26 MEF), DOE estimated a weighted-average RMC of 56 percent.

As discussed in section I, the EF for clothes dryers is determined by measuring the total energy required to dry a standard test load of laundry to a "bone dry" state. If today's clothes dryer loads have initial RMCs that are lower than the nominal 70 percent specified in the existing DOE clothes dryer test procedure, revisions to the test procedure to reflect more realistic (*i.e.,* lower) RMCs would result in the current EF rating increasing for a given clothes dryer, since the clothes dryer would have less water to remove.

AHAM commented in response to the October 2007 Framework Document that an RMC of 56 percent is realistic, and added that it will collect additional information to validate this estimate. (AHAM, STD No. 8 at p. 1.) Whirlpool stated that the weighted-average RMC from clothes washers that it sells in North America is approximately 56 percent and that a revised test procedure should use this value. (Whirlpool, STD No. 7 at pp. 1–2.) CEE, EEI, and ALS also support revising the clothes dryer test procedure to account for lower RMC. (CEE, STD No. 10 at p. 1; EEI, STD No. 5 at p. 2; ALS, STD No. 6 at p. 1) CEE added that the lower average RMC is likely due to recent improvements in clothes washers, particularly the entrance of horizontal-axis washers with high spin speeds and significantly reduced RMC. (CEE, STD No. 10 at p. 1.)

The Joint Comment also commented that a lower RMC for the clothes dryer test procedure is justified. The Joint Comment referenced CEC data for the relationship between residential clothes washer MEF and RMC, which shows that models just meeting current energy conservation standards have an average RMC of 55 percent. The Joint Comment also noted that a regression fit through the entire CEC data set shows a residential clothes washer with an MEF of 0.817 (which approximates pre-2001 standards) would have an estimated RMC of 72 percent, which is comparable to the value in the existing test procedure. (Joint Comment, STD No. 9 at pp. 12–13.)

DOE agrees that a review of the residential clothes washer models in the CEC database suggests that the average RMC is less than the nominal 70 percent which is currently provided in the DOE clothes dryer test procedure. Therefore, DOE considered amendments to the clothes dryer test procedure to address RMC.

As part of the preliminary analyses for the residential clothes dryers energy conservation standards rulemaking, DOE estimated the RMC of clothes washers using a distribution of values for models listed in the December 12, 2008, CEC product database. For products for which the RMC was listed, the RMC values ranged from 30 percent to 61 percent, with an average of 46 percent.

As part of the October 2007 Framework Document, DOE requested data from AHAM showing the shipments of residential clothes washers for which RMC was reported, along with shipment-weighted RMC (*See* Table 0.7). These data sets, each including disaggregated data for front-loading and top-loading clothes washers, as well as reported overall values for all units, provide insight into what initial clothes dryer RMC would be most representative of current residential clothes washers. However, as noted above, AHAM indicated that the data contains only shipments for which the RMC was reported and thus the total will not be equal to actual shipments reported for 2000–2008. The data indicate that RMC has been decreasing consistently, from about 54 percent in 2000 to 47 percent in 2008, and suggest that the initial RMC of nominally 70 percent in the DOE clothes dryer test procedure is greater than the current shipment-weighted residential clothes washer average RMC.

TABLE 0.7—AHAM SHIPMENT-WEIGHTED CLOTHES WASHER RMC DATA SUBMITTAL [34]

Year	Clothes washer shipments for which RMC was reported			Shipment-weighted RMC (%)		
	Front-loading	Top-loading	Total	Front-loading	Top-loading	Total
2000	232,714	686,440	919,154	43.6	57.4	53.9
2001	235,989	473,629	709,618	41.3	57.7	52.2
2002	280,667	529,265	809,932	41.5	58.1	52.3
2003	351,411	1,676,877	2,028,288	43.1	54.5	52.5
2004	1,179,813	5,270,285	6,450,098	42.2	52.8	50.9
2005	1,563,108	5,394,511	6,957,619	40.8	52.7	50.1
2006	1,851,218	5,628,279	7,479,497	39.3	51.4	48.4
2007	1,973,825	5,371,142	7,344,967	38.3	51.4	47.8
2008	2,043,024	4,492,059	6,535,083	38.1	51.0	47.0

Based on the shipment-weighted RMC data submitted by AHAM and DOE's own review of the CEC residential clothes washer database, DOE believes that an initial RMC of 47 percent is representative of current residential clothes dryer initial test load characteristics. Therefore, DOE is proposing in today's notice to amend section 2.7, "Test loads," of the clothes dryer test procedure to require that the initial RMC be changed from 70 ± 3.5 percent to 47 percent. DOE is not proposing to allow the ± 3.5 percent range in RMC because the proposed amendments to the DOE clothes dryer test procedure for automatic cycle termination, detailed in section III.C.2, would require that the test load be initially prepared to between 42- and 47-percent RMC, and that final adjustments be made to the RMC to achieve 47-percent ± 0.33-percent RMC, in order to account for over-drying energy consumption.

Alternatively, if DOE, in the final rule, does not adopt the proposed amendments in today's SNOPR for testing automatic cycle termination, presented in section III.C.2, but adopts only these aforementioned proposed amendments to change the initial RMC, DOE proposes to specify an initial RMC of 47 ± 3.5 percent. In that case, the tolerance of ± 3.5 percent on the nominal initial RMC, as currently specified in DOE's test procedure, would allow the same flexibility in test cloth preparation as is currently allowed. If DOE, in the final rule, does adopt the proposed amendments to account for automatic cycle termination, then the tolerance of ± 3.5 percent for the initial RMC would not be necessary. DOE welcomes comment on and additional data regarding the representative initial RMC for current dryer test loads.

DOE also notes that the current test procedure contains a provision in the calculation of per-cycle energy consumption that is intended to normalize EF by the reduction in RMC over the course of the drying cycle. A scaling factor of 66 is applied, which is representative of the percentage change from the nominal initial RMC of 70 percent to the nominal ending RMC of 4 percent. However, DOE notes that the proposed changes to account for automatic cycle termination, as presented above in section III.C.2, would require amending the calculations for the per-cycle energy consumption to remove the need for this scaling factor. Therefore, DOE is not proposing to amend the scaling factor in today's SNOPR. Alternatively, if DOE, in the final rule, does not adopt the proposed amendments in today's SNOPR for testing automatic cycle termination, presented in section III.C.2, but adopts only these aforementioned proposed amendments to change the initial RMC, DOE proposes to change the scaling factor to 43 to reflect a starting RMC of 47 percent. If DOE, in the final rule, does adopt the proposed amendments to account for automatic cycle termination, then changes to the scaling factor would not be necessary.

As noted above in section I, 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. In determining the amended energy conservation standard, the Secretary shall measure, pursuant to the amended test procedure, the energy efficiency, energy use, or water use of a representative sample of covered products that minimally comply with the existing standard. The average of such energy efficiency, energy use, or water use levels determined under the amended test procedure shall constitute the amended energy conservation standard for the applicable covered products. (42 U.S.C. 6293(e)(2))

As part of the October 2007 Framework Document, DOE requested data from AHAM to help evaluate the effect of a lower initial RMC on measured EF for clothes dryers which minimally comply with existing energy conservation standards. Table 0.8 lists and Figure 0.3 illustrates the data AHAM provided for the change in measured EF that was observed when initial RMC was reduced from nominally 70 percent to nominally 56 percent. When the scaling factor in the calculation of per-cycle energy consumption, described above, was changed to 52—reflecting a change in RMC during the test cycle from an initial 56 percent to a final 4 percent—measured EF increased by an average of 22 percent in AHAM's test sample of 11 baseline clothes dryers. Under these conditions, the average EF increased from 3.09 to 3.77 lb per kWh. When this scaling factor was left as 66 as currently provided for in the DOE test procedure, measured EF decreased by an average of 4 percent when initial RMC was reduced as described. In this case, average EF decreased from 3.09 to 2.97 lb per kWh.

[34] AHAM, 2009. *AHAM Weighted RMC for Front Load and Top Load Units, 2000–2008—DOE Clothes Dryer Rulemaking, Secondary Data Request.* July 7, 2009. Docket No. EE–2007–BT–STD–0010, Comment Number 18

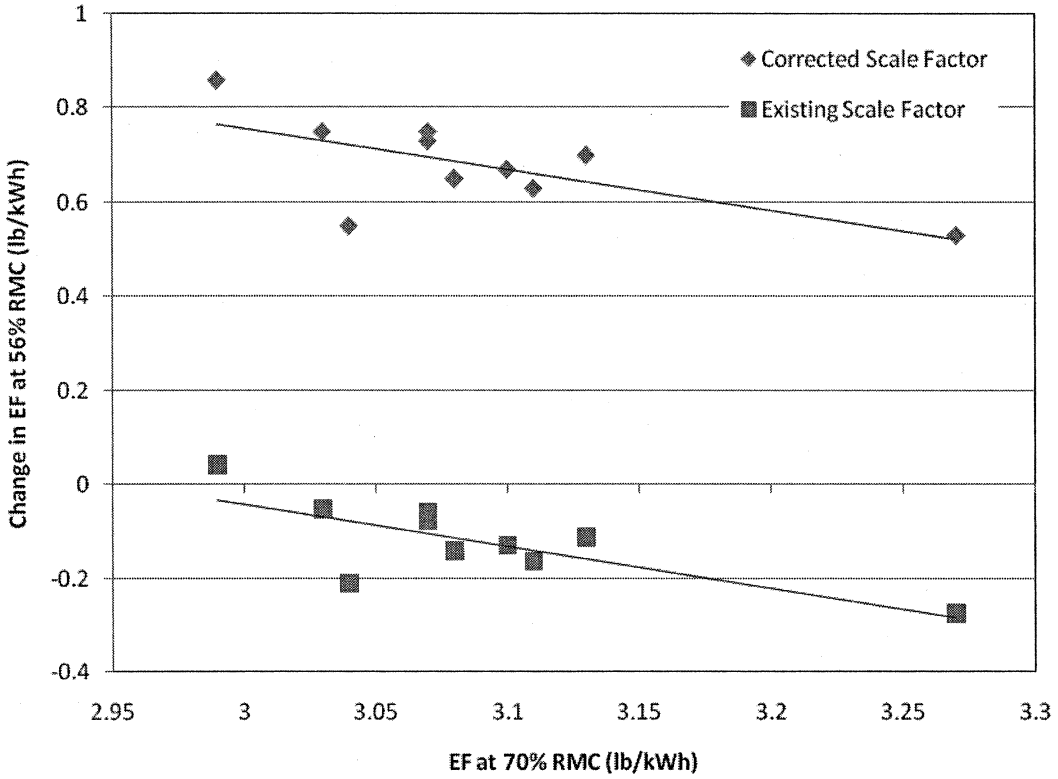

Figure 0.3 AHAM Data Submittal for the Impact of Initial RMC on Clothes Dryer Energy Factor

TABLE 0.8—AHAM DATA SUBMITTAL FOR THE IMPACT OF INITIAL RMC ON CLOTHES DRYER ENERGY FACTOR

Initial RMC *(%)*			Baseline Model EF (Using Existing Scaling Factor = 66)
Test	Target	Actual	
1a	.....	70	3.1
2a	.....	70.08	3.08
3a	.....	70.08	2.99
4a	.....	70.24	3.11
5a	.....	70.33	3.08
6a	70	70.17	3.07
7a	.....	69.7	3.07
8a	.....	71.6	3.27
9a	.....	70.5	3.03
10a	.....	70.9	3.13
11a	.....	70	3.04

Test	Target	Actual	Baseline Model EF (Using Revised Scaling Factor = 52)	Baseline Model EF (Using Existing Scaling Factor = 66)
1b	.....	56	3.77	2.97
2b	.....	55.99	3.73	2.94
3b	.....	55.99	3.85	3.03
4b	.....	55.99	3.74	2.95
5b	.....	58.43	3.73	2.94
6b	56	58.58	3.8	2.99
7b	.....	58.58	3.82	3.01
8b	.....	55.4	3.8	2.99
9b	.....	55.8	3.78	2.98
10b	.....	55.7	3.83	3.02
11b	.....	56	3.59	2.83

In order to supplement the data provided by AHAM, DOE conducted similar tests subsequent to the October 2007 Framework Document for one representative vented electric standard, vented electric compact (240 V), vented gas, and vent-less electric compact (240 V) clothes dryer in its test sample. DOE tested each of these units according to the current DOE clothes dryer test procedure, but changing the initial RMC from 70 percent ± 3.5 percent to 56 percent ± 1 percent and 39 percent ± 1 percent in order to evaluate the effects of lowering the initial RMC. DOE did not test an initial RMC of 47 percent because, at the time of testing, the shipment-weighted RMC data indicating 47 percent was representative of laundry loads after the residential clothes washer cycle was not yet available to DOE. Therefore, DOE selected a wider range of initial RMC values for testing, such that effects of changing the initial RMC to a value in between the tested values could be interpolated from the testing results. DOE selected models that minimally complied with energy conservation standards for clothes dryers, except for the one vent-less model (since vent-less clothes dryers are not currently subject to energy conservation standards.) DOE selected a vent-less unit with an EF it considered a baseline for evaluating efficiencies of vent-less products.

Table 0.9 shows the measured EF for each of the clothes dryers DOE tested at 70-percent, 56-percent, and 39-percent initial RMC, and the percentage change in EF for the reduced initial RMC compared to the 70-percent initial RMC required by the current DOE test procedure. DOE notes that the scaling factor in the calculations of per-cycle energy consumption was adjusted to 52 and 35 (from 66) for the initial RMCs of 56 percent and 39 percent, respectively, in order to represent the nominal change in percent from the initial RMC to the final RMC, as discussed above. The results from DOE testing indicate that, on average, measured EF increases by about 23 percent and 70 percent when the initial RMC is changed to 56 percent and 39 percent, respectively. DOE notes that the results showing a 23-percent increase in EF for the 56-percent initial RMC tests are in close agreement with AHAM's test results, which shows a 22-percent increase in measured EF.

TABLE 0.9—DOE TEST RESULTS EVALUATING REDUCED INITIAL RMC

Product Class	70% RMC	56% RMC		39% RMC	
	EF	EF	% Change	EF	% Change
Vented Electric Standard	3.09	3.86	25.0	5.39	74.6
Vented Electric Compact (240 V)	3.06	3.69	20.6	5.02	63.8
Vented Gas	2.81	3.43	21.9	4.79	70.5
Vent-less Electric Compact (240 V)	2.37	2.99	26.1	4.09	72.5
Average	.....	.....	23.4	.....	70.3

Plotting these test data reveals a non-linear trend in EF as a function of initial RMC, as seen in Figure III.4. DOE explored using a polynomial trend to fit the datasets in order to develop an estimate for the percentage change in EF resulting from changing the initial RMC to 47 percent, as proposed in today's SNOPR. Using the polynomial trends, an initial RMC of 47 percent would be predicted to increase measured EF by approximately 47 percent on average, as shown in Table 0.10.

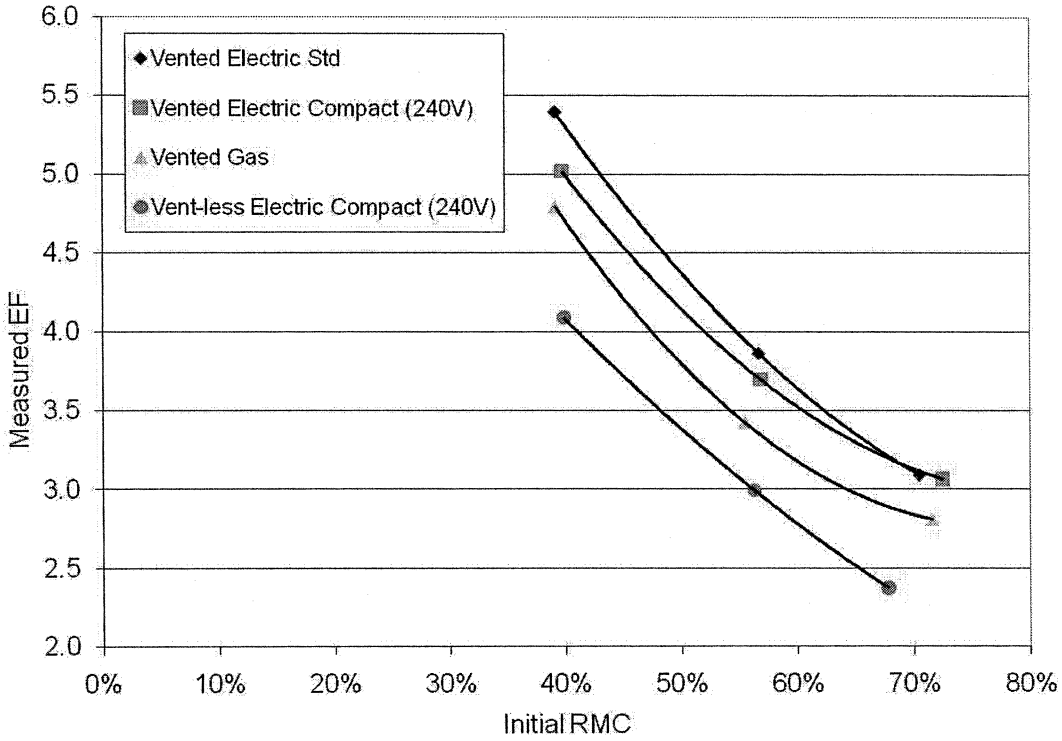

Figure 0.4 DOE Test Results for Measured Energy Factor versus Initial RMC

TABLE 0.10—CALCULATED ENERGY FACTOR USING POLYNOMIAL TREND FITS OF THE DOE TEST DATA

Product class	Calculated EF at 47% initial RMC	% Change from 70% initial RMC
Vented Electric Standard	4.63	49.8
Vented Electric Compact (240 V)	4.37	42.8
Vented Gas	4.04	43.5
Vent-less Electric Compact (240 V)	3.58	51.2
Average	.....	46.9

After this analysis was complete, DOE conducted testing of three identical maximum-available gas clothes dryers as part of its energy conservation standards rulemaking preliminary analyses for clothes dryers. These tests investigated the measured EF for this model according to the current DOE test procedure with an initial RMC of 70 percent ± 3.5 percent. In order to supplement the test procedure analysis discussed above, DOE subsequently conducted further testing on one of these maximum-available gas clothes dryers to evaluate the effects on EF of changing the initial RMC. DOE tested the unit according to the current DOE clothes dryer test procedure at reduced initial RMCs of 56 percent ± 3.5 percent and 47 percent ± 3.5 percent. For each initial RMC, DOE conducted three tests for the test unit to determine if the results were repeatable. Table 0.11 below shows the results from this testing, which indicate that, on average, measured EF increases by about 24 percent and 41 percent when the initial RMC is reduced to 56 percent and 47 percent, respectively. DOE notes that the results showing a 24-percent increase in EF for the 56-percent initial RMC tests are in close agreement with the AHAM data submittal and previous DOE test results.

TABLE 0.11—DOE TEST RESULTS EVALUATING REDUCED INITIAL RMC USING MAXIMUM-AVAILABLE GAS CLOTHES DRYER

Test run	70% RMC	56% RMC		47% RMC	
	EF	EF	% change	EF	% change
1	2.81	3.51	24.3	3.87	37.1
2	2.82	3.52	24.6	4.04	43.2
3	2.83	3.50	23.9	4.00	41.7
Average	2.82	3.51	24.3	3.97	40.6

Based on its testing, DOE believes that a 41-percent increase in EF resulting from switching from 70-percent to 47-percent initial RMC for a minimally compliant clothes dryer is representative. For this reason, DOE believes that the current energy conservation standards in terms of EF for vented clothes dryer product classes would need to be increased by 41 percent, based upon the proposed amendments to change the initial RMC from 70 percent ± 3.5 percent to 47 percent ± 3.5 percent. DOE would consider addressing this change in the concurrent energy conservation standards rulemaking for residential clothes dryers, for which a final rule is scheduled for publication by June 30, 2011.

c. Clothes Dryer Test Load Weight

The current DOE clothes dryer test procedure requires a 7.00 lb ± .07 lb test load for standard-size dryers and a 3.00 lb ± .03 lb test load for compact-size dryers. The Joint Comment stated in response to the October 2007 Framework Document that DOE should determine whether the average test load weight for standard-capacity dryers is consistent with the current generation of washer capacities. The Joint Comment noted that, according to AHAM data, the average tub volume of washers has been increasing for a number of years. The Joint Comment indicated that between 1981, when the dryer testing protocol was established, to 2004, the average washer tub volume increased by more than 20 percent (2.52 cubic feet (ft^3) to 3.05 ft^3). The Joint Comment also pointed out that, in the current DOE clothes washer test procedure, the maximum test load weight of a 2.52 ft^3 machine is 10.5 lb, while the maximum test load weight of a 3.05 ft^3 machine is 12.5 lb. The Joint Comment stated that if the ratio of the maximum test load weights were applied to the test load weight in the clothes dryer test procedure, this would imply that the current 7-lb test load weight should be adjusted upward by about 20 percent to 8.3 lb. The Joint Comment added that DOE should request that manufacturers provide field data to document whether the current test load weight for standard-capacity dryers should be adjusted upward to account for the increased capacity of residential clothes washers. The Joint Comment also stated that DOE should interview detergent manufacturers since they are among the most knowledgeable parties in the laundry industry. Because the size of the load affects proper detergent dosing, the Joint Comment stated that detergent manufacturers are likely to have data on current load weights. (Joint Comment, STD No. 9 at pp. 11–12)

DOE contacted detergent manufacturers to obtain data on average residential clothes washer load sizes. Procter and Gamble (P&G) conducted an internal study in 2003 on household laundry habits on a representative set of the population across the United States, from which P&G provided select summary data to DOE for this rulemaking. The clothes washer load weight data, which was based on a sample size of 3367 loads of laundry from a total of 510 respondents, showed that the average load size for top-loading and front-loading clothes washers was 7.2 lb and 8.4 lb, respectively. (P&G, No. 15 at p. 1) Based on the average shipment-weighted market share for top-loading and front-loading clothes washers between 2000 and 2008 from data submitted by AHAM (shown in Table 0.7), the shipment-weighted average clothes washer load size would be approximately 7.5 lbs. However, DOE recognizes that clothes washer capacities were likely to have increased since the survey was conducted in 2003, and therefore DOE continued its analysis to factor in these capacity changes to estimate a more current average load size.

Table 0.12 shows the trends of the shipment-weighted average tub volume for residential clothes washers from 1981 to 2008, based on data from the AHAM *Trends in Energy Efficiency 2008.* The shipment-weighted average tub volume has increased from 2.52 ft^3 in 1981 to 3.22 ft^3 in 2008.

TABLE 0.12—RESIDENTIAL CLOTHES WASHER SHIPMENT-WEIGHTED AVERAGE TUB VOLUME TRENDS [35]

Year	Shipment-weighted average tub volume (ft^3)	% change since 1990
1981	2.52	
1990	2.63	
1991	2.72	3.4
1992	2.71	3.0
1993	2.71	3.0
1994	2.69	2.3
1995	2.72	3.4
1996	2.80	6.5
1997	2.83	7.6
1998	2.85	8.4
1999	2.89	9.9
2000	2.92	11.0
2001	2.96	12.5
2002	2.96	12.5
2003	3.01	14.4
2004	3.05	16.0
2005	3.08	17.2
2006	3.13	19.2
2007	3.16	20.3
2008	3.22	22.4

Section 2.7, "Test Load Sizes," in the DOE clothes washer test procedure provides the minimum, maximum, and average test load size requirements for the clothes washer test, which is determined based on the clothes container capacity. Table 0.13 shows the minimum, maximum, and average test load sizes for 2.52 ft^3 and 3.22 ft^3 container capacities, determined according to Table 5.1 in the DOE clothes washer test procedure.

TABLE 0.13—DOE CLOTHES WASHER TEST LOAD SIZE REQUIREMENTS

[Table 5.1 of 10 CFR 430 Subpart B, Appendix J1]

Container volume (ft^3)	Minimum load (lb)	Maximum load (lb)	Average load (lb)
≥2.50 to <2.60	3.00	10.50	6.75
≥3.20 to <3.30	3.00	13.30	8.15

[35] Association of Home Appliance Manufacturers, *Trends in Energy Efficiency 2008.* Available at: *http://www.aham.org/ht/d/Store.*

DOE notes that the average load size in the clothes washer test procedure increases by about 21 percent with the associated increase in capacity, which DOE believes proportionally impacts clothes dryer load sizes. Applying this ratio of average clothes washer test load sizes to the clothes dryer test load size would result in an increase from 7.00 lb to 8.45 lb for standard-size dryers. For these reasons, DOE is proposing to amend the clothes dryer test load size to 8.45 lb for standard-size dryers. 10 CFR part 430, subpart B, appendix D, revised section 2.7.2. DOE is proposing to amend the test load size based on the change in average load size for clothes washers rather than the maximum load size because data from RECS 2005 indicates that not all clothes that are washed are machine dried. Therefore, DOE believes that average clothes washer load size would be more representative of clothes dryer load size. DOE is also proposing to maintain the 1-percent tolerance in load sizes specified by the current DOE test procedure for both standard-size dryers (8.45 lb ± .085 lb).

DOE believes most compact clothes dryers are used in conjunction with compact-size clothes washers, and DOE does not have any information to suggest that the tub volume of such clothes washers has changed significantly. Therefore, DOE is not proposing to change the 3-lb test load size currently specified in the test procedure for compact clothes dryers. DOE welcomes data on the historical trends of compact-size clothes washer average tub volumes or any other data that would suggest a change in the clothes dryer test load size for compact clothes dryers.

As noted previously, EF for clothes dryers is the bone-dry test load weight divided by the clothes dryer energy consumption per cycle. DOE notes that the proposed amendments to the test load size would increase both the bone-dry test load weight and the energy consumption per cycle. For example, for a test in which the nominal RMC of the test load is reduced from an initial 70 percent to a final 4 percent, an 8.45-lb test load would require about 5.6 lb of water to be removed during the drying cycle, whereas a 7-lb test load would require only 4.6 lb of water to be removed. DOE also notes that, as lower nominal RMCs are reached at the end of the test cycle, the rate and efficiency of water removal from the load would be higher for the larger test load simply because there would be more water in the load, hence making it easier to remove.

In order to determine a quantifiable estimate of the change in the measured EF, DOE reviewed research and investigations of the effects of changing the load size on the measured efficiency. The National Institute of Standards and Technology (NIST) conducted testing to investigate the effects of changing the clothes dryer load size on the measured efficiency for a vented electric standard clothes dryer with a capacity of 6.3 ft^3.[36] NIST tested the clothes dryer according to the DOE clothes dryer test procedure, except the test load size was varied from 2 lb to 15 lb. Table 0.14 presents the results of the NIST testing, which shows an increase in EF when increasing the load size within the range of interest (*i.e.,* from 7 lb to 9 lb).

TABLE 0.14—NIST VENTED ELECTRIC STANDARD CLOTHES DRYER VARIABLE TEST LOAD DATA

Test number	1	2	3	4	5	6	7	8
Room Temperature, °*F*	74.1	74.4	73.8	73.3	73.8	74.1	74.4	74.4
Room Humidity, %	40	38	38	33	42	38	40	36
Nominal Bone-Dry Weight, *lb*	2	3	5	7	9	11	13	15
Measured Bone-Dry Test Load Weight, *lb*	1.99	2.99	4.99	7.00	8.99	10.98	13.01	15.01
Measured Dry Test Load Weight, *lb*	2.05	3.06	5.17	7.99	9.11	11.56	13.57	15.71
Measured Wet Test Load Weight, *lb*	3.40	5.10	8.50	11.89	15.34	18.98	22.04	25.56
Measured Energy Consumption, *kWh*	0.953	1.159	1.593	2.112	2.667	3.250	3.796	4.384
Initial RMC, %	70.30	70.67	70.52	69.99	70.67	72.81	69.35	70.34
Final RMC, %	2.84	2.48	3.73	2.88	1.28	5.27	4.29	4.67
Per-Cycle Energy Consumption, *kWh*	0.970	1.167	1.637	2.160	2.638	3.303	4.005	4.582
EF, *lb/kWh*	2.06	2.56	3.04	3.24	3.41	3.33	3.25	3.27
Percentage Change in EF Compared to 7-lb Test, %	-36.6	-20.9	-6.0	0.0	5.2	2.7	0.3	1.1

DOE estimated the percentage change in EF for an 8.45-lb test load by linearly interpolating the results for the 7-lb and 9-lb tests. Using this method, the EF would increase by about 3.8 percent when increasing the test load size from 7 lb to 8.45 lb. DOE believes that this percentage change in EF can be applied to all vented standard-size clothes dryer product classes because it believes the moisture removal mechanisms are comparable among them. For these reasons, DOE believes that the current energy conservation standards in terms of EF for vented standard-size clothes dryer product classes would need to be increased by 3.8 percent, based upon the proposed amendments to increase the test load size to 8.45 ± .085 lb for standard-size dryers. DOE would consider addressing this change in the concurrent energy conservation standards rulemaking for residential clothes dryers, for which a final rule is scheduled for publication by June 30, 2011. DOE welcomes comment and data on current clothes dryer test load sizes and additional data showing the effects of changing the clothes dryer test load size on the measured EF for both standard-size and compact-size clothes dryers.

d. Room Air Conditioner Annual Operating Hours

The DOE test procedure currently assumes room air conditioners have an average annual use of 750 hours. DOE's technical support document from September 1997, issued in support of the most recent room air conditioner energy conservation standards

[36] J. Y. Kao. 1999. Energy Test Results of a Conventional Clothes Dryer and a Condensing Clothes Dryer. *International Appliance Technical Conference, 49th. Proceedings. May 4–6, Columbus, OH, pp. 11–21, 1998.*

rulemaking, shows that the average annual operational hours are closer to 500 hours,[37] which would yield approximately 33-percent lower annual energy consumption than the annual energy consumption determined using the 750 operational hours assumed in the current test procedure.

AHAM commented in response to the October 2007 Framework Document that the room air conditioner test procedure should be changed to account for fewer annual operating hours. (AHAM, STD No. 8 at p. 2.) The Joint Comment stated that DOE should update the room air conditioner test procedure for annual operating hours to reflect the best available information and to seek justification other than manufacturer assertions. The Joint Comment suggested checking the New York State Energy Research and Development Authority (NYSERDA) or the New York Department of Public Service, which have considerable ratepayer investments in changing out room air conditioners for more efficient models, and analysis to support this program may include data on hours of operation. (Joint Comment, STD No. 9 at p. 8) CEE also believes that DOE should research the number of annual hours of usage and does not believe that the hours have declined from 750 to 500. CEE believes the number of annual hours is higher, citing a study by the Northwest Power & Planning Council's Regional Technical Forum, which is claimed to represent a low usage area, which found the average annual operating hours to be 628. (CEE, STD No. 10 at p. 2.)

DOE recognizes the uncertainty regarding room air conditioner usage patterns, and determined to investigate the annual hours of usage from a range of information sources to develop as accurate an estimate of annual operating hours as possible. DOE's investigation revealed a lack of metered and survey data for the operating hours of individual room air conditioners. DOE found that estimates of the annual operating hours of use were often based on regional climatic data rather than actual room air conditioner use. DOE did find two sources of survey data on room air conditioner use in the EIA's 2005 RECS (and previous versions) and the CEC California Statewide RASS. The CEC survey contained only aggregated residential data, which limited any analysis pertaining to the annual operating hours. Its regional scope also limited the relevance of the data. EIA's 2005 RECS provides extensive data on individual residences, while providing a more expansive and representative sample of households. Thus, DOE continued its analysis using EIA's 2005 RECS.

DOE reviewed data from the EIA's 2005 RECS to determine the annual usage of room air conditioners. As noted above, RECS is a national sample survey of housing units that collects statistical information on the consumption of and expenditures for energy in housing units along with data on energy-related characteristics of the housing units and occupants. RECS provides enough information to establish the type (*i.e.,* product class) of room air conditioner used in each household, the age of the product, and also provides an estimate of the household's annual energy consumption attributable to the room air conditioner. As a result, DOE was able to develop a household sample for the annual hours of use of a room air conditioner, which was used to calculate a weighted national average of room air conditioner usage hours. The data in the 2005 RECS indicates that the estimated room air conditioner average annual usage is 810 hours. This number of hours is higher than the current 750 hours of the test procedure, and significantly higher than the approximately 500 hours suggested by the previous energy conservation standard rulemaking analysis.

An investigation of the 2005 cooling season covered by RECS indicates that there were roughly 12-percent more cooling degree days (CDD) in 2005 than the 30-year 1971 to 2000 average. CDD is a sum of the difference between ambient temperature in °F and 65 °F for every hour of the year that the ambient temperature is higher than 65 °F for a given location, divided by 24 to convert from hours to days; DOE used data on CDD from the National Solar Radiation Database (NSRDB).[38] The Annual Energy Outlook projections of CDD for the future suggest that the higher level of CDD will continue.[39] Hence, the year 2005 can be considered representative of future climate, and the predictions of annual hours based on the 2005 RECS is relevant within a certain level of uncertainty. However, DOE does not consider the increase of 60 hours from 750 hours to 810 hours to be significant, because it does not exceed the uncertainty level associated with the RECS-based approach for estimation of this value. Hence, DOE is not proposing a change at this time in the annual operating hours used in the test procedure.

e. Room Air Conditioner Part-Load Performance

DOE noted in the October 2007 Framework Document that the current DOE room air conditioner test procedure measures full-load performance, and is not able to assess energy savings associated with technologies which improve part-load performance. AHAM commented that the room air conditioner test procedure should not include part-load performance or seasonal energy efficiency ratio (SEER) ratings, stating that these are not realistic or applicable to room air conditioners. According to AHAM, room air conditioners are a commodity item with a compressor that operates only in on/off mode, and that consumers historically have not been willing to pay for part-load performance options. (AHAM, STD No. 8 at p. 2; AHAM, Public Meeting Transcript, STD No. 4.6 at p. 24.) CEE commented that peak-load performance is of greater significance for room air conditioners than part-load performance. CEE recommended a two-part reporting requirement based on both EER and SEER. CEE stated that including part-load operation in the test procedure would have more relevance for milder climates. (CEE, STD No. 10 at p. 2.) NRDC commented that if just one energy-use metric is used, it should be EER, since peak-load performance is most important for room air conditioners, and because it is difficult to develop a SEER test procedure that accurately reflects real-world performance. However, NRDC recommended the use of two energy-use metrics—one for peak-load performance and one for part-load performance. (NRDC, Public Meeting Transcript, STD No. 4.6 at pp. 25–26.) ACEEE commented that a SEER rating is not appropriate for room air conditioners due to their impact on utility peak demand. (ACEEE, Public Meeting Transcript, STD No. 4.6 at p. 25.) Finally, the Joint Comment stated that there is no compelling reason to change from an EER rating, and that if a SEER rating is considered, it should be used in addition to EER. (Joint Comment, STD No. 9 at p. 8.)

DOE has concluded that widespread use of part-load technology in room air conditioners would probably not be stimulated by the development of a part-

[37] U.S. Department of Energy, *Technical Support Document for Energy Conservation Standards for Room Air Conditioners.* September 1997. Chapter 1, section 1.5. *http://www.eere.energy.gov/buildings/appliance_standards/residential/room_ac.html.*

[38] National Renewable Energy Laboratory, *National Solar Radiation Database 1991–2005 Update: User's Manual,* 2007. Available online at: *http://www.nrel.gov/docs/fy07osti/41364.pdf.*

[39] Energy Information Administration, *2006 State Energy Consumption, Price, and Expenditure Estimates (SEDS),* 2006. Washington, DC. Available online at: *http://www.eia.doe.gov/emeu/states/_seds.html.*

load metric, and, hence, the significant effort of development of an accurate part-load metric is not likely to be warranted by the expected minimal energy savings. A part-load metric would measure efficiency of a product when operating at conditions other than maximum capacity and/or with outdoor or indoor conditions cooler than currently used in the DOE active mode energy test. In-field use of room air conditioners with currently available technologies, when enough cooling is provided to the space, any number of events can occur to prevent over-cooling: the user may turn off the unit or adjust fan speed; or the controls might turn off the compressor, turn off both the compressor and the fan, or reduce fan speed. Delivery of cooling might be done more efficiently with part-load technologies, such as a compressor that can adjust its capacity rather than cycling on and off. However, sufficient information is not available regarding use of room air conditioner features to assess whether such alternative technologies would be cost effective. While a part-load metric would be a different measurement, it still measures the efficiency of the product's delivery of cooling. The key design changes that improve full-load efficiency also improve part-load efficiency, so the existing EER metric is already a strong indication of product efficiency over a wide range of conditions. DOE concludes that the argument to develop an additional test for part load, or to change the room air conditioner metric to a part-load test, is not supported by available information. Also, because any part-load performance metric would address the same major function (cooling) as EER, DOE cannot consider a two-part performance metric including a part-load performance metric (42 U.S.C 6295 (o)(5)). Therefore, DOE does not plan to consider amendments to its room air conditioner test procedure to measure part-load performance.

f. Room Air Conditioner Ambient Test Conditions

DOE also considered whether the ambient test conditions in its test procedure for room air conditioners are representative of typical installations. The Joint Comment recommended increasing the ambient temperature of the DOE energy test procedure from 95 °F to 115 °F, stating that room air conditioners are generally operated when the outdoor temperatures are the highest, and that they are often located on the south or west side of residences where the sun can shine on them during operation. (Joint Comment, STD No. 9 at p. 9.) DOE did not receive further information to support the specification of the higher temperature, and, therefore, is not considering an amendment to the ambient test conditions specified in the room air conditioner test procedure at this time. DOE welcomes comment and data indicating representative ambient test conditions for room air conditioners, and how changes to the ambient test conditions would affect the measured efficiency, in particular on units that minimally comply with current energy conservation standards.

6. Room Air Conditioner Referenced Test Procedures

The room air conditioner test procedure cites two test standards that are each at least 25 years old: (1) ANS Z234.1–1972 and (2) ASHRAE Standard 16–69. Both the ANS (since renamed ANSI) and ASHRAE standards have been updated since DOE last revised its room air conditioner test procedure. The current standards are ANSI/AHAM RAC–1–R2008 and ANSI/ASHRAE Standard 16–1983 (RA 2009), respectively. Because it is likely that any manufacturer rating it products is using the most recent test standards, DOE suggested in the October 2007 Framework Document to consider updating its test procedure to incorporate by reference the most recent test standards. DOE sought comment on such a test procedure revision.

AHAM and EEI both commented in response to the October 2007 Framework Document that the room air conditioner test procedure should be amended to reference the most recent ANSI and ASHRAE test standards. (AHAM, STD No. 8 at p. 2; EEI, STD No. 5 at p. 2.)

Based on these comments on the October 2007 Framework Document, DOE reviewed the differences between the test standards currently referenced by the DOE test procedure and the latest versions of these standards in order to determine if amendments to reference the latest ANSI and ASHRAE test standards are appropriate. DOE notes that the sections that would be referenced in ANSI/AHAM RAC–1–R2008 by the DOE test procedure do not introduce any new changes in the measurement of cooling capacity or power input. DOE also notes that the sections that would be referenced in ANSI/ASHRAE Standard 16–1983 (RA 2009) by the DOE test procedure would introduce changes to the determination of capacity, four new temperature measurements, and changes to the test tolerances. DOE further notes that the referenced section numbers from the old and current test standards are identical. The following discussion details the differences between the test standards.

ANSI/AHAM RAC–1–R2008 includes references to "the latest editions of ASHRAE Standard 16" and "ASHRAE Standard 58"[40] while ANS Z234.1–1972 cites ASHRAE Standard 16–1969. ANSI/AHAM RAC–1–R2008 also revised the wording of the "Nameplate" and "Voltages for Standard Measurement Test" requirements in section 5 of ANS Z234.1–1972, and included differences in rounding converted Celsius temperatures in the tolerances listed in section 4 of ANS Z234.1–1972. However, these changes do not measurably alter the measured efficiency from the value that would be obtained using the existing DOE test procedure. ANSI/AHAM RAC–1–R2008 also specifies different heating capacity test conditions as compared to ANS Z234.1–1972. It increases the outdoor side temperature from 45 °F to 47 °F, and specifies a maximum wet-bulb temperature of 60 °F for the indoor side, whereas ANS Z234.1–1972 has no such requirement for the maximum wet-bulb temperature. DOE notes that the changes to the heating capacity test conditions do not affect the measurement and calculation of cooling capacity and EER.

ANSI/ASHRAE Standard 16–1983 (RA 2009) requires reporting of four additional temperatures that are not explicitly specified in ASHRAE Standard 16–1969:

1. "Wet-bulb temperature of air leaving room side of air conditioner;"
2. "Dry-bulb [* * *] temperature of air surrounding inner compartments of balanced ambient calorimeter;"
3. "Wet-bulb temperature of air surrounding inner compartments of balanced ambient calorimeter;" and
4. "Dry-bulb temperature of air surrounding calibrated room type calorimeter"

The first additional temperature allows for flexibility in determining the condensate temperature measurement. The first additional temperature can be assumed the temperature of the condensate, since it is difficult to measure the temperature of the condensed moisture being transferred within the room air conditioner. This temperature is then used to calculate the "enthalpy of condensed moisture leaving the room-side compartment," which is an input for the calculation of the cooling capacity. While ASHRAE Standard 16–1969 mentions that the "wet-bulb temperature of the air leaving the air conditioner" may be used as the

[40] ASHRAE Standard 58, "Method of Testing for Rating Room Air Conditioner and Packaged Terminal Air Conditioner Heating Capacity"

temperature of the condensate, under the calculation of "net total room-cooling effect," it does not include this temperature in Table 2, "Data to be recorded for cooling-capacity tests." ANSI/ASHRAE Standard 16–1983 (RA 2009) adds this temperature to Table 2.

The remaining temperatures measure the conditions outside of either the calibrated room-side calorimeter set-up or the balanced ambient calorimeter set-up, and assist in calculating the heat leakages in the capacity calculation. The "dry-bulb and wet-bulb air temperatures surrounding [the] balanced ambient calorimeter" are mentioned in Table 1 of ANSI/ASHRAE Standard 16–1983 (RA 2009) as part of the rating conditions for the capacity test, but are not explicitly mentioned in Table 2. ANSI/ASHRAE Standard 16–1983 (RA 2009) adds these temperature measurements and the "dry-bulb temperature of air surrounding calibrated room type calorimeter," which is the equivalent temperature measurement for the calibrated room-type calorimeter introduced in section 4 of ANSI/ASHRAE Standard 16–1983 (RA 2009) to Table 2.

ANSI/ASHRAE Standard 16–1983 (RA 2009) also adds requirements for periodic calibration of instruments and chambers to verify the accuracy of the instruments and the performance of the indoor room-side compartment. Section 6.1.1 of ANSI/ASHRAE Standard 16–1983 (RA 2009) states that "the performance of the indoor room-side compartment" should be verified according to industry standards "at least every six months." Section 5.7 of ANSI/ASHRAE Standard 16–1983 (RA 2009) also adds the requirement to verify the accuracy of all instruments "at least annually" according to recognized standards. These requirements will add some burden to manufacturers but the low yearly occurrence will limit the overall burden, while ensuring the accuracy and repeatability of the test results.

ANSI/ASHRAE Standard 16–1983 (RA 2009) also adjusts the tolerances on the wet-bulb and dry-bulb temperatures measurements used to support calculation of airflow, to 1 °F from 0.5 °F. These temperature measurements are used to determine the density of the air for calculating the room-side calorimeter airflow. The change in required tolerance for wet-bulb and dry-bulb air temperatures may have a slight impact due the possible introduction of additional error of about 0.1 percent on the airflow measurements, but other measurement tolerances have a greater impact on the value of the airflow measurements. In particular, the differential pressure measurement tolerance of 0.005 inches of water listed in section 5.3.1 of ANSI/ASHRAE Standard 16–1983 (RA 2009) can introduce a larger uncertainty to the airflow measurement, making the change in temperature tolerance negligible in comparison. Thus, the effect on the measured airflow due to the change in tolerances will be negligible.

Section 4.2.1 of ANSI/ASHRAE Standard 16–1983 (RA 2009) "provides a method for determining cooling capacity on the room side only," subject to restrictions, whereas ASHRAE Standard 16–1969 determines cooling capacity using both room-side and outdoor-side calorimetry. Section 4.2.1 of ANSI/ASHRAE Standard 16–1983 (RA 2009) also states, "the outdoor-side capacity, if measured, provides a confirming test of the cooling and dehumidifying effect." The room-side capacity measurement is made independently of the outdoor-side measurement, and, due to the additional calibration of the compartments detailed in Section 6.1.1 of ANSI/ASHRAE Standard 16–1983 (RA 2009), provides an accurate and verifiable representation of the cooling capacity without the outdoor-side capacity determination.

Section 6.1.3 of ANSI/ASHRAE Standard 16–1983 (RA 2009) also introduces a correction factor based on the test room condition's deviation from the standard barometric pressure of 29.92 inches (in.) of mercury (Hg) (101 kilopascal (kPa)). Section 6.1.3 of ANSI/ASHRAE Standard 16–1983 (RA 2009) states that the cooling capacity may be increased 0.8 percent for each in. Hg below 29.92 in. Hg (0.24 percent for each kPa below 101 kPa). This change would not impact the measured efficiency of units tested at standard testing conditions. The capacity correction factor provides manufacturers with more flexibility in the test room conditions while normalizing results to standard conditions.

DOE further believes that additional changes in the methodology of the test procedure introduced by ANSI/ASHRAE Standard 16–1983 (RA 2009), such as the ability to use one calibrated calorimeter instead of two, will not measurably affect the measured EER and will provide greater flexibility in the measurement of room air conditioner parameters. Additional calibration of the instruments will have no effect on the measured efficiency, but will instead ensure accuracy and repeatability of testing results over time. The change in required tolerance for wet-bulb and dry-bulb air temperatures may have a slight impact on measured EER due the possible introduction of additional error of 0.1 percent on the airflow measurements, but other measurement tolerances already have a greater impact on the accuracy of the value of the airflow measurements. Therefore, DOE believes this effect will be negligible. DOE concludes that the updated test procedure would not have a measurable impact on the measured efficiency of current room air conditioners and units that complied with the energy conservation standards for room air conditioners according to the current test procedure are expected to be able to comply when tested according to the proposed test procedure.

In sum, DOE has reviewed the most recent revisions of the referenced test standards, ANSI/AHAM RAC–1–R2008 and ANSI/ASHRAE Standard 16–1983 (RA 2009), and has determined that incorporation by reference of these versions provide more accurate and repeatable measurements of capacity while providing greater flexibility to manufacturers in selecting equipment and facilities, and does not add any significant testing burden. Furthermore, these revisions would not impact the measurement of EER for this equipment. DOE also believes that manufacturers may already be using these updated standards in their testing. Therefore, DOE is proposing in today's SNOPR to amend the DOE test procedure to reference the relevant sections of ANSI/AHAM RAC–1–R2008 and ANSI/ASHRAE Standard 16–1983 (RA 2009).

If DOE determines that the proposed amendments to reference the updated room air conditioner test standards ANSI/AHAM RAC–1–R2008 and ANSI/ASHRAE Standard 16–1983 (RA 2009), discussed above, are not appropriate for the DOE room air conditioner test procedure, DOE would propose to correct the text regarding the referenced room air conditioner test standards, as proposed in the December 2008 TP NOPR. The room air conditioner test procedure currently references ASHRAE Standard 16–69, "Method of Testing for Rating Room Air Conditioners." The text in 10 CFR part 430, subpart B, appendix F, section 1, however, incorrectly identifies ASHRAE as "American Society of Heating, Refrigerating and Air Conditioning in Engineers." The actual name of the referenced organization is "American Society of Heating, Refrigerating and Air-Conditioning Engineers." DOE proposed to correct this reference in 10 CFR part 430, subpart B, appendix F, section 1 (which is being redesignated as section 2 in the

proposed amendments) in the December 2008 TP NOPR. 73 FR 74639, 74650. DOE did not receive any comments opposing this correction. Therefore, DOE would continue to propose the above text corrections regarding the referenced room air conditioner test standard if it decides not to amend the DOE room air conditioner test procedure to reference ANSI/AHAM RAC–1–R2008 and ANSI/ASHRAE Standard 16–1983 (RA 2009).

7. Clothes Dryer Referenced Test Procedure

The DOE clothes dryer test procedure currently references the industry test standard AHAM Standard HLD–1–1974, "AHAM Performance Evaluation Procedure for Household Tumble Type Clothes Dryers" (AHAM Standard HLD–1–1974.) Specifically, the DOE clothes dryer test procedure requires that the clothes dryer under test be restricted by adding the AHAM exhaust simulator described in section 3.3.5 of AHAM Standard HLD–1–1974. The AHAM test standard has been updated since DOE established its clothes dryer test procedure. The current standard is designated as AHAM Standard HLD–1–2009. Because it is likely that any manufacturer rating it products is using the most recent test standard, DOE considered potential amendments to its clothes dryer test procedure to reference AHAM Standard HLD–1–2009. DOE notes that section 3.3.5.1 of AHAM Standard HLD–1–2009 regarding exhausting conditions provides the same requirements for the exhaust simulator as required by AHAM Standard HLD–1–1974. For this reason, DOE is proposing in today's SNOPR to amend the DOE test procedure to reference AHAM Standard HLD–1–2009. Because the requirements for the exhaust simulator would be the same, DOE believes that the proposed amendments would not affect the EF rating of residential clothes dryers and would not require revisions of the existing energy conservation standards for these products.

DOE also recognizes that the newly issued AHAM Standard HLD–1–2009 allows for the optional use of a modified exhaust simulator, which is included as a more convenient option than the exhaust simulator originally specified for testing vented clothes dryers. The requirements for the modified exhaust simulator are presented in section 3.3.5.2 of AHAM Standard HLD–1–2009. The test standard notes that only limited testing has been done to compare results using the two exhaust simulators, and that users are invited to submit results and comments for both options. Because this modified exhaust simulator is new and limited data exists to compare the effects of using different exhaust simulators, DOE will continue to require the standard exhaust simulator currently referenced by the DOE clothes dryer test procedure. However, DOE welcomes data from manufacturers comparing the effects of the two exhaust simulators on the drying efficiency using the DOE test procedure. DOE also welcomes comment on whether the test procedure should be amended to allow for the optional modified exhaust simulator.

Section 1.8 in the "Definitions" section of the DOE clothes dryer test procedure also references an obsolete AHAM clothes dryer test standard, AHAM Standard HLD–2EC, "Test Method for Measuring Energy Consumption of Household Tumble Type Clothes Dryers," December 1975. No provisions of this test standard are currently used in DOE's test procedure, and, therefore, DOE proposes to remove this reference. DOE welcomes comment on this proposal.

8. Technical Correction for the Per-Cycle Gas Dryer Continuously Burning Pilot Light Gas Energy Consumption

The equation provided under section 4.4 ("Per-cycle gas dryer continuously burning pilot light gas energy consumption") of the current DOE clothes dryer test procedure contains a technical error in the equation for calculation of the per-cycle gas dryer continuously burning pilot light gas energy consumption, E_{up}, in Btu's per cycle. E_{up} is the product of the following three factors: (A) The cubic feet of gas consumed by the gas pilot in hour; (B) the total number of hours per year the pilot is consuming gas while the dryer is not operating in active mode (8,760 total hours per year minus 140 hours per year the dryer operates in active mode) divided by the representative average number of clothes dryer cycles in a year (416); and (C) the corrected gas heat value. Part (B) of this equation is currently incorrect, reading (8760—140/416) and missing the appropriate parentheses. The equation should correctly subtract the total number of hours per year the pilot is consuming gas while the dryer is not operating in active mode from the number of hours per year the dryer operates in active mode, before dividing by the average number of dryer cycles in a year. The equation should read ((8760—140)/416) to correctly calculate the per-cycle gas dryer continuously burning pilot light gas energy consumption. Therefore, DOE proposes in today's SNOPR to amend the equation, as discussed above, to correctly calculate the per-cycle gas dryer continuously burning pilot light gas energy consumption.

9. Clarification of Gas Supply Test Conditions for Gas Clothes Dryers

Section 2.3.2.1 and 2.3.2.2 of the DOE clothes dryer test procedure specifies maintaining "the gas supply to the clothes dryer at a normal inlet test pressure immediately ahead of all controls at" 7 to 10 inches of water column for natural gas or 11 to 13 inches of water column for propane gas. DOE believes that the references to "normal inlet test pressure" in sections 2.3.2.1 and 2.3.2.2 of its clothes dryer test procedure, which are provided to specify natural gas and propane supply pressure test conditions, respectively, may be confusing as to what is meant by the term "normal." DOE believes that such language is not necessary because the gas supply pressure immediately ahead of all controls is explicitly stated as either 7 to 10 inches water column for natural gas or 11 to 13 inches of water column for propane gas. Therefore, DOE proposes to revise the test pressure conditions in sections 2.3.2.1 and 2.3.2.2 of the DOE clothes dryer test procedure to specify maintaining "the gas supply to the clothes dryer immediately ahead of all controls at a pressure of" 7 to 10 inches of water column for natural gas and 11 to 13 inches of water column for propane gas.

DOE also believes that the specifications for a gas pressure regulator in sections 2.3.2.1 and 2.3.2.2 of its clothes dryer test procedure should clarify that the outlet pressure for a dryer equipped with a pressure regulator for which the manufacturer specifies an outlet pressure, should be approximately that recommended by the manufacturer. DOE is proposing to make these minor revisions to the language in these sections to clarify the outlet pressure conditions for a dryer equipped with a gas pressure regulator.

D. Compliance With Other EPCA Requirements

1. Test Burden

Section 323(b)(3) of EPCA requires that "[a]ny test procedures prescribed or amended under this section shall be reasonably designed to produce test results which measure energy efficiency, energy use * * * or estimated annual operating cost of a covered product during a representative average use cycle or period of use * * * and shall not be unduly burdensome to conduct." (42 U.S.C. 6293(b)(3)) DOE tentatively concluded in the December

2008 TP NOPR that amending the relevant DOE test procedures to incorporate clauses regarding test conditions and methods found in IEC Standard 62301 for measuring standby mode and off mode power consumption, along with the proposed clarifications and text corrections, would satisfy this requirement. 73 FR 74639, 74650 (Dec. 9, 2008)

For clothes dryers, AHAM supported the development of an empirical factor, with appropriate energy units, that might be added to the active energy-use measurements to account for the delay start and cycle finished features, thereby eliminating the need for separate measurements in these modes. AHAM added that, while assumptions would still be involved in development of this type of factor, it would ease the testing requirements and burden. (AHAM, TP No. 10 at p. 5) Whirlpool believes that this proposed regulation would not be burdensome, subject to the changes it suggested for the active, standby, and off mode definitions (as discussed in section III.B.2) and changes to the test procedure (as discussed in sections III.B.3 and III.B.4). (Whirlpool, TP No. 9 at p. 4) For the reasons discussed in section III.B.2, DOE is not proposing amendments to measure delay start and cycle finished modes in the clothes dryer test procedure in today's SNOPR, and is instead proposing simplified methodology in which the energy use associated with delay start and cycle finished modes, although determined to not be energy use in a standby mode, would be approximated by the energy in inactive and off modes. Therefore, DOE tentatively concludes that the proposed amendments to the clothes dryer test procedures for measuring standby and off modes adopted in today's SNOPR are not unduly burdensome.

AHAM commented that DOE's proposed ambient temperature of 74 °F for determining standby power for room air conditioners would substantially increase the test burden, both in terms of time and resources, resulting in higher testing costs. AHAM stated that laboratories would require another facility to run the standby test procedure due to the different ambient conditions. AHAM believes that standby power should be measured at the same temperature conditions used for determining active energy use of room air conditioners. (AHAM, TP No. 10 at p. 5) GE also commented that the smaller tolerances for ambient conditions, which are different from the conditions for cooling performance testing, represent a testing burden. (GE, Public Meeting Transcript, TP No. 8 at pp. 99–100) For the reasons noted in section III.B.3, DOE is proposing to provide manufacturers flexibility in setting the ambient conditions for standby mode and off mode testing. The proposed amendments to the room air conditioner test procedure in today's SNOPR specify maintaining the indoor test conditions at the temperature required by section 4.2 of IEC Standard 62301. Further, if the unit is tested in the cooling performance test chamber, the proposed amendments allow the manufacturer to maintain the outdoor test conditions either as specified for the DOE cooling test procedure or according to section 4.2 of IEC Standard 62301. DOE notes that the indoor temperature range for the cooling performance test falls within the temperature range allowed by IEC Standard 62301 and, along with the flexibility to the outdoor test conditions, would not require another facility to run the standby and off mode tests. In addition, DOE is not proposing amendments to the room air conditioner test procedure that would measure energy use in delay start or off-cycle modes as discussed in section III.B.2. For these reasons, DOE tentatively concludes that the test conditions proposed in today's SNOPR are not unduly burdensome, yet still produce representative standby mode and off mode energy consumption measurements.

The proposed amendments to the DOE test procedure for clothes dryers to test automatic termination control dryers are based upon an international testing standard used to determine compliance with energy conservation standards for clothes dryers in Australia. A number of manufacturers that sell dryers in the United States also sell clothes dryers in Australia, and, therefore, likely already test clothes dryers according to this test standard. DOE believes that the proposed amendments would not require testing methods and equipment that are substantially different from the test methods and equipment in the current DOE test procedures and, therefore, would not require manufacturers to make a major investment in test facilities and new equipment.

The proposed amendments to the DOE test procedure for residential clothes dryers to test vent-less clothes dryers are based on an international test standard used throughout the EU to determine compliance with energy conservation standards. A number of manufacturers that sell dryers in the United States also sell dryers in the EU, and, therefore, likely already test clothes dryers according to this test standard, which is very similar to the amended test procedure proposed in today's SNOPR. DOE believes that the proposed amendments would not require testing methods and equipment that are substantially different from the test methods and equipment in the current DOE clothes dryer test procedure.

DOE's proposed amendments to the clothes dryer test procedure, to reflect current usage patterns and capabilities, do not substantially change the testing procedures and methods such that they would become burdensome to conduct. DOE's proposed amendments to change the number of annual use cycles affects only the calculations of the per-cycle continuously burning pilot light gas energy consumption and the estimated annual operating cost for gas clothes dryers with such pilots. The number of annual use cycles does not impact the testing procedures themselves. The proposed amendments to change the initial RMC from 70 percent to 47 percent are intended to reflect current clothes loads after a wash cycle. DOE believes that such a change would likely only require a moderately longer spin time during test load preparation to achieve the proper lower moisture content, and that it would not be unduly burdensome to conduct. Finally, the proposed amendment to change the test load size for standard-size clothes dryers from 7.00 lb ± .07 lb to 8.45 lb ± .085 lb, respectively, would not impact the testing procedures themselves, and would not require manufacturers to make any significant new investment in test facilities and equipment. DOE believes that these proposed amendments to the DOE clothes dryer test procedure would produce test results that measure energy use of clothes dryers during a representative average use cycle.

The proposed amendments to update the references to external standards in the DOE room air conditioner test procedure are based on the availability of revised standards representing current industry practices and methods. The proposed amendments to reference ANSI/AHAM RAC–1–R2008 do not introduce any new changes in the measurement of cooling capacity or power input, while the proposed amendments to reference ANSI/ASHRAE Standard 16–69 would introduce four new temperature measurements, provide increased test tolerances, and allow additional flexibility in the methodology for measuring capacity. These proposed amendments would not require manufacturers to make any significant new investment in test facilities and equipment, nor require significant changes in the testing methodology.

For the reasons noted above, DOE has tentatively concluded that the amendments to the active mode test procedures would produce representative test results for both residential clothes dryers and room air conditioners, and that testing under the test procedures would not be unduly burdensome to conduct. Therefore, as discussed in section III.C.6, DOE is proposing in today's SNOPR to amend the DOE test procedure to reference the relevant sections of ANSI/AHAM RAC–1–R2008 and ANSI/ASHRAE Standard 16–1983 (RA 2009).[41]

2. Potential Incorporation of IEC Standard 62087

Section 325(gg)(2)(A) of the EISA 2007 amendments to EPCA directs DOE to consider IEC Standard 62087 when amending test procedures to include standby mode and off mode power measurements. (42 U.S.C. 6295(gg)(2)(A)) As discussed in section III.B.1 of this notice, DOE reviewed IEC Standard 62087 "Methods of measurement for the power consumption of audio, video, and related equipment" (Second Edition 2008–09) and determined that it would not be applicable to measuring power consumption of electrical appliances such as clothes dryers and room air conditioners. Therefore, DOE has determined that referencing IEC Standard 62087 is not necessary for the proposed amendments to the test procedures that are the subject of this rulemaking.

3. Integration of Standby Mode and Off Mode Energy Consumption Into the Efficiency Metrics

Section 325(gg)(2)(A) requires that standby mode and off mode energy consumption be "integrated into the overall energy efficiency, energy consumption, or other energy descriptor for each covered product" unless the current test procedures already fully account for the standby mode and off mode energy consumption or if such an integrated test procedure is technically infeasible. (42 U.S.C. 6295(gg)(2)(A)) For clothes dryers, today's SNOPR does not affect DOE's proposal in the December 2008 TP NOPR to incorporate the standby and off mode energy consumption into a "per-cycle combined total energy consumption expressed in kilowatt-hours" and into an CEF, as discussed in section III.B.5 of this notice. For room air conditioners, today's SNOPR does not affect DOE's proposal in the December 2008 TP NOPR to incorporate the standby and off mode energy consumption into a metric for "combined annual energy consumption" and into an CEER, as discussed in section III.B.5.

IV. Effects of Test Procedure Revisions on Compliance With Standards

As noted in section I, DOE must determine to what extent, if any, the proposed test procedures would alter the measured energy efficiency of covered products as determined under the existing test procedures. If DOE determines that an amended test procedure would alter the measured efficiency of a covered product, DOE must amend the applicable energy conservation standard during the rulemaking carried out with respect to such test procedure. (42 U.S.C. 6293(e))

As noted above in section II, EPCA provides that amendments to the test procedures to include standby mode and off mode energy consumption will not determine compliance with previously established standards. (U.S.C. 6295(gg)(2)(C)) Because the proposed amended test procedures for standby mode and off mode energy consumption would not alter existing measures of energy consumption or efficiency, these proposed amendments would not affect a manufacturer's ability to demonstrate compliance with previously established standards.

Based on DOE's review of the proposed amendments to the DOE clothes dryer active mode test procedure in today's SNOPR, DOE believes that only the revisions to the initial RMC, described in section III.C.5.b, and the changes to the standard-size dryer test load sizes, described in section III.C.5.c, would affect the measured EF as compared to the existing test procedure. Based upon DOE testing and analysis of minimally compliant clothes dryers and review of available research, DOE believes that the proposed amendments to the initial RMC would increase the measured EF of minimally compliant clothes dryers by 41 percent, while the proposed amendments to the test load size for standard-size clothes dryers would increase the measured EF by 3.8 percent. Because of the proposed amendments in today's SNOPR, the measured EF of minimally compliant clothes dryers would increase by about 41 percent for compact-size clothes dryers and about 46 percent for standard-size clothes dryers. Table 0.1 shows how the current energy conservation standards would be affected by the proposed amendments to the DOE clothes dryer test procedure. DOE will consider such changes in the concurrent energy conservation standards rulemaking for clothes dryers and room air conditioners.

TABLE 0.1—ENERGY FACTOR OF A MINIMALLY COMPLIANT CLOTHES DRYER WITH THE CURRENT AND PROPOSED AMENDED TEST PROCEDURE

Product class	Energy factor *(lb/kWh)*	
	Current test procedure	Proposed amended test procedure
1. Electric, Standard (4.4 ft^3 or greater capacity)	3.01	4.39
2. Electric, Compact (120 v) (less than 4.4 ft^3 capacity)	3.13	4.41
3. Electric, Compact (240 v) (less than 4.4 ft^3 capacity)	2.90	4.09
4. Gas	2.67	3.90

Because the proposed clothes dryer test procedure amendments for active mode would substantially change the existing EF metric, DOE has tentatively decided to create a new appendix D1 in 10 CFR 430 subpart B for informational purposes only. Such an appendix would contain a clothes dryer test procedure that manufacturers would be required to use on the mandatory compliance date of amended clothes dryer energy conservation standards. The final rule for the clothes dryer energy conservation standards rulemaking is due to be delivered to the **Federal Register** on June 30, 2011, and will have a compliance date 3 years later. Manufacturers must continue to use

[41] The DOE test procedure amendments reference ANSI/AHAM RAC–1–R2008 sections 4, 5, 6.1, and 6.5, and state that these provisions should be conducted in accordance with ANSI/ASHRAE Standard 16–1983 (RA 2009).

appendix D to subpart B of part 430 for clothes dryers until the energy conservation standards at 10 CFR 430.32(h) are amended to require mandatory compliance using appendix D1.

Because DOE's review of the proposed room air conditioner test procedure amendments tentatively concluded that the measured EER would not be affected, manufacturers must continue to use appendix F to measure room air conditioner active mode energy use. Manufacturers would not be required to use the proposed provisions for standby mode and off mode energy use (specifically, sections 2.2, 3.2, 4.2, and 5.3) until the mandatory compliance date of amended room air conditioner energy conservation standards.

All representations related to standby mode and off mode energy consumption of both clothes dryers and room air conditioners made 180 days after the date of publication of the test procedures final rule in the **Federal Register** and before the compliance date of amended energy conservation standards must be based upon the standby mode and off mode requirements of the amended test procedures (for clothes dryers, appendix D1 and for room air conditioners, amended appendix F.)

V. Procedural Requirements

A. Review Under Executive Order 12866

Today's proposed regulatory action is not a "significant regulatory action" 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 Office of Management and Budget (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 for any rule that by law must be proposed for public comment, unless the agency certifies that the proposed 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, to ensure that the potential impacts of its rules on small entities are properly considered during the rulemaking process. 68 FR 7990. DOE's procedures and policies may be viewed on the Office of the General Counsel's Web site (*http://www.gc.doe.gov*).

DOE reviewed today's SNOPR under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. This SNOPR prescribes amendments to test procedures that would be used to test compliance with energy conservation standards for the products that are the subject of this rulemaking; these amendments are described in detail elsewhere in the preamble. DOE tentatively certifies that this SNOPR would not have a significant impact on a substantial number of small entities. The factual basis for this certification is as follows.

The Small Business Administration (SBA) considers an entity to be a small business if, together with its affiliates, it employs less than a threshold number of workers specified in 13 CFR part 121. The thresholds set forth in these regulations are based on size standards and codes established by the North American Industry Classification System (NAICS).[42] The threshold number for NAICS classification for 335224, which applies to household laundry equipment manufacturers and includes clothes dryer manufacturers, is 1,000 employees. Additionally, the threshold number for NAICS classification for 335224, which applies to air conditioning and warm air heating equipment and commercial and industrial refrigeration equipment, is 750 employees.

Most of the manufacturers supplying clothes dryers and room air conditioners are large multinational corporations. As part of the energy conservation standards rulemaking for residential clothes dryers and room air conditioners, DOE requested comment on whether there are any manufacturer subgroups, including potential small businesses, that it should consider for its analyses. However, DOE did not receive any comments regarding whether there are any residential clothes dryer or room air conditioner manufacturers that would be considered small businesses. Searches of the SBA Web site [43] to identify manufacturers within NAICS code 335224 that produce clothes dryers revealed only one potential small business that could be affected by these proposed test procedure amendments. DOE also investigated manufacturers registered as small businesses under NAICS codes 333415 for room air conditioners, and only one small business was identified that could be affected by these proposed test procedure amendments, out of approximately 10 manufacturers supplying room air conditioners in the United States.

The amendments set forth in today's SNOPR for standby and off mode energy use to adopt definitions of modes based on the relevant provisions from IEC Standard 62301 CDV do not impose additional impacts beyond those discussed in the December 2008 TP NOPR to amend DOE's test procedures by incorporating testing provisions to address standby mode and off mode energy consumption. DOE tentatively concluded in the December 2008 TP NOPR that the proposed measures would not have a significant impact on either small or large manufacturers under the provisions of the Regulatory Flexibility Act for the reasons set forth below.

The tests to measure standby and off mode can be conducted in the same facilities used for the current energy testing of these products, so there would be no additional facilities costs required by the proposed rule. The power meter required for these tests might require greater accuracy than the power meter used for current energy testing, but the investment required for a possible instrumentation upgrade would likely be relatively modest—on the order of two thousand dollars per power meter—for small manufacturers with lower market share that may require as few as one power meter because they have fewer units to test. This cost is small compared to the overall financial investment needed to undertake the business enterprise of testing consumer products which involves facilities, qualified staff, and specialized equipment.

The duration of the standby and off mode testing is not expected to exceed the time required to conduct current energy testing. The proposed standby and off mode test could begin immediately following the active mode efficiency test and therefore, would not require additional set up, instrumentation, or waiting period. The testing official could run simultaneous tests on other units and simply record the results of the test at the end of the standby period. For these reasons, DOE believes that these requirements for equipment and time to conduct the additional tests would not be expected to impose a significant economic impact on affected small businesses.

Accordingly, DOE stated that it did not believe that the proposed rule

[42] For more information visit: *http://www.sba.gov/.*

[43] A searchable database of certified small businesses is available online at: *http://dsbs.sba.gov/dsbs/search/dsp_dsbs.cfm.*

would have a significant economic impact on entities subject to the applicable testing requirements. 73 FR 74639, 74651–52 (Dec. 9, 2008). DOE received no comments on this issue. Because DOE believes that the proposed amendments to address standby mode and off mode energy consumption in today's SNOPR would not impose additional impacts beyond those that would be imposed by the amendments proposed in the December 2008 TP NOPR, DOE believes that the amendments in today's SNOPR regarding standby mode and off mode would not have a significant economic impact on the small entities subject to the applicable testing requirements.

The proposed rule in today's SNOPR would also amend DOE's active mode test procedures for clothes dryers and room air conditioners by: (1) Providing a clothes dryer testing procedure to properly account for automatic cycle termination; (2) providing a clothes dryer testing procedure for vent-less clothes dryers; (3) revising the clothes dryer and room air conditioner test procedures to reflect current usage patterns and capabilities; and (4) incorporating references to current external test standards for room air conditioners and clothes dryers. These proposed amendments to the test procedures can be conducted in the same facilities used for the current energy testing of these products, and because all manufacturers of vent-less clothes dryers which DOE identified also produce vented clothes dryers, no new investments would be required for the proposed addition of vent-less clothes dryers as covered products. In addition, the test time and equipment required for the proposed testing of automatic cycle termination are comparable to those for the existing clothes dryer test procedure. Further, the proposed adjustments to load size and initial RMC would require relatively minor changes in test materials and extraction time, respectively, and other proposed amendments to reflect current usage patterns and capabilities are reflected in changes to the calculations, which do not have a time impact. The proposed amendments to reference the current external clothes dryer test standard would reference the same procedures and equipment as the test standard referenced by the existing DOE clothes dryer test procedure. Finally, DOE recognizes that the proposed amendments to reference the current external room air conditioner test standards would add requirements for additional calibration of test instruments (at least once every six months). DOE estimates that such calibration would cost on the order of 1,000 to 1,500 dollars per year. Thus, such requirements for equipment and time to conduct the additional tests would not be expected to impose a significant economic impact. Accordingly, DOE does not believe that the proposed rule would have a significant economic impact on entities subject to the applicable testing requirements.

For these reasons, DOE tentatively concludes and certifies that today's SNOPR would not have a significant economic impact on a substantial number of small entities. Accordingly, DOE has not prepared a regulatory flexibility analysis for this rulemaking. DOE will transmit the 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

This rule contains a collection-of-information requirement subject to the Paperwork Reduction Act (PRA) which has been approved by OMB under control number 1910–1400. Public reporting burden for compliance reporting for energy conservation standards is estimated to average 30 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. Send comments regarding this burden estimate, or any other aspect of this data collection, including suggestions for reducing the burden, to DOE (*see* **ADDRESSES**) and by e-mail to *Christine_J._Kymn@omb.eop.gov.*

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

D. Review Under the National Environmental Policy Act of 1969

In this notice, DOE is proposing test procedure amendments that it expects would be used to develop and implement future energy conservation standards for clothes dryers and room air conditioners. 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 (42 U.S.C. 4321 *et seq.*) and DOE's implementing regulations at 10 CFR part 1021. Specifically, this rule amends an existing rule without changing its environmental effect, and, therefore, is covered by the Categorical Exclusion in 10 CFR part 1021, subpart D, paragraph A5, which applies because this rule would establish revisions to existing test procedures that would not affect the amount, quality, or distribution of energy usage, and, therefore, would 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," imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. 64 FR 43255 (Aug. 10, 1999). 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 that it will follow in developing such regulations. 65 FR 13735. DOE examined this proposed rule and determined that it would not preempt State law and would 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 subject of today's proposed rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) Therefore, Executive Order 13132 requires no further action.

F. Review Under Executive Order 12988

Regarding 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 to ensure that the regulation specifies the following: (1) The preemptive effect, if any; (2) any effect on existing Federal law or regulation; (3) a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) the retroactive effect, if any; (5) definitions of key terms; and (6) other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or whether it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, this 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; 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 a proposed regulatory action likely to result in a rule that may cause the expenditure 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 such governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820. (The 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 an 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 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 not necessary 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 18, 1988), that this proposed regulation 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. OMB's guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). DOE has reviewed today's notice under 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 a Statement of Energy Effects for any proposed significant energy action. A "significant energy action" is defined as any action by an agency that promulgates 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 if the proposal is implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use. Today's proposed regulatory action is not a significant regulatory action under Executive Order 12866. It has likewise not been designated as a significant energy action by the Administrator of OIRA. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy. Therefore, it is not a significant energy action, and, 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 DOE Organization Act (Pub. L. 95–91; 42 U.S.C. 7101 *et seq.*), DOE must comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977 (FEAA). (15 U.S.C. 788) Section 32 essentially provides in part that, where a proposed rule authorizes or requires use of commercial standards, the 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 Federal Trade Commission (FTC) concerning the impact of the commercial or industry standards on competition.

The proposed modifications to the test procedures addressed by this proposed action incorporate testing methods contained in the commercial standard, IEC Standard 62301. Specifically DOE is proposing to incorporate from section 4, ("General conditions for measurements"), paragraph 4.2, "Test room," paragraph 4.3, "Power supply." paragraph 4.4, "Supply voltage waveform," and paragraph 4.5, "Power measurement accuracy," and from section 5 ("Measurements"), paragraph 5.1, "General" and paragraph 5.3, "Procedure" of IEC Standard 62301. DOE has evaluated this standard and is unable to conclude whether it fully complies with the requirements of section 32(b) of the FEAA (*i.e.,* whether it was developed in a manner that fully provides for public participation, comment, and review.) DOE will consult with the Attorney General and

the Chairman of the FTC about the impact on competition of using the methods contained in this standard, before prescribing a final rule.

VI. Public Participation

A. Attendance at the Public Meeting

The time, date, and location of the public meeting are listed in the **DATES** and **ADDRESSES** sections at the beginning of this SNOPR. To attend the public meeting, please notify Ms. Brenda Edwards at (202) 586–2945. As explained in the **ADDRESSES** section, foreign nationals visiting DOE Headquarters are subject to advance security screening procedures.

B. Procedure for Submitting Requests to Speak

Any person who has an interest in today's notice, or who is a representative of a group or class of persons that has an interest in these issues, may request an opportunity to make an oral presentation at the public meeting. Such persons may hand-deliver requests to speak to the address shown in the **ADDRESSES** section at the beginning of this notice between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Requests may also be sent by mail or e-mail to: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121, or *Brenda.Edwards@ee.doe.gov.* Persons who wish to speak should include in their request a computer diskette or CD in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format that briefly describes the nature of their interest in this rulemaking and the topics they wish to discuss. Such persons should also provide a daytime telephone number where they can be reached.

DOE requests persons scheduled to make an oral presentation to submit an advance copy of their statements at least one week before the public meeting. DOE may permit persons who cannot supply an advance copy of their statement to participate, if those persons have made advance alternative arrangements with the Building Technologies Program. Requests to give an oral presentation should ask for such alternative arrangements.

C. Conduct of Public Meeting

DOE will designate a DOE official to preside at the public meeting and may use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with section 336 of EPCA (42 U.S.C. 6306). A court reporter will be present to record the proceedings and prepare a transcript. DOE reserves the right to schedule the order of presentations and to establish the procedures governing the conduct of the public meeting. After the public meeting, interested parties may submit further comments on the proceedings as well as on any aspect of the rulemaking until the end of the comment period.

The public meeting will be conducted in an informal, conference style. DOE will present summaries of comments received before the public meeting, allow time for presentations by participants, and encourage all interested parties to share their views on issues affecting this rulemaking. Each participant will be allowed to make a prepared general statement (within time limits determined by DOE), before the discussion of specific topics. DOE will permit other participants to comment briefly on any general statements. At the end of all prepared statements on each specific topic, DOE will permit participants to clarify their statements briefly and to comment on statements made by others.

Participants should be prepared to answer DOE's and other participants' questions. DOE representatives may also ask participants about other matters relevant to this rulemaking. The official conducting the public meeting will accept additional comments or questions from those attending, as time permits. The presiding official will announce any further procedural rules or modification of the above procedures that may be needed for the proper conduct of the public meeting.

DOE will make the entire record of this proposed rulemaking, including the transcript from the public meeting, available for inspection at the U.S. Department of Energy, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, (202) 586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Copies of the transcript are available for purchase from the transcribing reporter.

D. Submission of Comments

DOE will accept comments, data, and information regarding the proposed rule before or after the public meeting, but no later than the date provided at the beginning of this notice. Comments, data, and information submitted to DOE's e-mail address for this rulemaking should be provided in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format. Interested parties should avoid the use of special characters or any form of encryption, and wherever possible, comments should include the electronic signature of the author. Comments, data, and information submitted to DOE via mail or hand delivery/courier should include one signed original paper copy. No telefacsimiles (faxes) will be accepted.

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 two copies: One copy of the document that includes all of the information believed to be confidential, and one copy of the document with that information deleted. DOE will determine the confidential status of the information and treat it accordingly.

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 was previously made available to others without obligation concerning its confidentiality; (5) an explanation of the competitive injury to the submitting person that 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.

E. Issues on Which DOE Seeks Comment

DOE is particularly interested in receiving comments and views of interested parties on the following issues:

1. *Incorporation of IEC Standard 62301.* DOE invites comment on the adequacy of IEC Standard 62301 to measure standby power for clothes dryers and room air conditioners in general, and on the suitability of incorporating into DOE regulations the following specific provisions from IEC Standard 62301: Section 4 ("General conditions for measurements"), paragraph 4.2, "Test room,", paragraph 4.3 "Power supply" (for room air conditioners only), paragraph 4.4, "Supply voltage waveform," and paragraph 4.5, "Power measurement accuracy," and section 5 ("Measurements"), paragraph 5.1, "General" and paragraph 5.3, "Procedure." (*See* section III.B.1.)

2. "*Standby mode*" *definitions.* DOE invites comment on the proposed definition of "standby mode," which is based on the definition provided in IEC Standard 62301 CDV. (*See* section III.B.2.)

3. *Clothes dryer standby modes.* DOE invites comment on the establishment of inactive mode as the only standby mode for clothes dryers and the determination that delay start mode and cycle finished mode would not be considered standby modes. DOE further invites comment on the

proposed mode definitions and on the question of whether there are any modes consistent with the "active mode," "standby mode," or "off mode" definitions under the proposed definitions that have not been identified and that can represent significant energy use. (*See* section III.B.2.)

4. *Room air conditioner standby modes.* DOE invites comment on the establishment of inactive mode as the only standby mode for room air conditioners and the determination that delay start mode and off-cycle mode would not be considered standby modes. DOE further invites comment on the proposed mode definitions and on the question of whether there are any modes consistent with the "active mode," "standby mode," or "off mode" definitions under the proposed definitions that have not been identified and that can represent significant energy use. (*See* section III.B.2.)

5. *Network mode.* DOE welcomes comment on whether clothes dryers and room air conditioners are currently available that incorporate a networking function and whether definitions and testing procedures for a network mode should be incorporated into the DOE test procedure. DOE also requests comment on appropriate methodologies for measuring energy consumption in a network mode, and data on the results and repeatability of such testing methodology. (*See* section III.B.2.)

6. *Test room conditions.* DOE requests comment on the proposed room ambient temperature range for standby mode and off mode power measurements for room air conditioners and clothes dryers. (*See* section III.B.3.)

7. *Energy-use calculation for standby mode and off mode for clothes dryers.* DOE invites comment on the approach for determining total energy use for standby mode and off mode for clothes dryers, including its accuracy and test burden. DOE also invites comment and requests data on the estimates for annual hours associated with each mode, including the 140 hours specified by the current test procedure for active mode (drying). (*See* section III.B.4.a.)

8. *Energy-use calculation for standby mode and off mode for room air conditioners.* DOE invites comment on the approach for determining total energy use for standby mode and off mode for room air conditioners, including its accuracy and test burden. DOE also invites comment and requests data on the estimates for annual hours associated with each mode, including the estimate of "unplugged" time. (*See* section III.B.4.b.)

9. *Clothes dryer testing procedures to account for automatic cycle termination.* DOE invites comment on the adequacy of AS/NZS Standard 2442, along with proposed definitions and clarifications, to measure energy consumption for timer and automatic termination control clothes dryers to account for over-drying energy consumption. DOE further invites comments on whether the proposed FU factor credits for timer and automatic termination control dryers, along with the revised calculations for per-cycle energy consumption, are appropriate. In addition, DOE welcomes comment on whether a final RMC of 5 percent is appropriate, and, if not, what a representative final RMC would be. DOE also welcomes data from dryers tested according to the proposed test procedure, in particular for units which minimally comply with current energy conservation standards, as well as data showing whether one sensor technology is more accurate, and reduces over-drying, than another. (*See* section III.C.2.)

10. *Water temperature for clothes dryer test load preparation.* DOE invites comment on whether the existing water temperature of 100° ± 5 °F for test load preparation in the existing test procedure is representative of consumer usage habits, and, if not, what would be a representative value. DOE also requests data quantifying how changes to the water temperature for clothes dryer test load preparation would affect the measured efficiency as compared to the existing DOE test procedure, in particular for those units that are minimally compliant with current energy conservation standards.

11. *Cycles and settings for timer dryer and automatic termination control dryer testing.* DOE invites comment on whether using the maximum temperature setting for timer dryers is representative of current consumer usage habits. DOE also invites comment on whether the proposed cycles and settings for the automatic termination control dryer tests are representative of current consumer usage habits. DOE requests comment on whether multiple cycles and settings should be tested and how the results from those multiple tests should be evaluated, and if so, how testing multiple cycles and settings would affect the measured efficiency as compared to the existing DOE clothes dryer test procedure. (*See* section III.C.2.)

12. *Cool-down period for automatic termination control dryer testing.* DOE welcomes comment on whether the cool-down period should be included as part of the active mode test cycle for automatic termination control dryers. In addition, DOE also welcomes data quantifying how including the cool-down period in the test cycle would affect the measured efficiency of clothes dryers as compared to the existing DOE test procedure, in particular for those units that are minimally compliant with current energy conservation standards. (*See* section III.C.2.)

13. *Incorporation of testing procedures for vent-less clothes dryers.* DOE invites comment on the adequacy of proposed definitions and installation conditions for vent-less clothes dryers, which are based upon the alternate test procedure adopted in the LG Petition for Waiver. DOE further invites comment on the proposed additional clarifications to the installation conditions, condensation boxes, dryer preconditioning, and testing conditions based on EN Standard 61121 and Whirlpool's proposed amendments. Finally, DOE requests comment and data on the water consumption of vent-less clothes dryers and if measurement of water consumption should be included in the DOE clothes dryer test procedure. (*See* section III.C.3.)

14. *Number of valid clothes dryer test cycles.* DOE invites comment and data suggesting that test-to-test variation is sufficient to warrant a requirement for more than one clothes dryer test cycle. (*See* section III.C.3)

15. *Detergent specifications for test cloth preconditioning.* DOE invites comment on the proposed revisions to the detergent formulation and dosage specifications, requiring 60.8 g of AHAM standard test detergent Formula 3 for clothes dryer test cloth preconditioning. DOE also welcomes data showing the effects of changing the detergent specifications for test cloth preconditioning on the measured EF for clothes dryers. (*See* section III.C.4)

16. *Clothes dryer number of annual use cycles.* DOE seeks comment on the proposed amendment to change the number of clothes dryer annual use cycles to 283 cycles for all product classes of clothes dryers based upon data from the 2005 RECS. (*See* section III.C.5.a.)

17. *Clothes dryer initial remaining moisture content.* DOE seeks comment on the proposed amendments to the DOE clothes dryer test procedure to change the initial RMC to 47 percent ± 3.5 percent to reflect current consumer usage habits, based on the trends of the shipment-weighted average RMC of clothes washers shown in data submitted by AHAM. DOE further welcomes comment and data indicating an appropriate initial RMC and how that initial RMC would affect the measured EF of clothes dryers, in particular units that are minimally compliant with current energy conservation standards. (*See* section III.C.5.b.)

18. *Clothes Dryer Test Load Weight.* DOE seeks comment on the proposed amendments to the DOE clothes dryer test procedure to change the clothes dryer test load size to 8.45 lb ± .085 lb for standard-size dryers. DOE also welcomes data on clothes washer and clothes dryer test load sizes representative of current consumer usage habits for both compact-size and standard-size units. DOE further requests data on how any changes in test load size would affect the measured EF of clothes dryers, in particular units that are minimally compliant with current energy conservation standards. (*See* section III.C.5.c.)

19. *Room air conditioner annual operating hours.* DOE seeks comment on the determination that the 750 annual operating hours specified by the current DOE test procedure for room air conditioners is still representative based upon data from the 2005 RECS. (*See* section III.C.5.d.)

20. *Room air conditioner ambient test conditions.* DOE invites comment and data indicating representative ambient test conditions for the DOE room air conditioner test procedure. DOE further requests data showing how any changes to the ambient conditions would affect the measured EER of room air conditioners, in particular units that are minimally compliant with current energy conservation standards. (*See* section III.C.5.f.)

21. *Room air conditioner referenced test procedures.* DOE invites comment on the proposed amendments to update the references in the DOE room air conditioner test procedure to reference the latest ANSI and ASHRAE test standards, ANSI/AHAM RAC–1–R2008 and ANSI/ASHRAE Standard 16–1983 (RA 2009). (*See* section III.C.6.)

22. *Clothes dryer referenced test procedure.* DOE invites comment on the proposed amendments to update the reference in the DOE clothes dryer test procedure to reference

the latest AHAM clothes dryer test standard, AHAM Standard HLD–1–2009, and to eliminate the reference to obsolete AHAM Standard HLD–2EC. DOE also invites comment on whether the optional modified exhaust simulator in AHAM Standard HLD–1–2009 is appropriate for incorporation into the DOE clothes dryer test procedure. DOE seeks data comparing the effects of the two exhaust simulators in AHAM Standard HLD–1–2009 on the measured EF, in particular for units that minimally comply with current energy conservation standards. (*See* section III.C.7.)

23. *Technical correction for the per-cycle gas dryer continuously burning pilot light gas energy consumption.* DOE seeks comment on its proposed correction to the calculation of the per-cycle gas dryer continuously burning pilot light gas energy consumption. (*See* section III.C.8.)

24. *Clarification of gas supply test conditions for gas clothes dryers.* DOE seeks comment on its proposed clarifying language for specifying the natural gas and propane supply pressure conditions for testing gas clothes dryers.

25. *Effects of test procedure revisions on compliance with energy conservation standards.* DOE invites comment on how the proposed amendments to the DOE test procedures for clothes dryers and room air conditioners will affect the measured efficiency of products. In particular, DOE seeks data showing how certain proposed amendments affect the EF or EER of minimally compliant clothes dryers or room air conditioners, respectively. (*See* section IV.)

VII. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this notice of proposed rulemaking.

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Imports, Incorporation by reference, Intergovernmental relations, Small businesses.

Issued in Washington, DC, on June 11, 2010.

Cathy Zoi,

Assistant Secretary, Energy Efficiency and Renewable Energy.

For the reasons stated in the preamble, DOE proposes to amend part 430 of chapter II 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.

2. Section 430.3 is amended by:

a. Redesignating paragraphs (e)(1) through (e)(9) as (e)(2) through (e)(10).

b. Adding a new paragraph (e)(1).

c. Adding a new paragraph (g)(2).

d. Adding a new paragraph (g)(3).

e. Adding a new paragraph (l)(3).

The additions read as follows:

§ 430.3 Materials incorporated by reference.

* * * * *

(e) * * *

(1) ANSI/ASHRAE 16–1983 (“ANSI/ASHRAE 16”) (Reaffirmed 2009), Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners, approved December 1, 1983, IBR approved for Appendix F to Subpart B.

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(g) * * *

(2) AHAM HLD–1–2009 (“AHAM HLD–1”), Household Tumble Type Clothes Dryers, approved October 2, 2009, IBR approved for Appendix D1 to Subpart B.

(3) ANSI/AHAM RAC–1–R2008 (“ANSI/AHAM RAC–1”), Room Air Conditioners, ANSI approved July 7, 2008, IBR approved for Appendix F to Subpart B.

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(l) * * *

(3) IEC 62301–2005–06 (“IEC 62301”), Household electrical appliances—Measurement of standby power (First Edition 2005–06), approved June 13, 2005, IBR approved for Appendix D1 and Appendix F to Subpart B.

* * * * *

3. Section 430.23 is amended by revising paragraphs (d) and (f) to read as follows:

§ 430.23 Test procedures for the measurement of energy and water consumption.

* * * * *

(d) *Clothes dryers.* (1) The estimated annual operating cost for clothes dryers shall be–

(i) For an electric clothes dryer, the product of the following three factors:

(A) The representative average-use cycle of 283 cycles per year,

(B) The total per-cycle electric dryer energy consumption in kilowatt-hours per-cycle, determined according to 4.1 of appendix D to this subpart before the date that appendix D1 becomes mandatory and 4.2 of appendix D1 upon the date that appendix D1 to this subpart becomes mandatory (see the note at the beginning of appendix D1), and

(C) The representative average unit cost in dollars per kilowatt-hour as provided by the Secretary, the resulting product then being rounded off to the nearest dollar per year, and

(ii) For a gas clothes dryer, the product of the representative average-use cycle of 283 cycles per year times the sum of:

(A) The product of the per-cycle gas dryer electric energy consumption in kilowatt-hours per cycle, determined according to 4.2 of appendix D to this subpart before the date that appendix D1 becomes mandatory and 4.4 of appendix D1 upon the date that appendix D1 to this subpart becomes mandatory, times the representative average unit cost in dollars per kilowatt-hour as provided by the Secretary plus,

(B) The product of the total gas dryer gas energy consumption per cycle, in Btu’s per cycle, determined according to 4.5 of appendix D of this subpart before the date that appendix D1 becomes mandatory and 4.8 of appendix D1 upon the date that appendix D1 to this subpart becomes mandatory, times the representative average unit cost in dollars per Btu as provided by the Secretary, the resulting product then being rounded off to the nearest dollar per year.

(2) The energy factor, expressed in pounds of clothes per kilowatt-hour, for clothes dryers shall be either the quotient of a 3-pound bone-dry test load for compact dryers, as defined by 2.7.1 of appendix D to this subpart before the date that appendix D1 becomes mandatory or by 2.7.1 of appendix D1 upon the date that appendix D1 to this subpart becomes mandatory, or the quotient of a 7-pound bone-dry test load for standard dryers, as defined by 2.7.2 of appendix D to this subpart before the date that appendix D1 becomes mandatory or an 8.45-pound bone-dry test load for standard dryers, as defined by 2.7.2 of appendix D1 upon the date that appendix D1 to this subpart becomes mandatory, as applicable, divided by the clothes dryer energy consumption per cycle, as determined according to 4.1 for electric clothes dryers and 4.6 for gas clothes dryers of appendix D to this subpart before the date that appendix D1 becomes mandatory and 4.2 for electric clothes dryers and 4.9 for gas clothes dryers of appendix D1 upon the date that appendix D1 to this subpart becomes mandatory, the resulting quotient then being rounded off to the nearest hundredth (.01).

(3) The combined energy factor, expressed in pounds of clothes per kilowatt-hour, for clothes dryers shall be either the quotient of a 3-pound bone-dry test load for compact dryers, as defined by 2.7.1 of appendix D1 to this subpart, or the quotient of a 8.45-pound

bone-dry test load for standard dryers, as defined by 2.7.2 of appendix D1 to this subpart, as applicable, divided by the clothes dryer combined energy consumption per cycle, as determined according to 4.11 of appendix D1 to this subpart, the resulting quotient then being rounded off to the nearest hundredth (.01).

(4) Other useful measures of energy consumption for clothes dryers shall be those measures of energy consumption for clothes dryers which the Secretary determines are likely to assist consumers in making purchasing decisions and which are derived from the application of appendix D to this subpart before the date that appendix D1 becomes mandatory and appendix D1 upon the date that appendix D1 to this subpart becomes mandatory.

* * * * *

(f) *Room air conditioners.* (1) The estimated annual operating cost for room air conditioners, expressed in dollars per year, shall be determined by multiplying the following three factors:

(i) Electrical input power in kilowatts as determined in accordance with 5.2 of appendix F to this subpart,

(ii) The representative average-use cycle of 750 hours of compressor operation per year, and

(iii) A representative average unit cost of electrical energy in dollars per kilowatt-hour as provided by the Secretary, the resulting product then being rounded off to the nearest dollar per year.

(2) The energy efficiency ratio for room air conditioners, expressed in Btu's per watt-hour, shall be the quotient of:

(i) The cooling capacity in Btu's per hour as determined in accordance with 5.1 of appendix F to this subpart divided by:

(ii) The electrical input power in watts as determined in accordance with 5.2 of appendix F to this subpart, the resulting quotient then being rounded off to the nearest 0.1 Btu per watt-hour.

(3) The average annual energy consumption for room air conditioners, expressed in kilowatt-hours per year, shall be determined by multiplying together the following two factors:

(i) Electrical input power in kilowatts as determined in accordance with 5.2 of appendix F to this subpart, and

(ii) The representative average-use cycle of 750 hours of compressor operation per year, the resulting product then being rounded off to the nearest kilowatt-hour per year.

(4) The combined annual energy consumption for room air conditioners, expressed in kilowatt-hours per year, shall be the sum of:

(i) The average annual energy consumption as determined in accordance with paragraph (f)(3) of this section, and

(ii) The standby mode and off mode energy consumption, as determined in accordance with 5.3 of appendix F to this subpart, the resulting sum then being rounded off to the nearest kilowatt-hour per year.

(5) The combined energy efficiency ratio for room air conditioners, expressed in Btu's per watt-hour, shall be the quotient of:

(i) The cooling capacity in Btu's per hour as determined in accordance with 5.1 of appendix F to this subpart multiplied by the representative average-use cycle of 750 hours of compressor operation per year, divided by

(ii) The combined annual energy consumption as determined in accordance with section (4) multiplied by a conversion factor of 1,000 to convert kilowatt-hours to watt-hours, the resulting quotient then being rounded off to the nearest 0.1 Btu per watt-hour.

* * * * *

4. Appendix D to subpart B of part 430 is amended by adding a Note after the heading to read as follows:

Appendix D to Subpart B of Part 430–Uniform Test Method for Measuring the Energy Consumption of Clothes Dryers

Note: Manufacturers must continue to use appendix D to subpart B of part 430 until the energy conservation standards for clothes dryers at 10 CFR 430.32(h) are amended to require mandatory compliance using appendix D1.

* * * * *

5. Appendix D1 is added to subpart B of part 430 to read as follows:

Appendix D1 to Subpart B of Part 430–Uniform Test Method for Measuring the Energy Consumption of Clothes Dryers

Note: Appendix D1 to subpart B of part 430 is informational only. Manufacturers must continue to use appendix D to subpart B of part 430 until the energy conservation standards for clothes dryers at 10 CFR 430.32(h) are amended to require mandatory compliance using appendix D1.

1. Definitions

1.1 "Active mode" means a mode in which the clothes dryer is connected to a main power source, has been activated and is performing the main function of tumbling the clothing with or without heated or unheated forced air circulation to remove moisture from and/or remove or prevent wrinkling of the clothing.

1.2 "AHAM" means the Association of Home Appliance Manufacturers.

1.3 "Automatic termination control" means a dryer control system with a sensor which monitors either the dryer load temperature or its moisture content and with a controller which automatically terminates the drying process. A mark or detent which indicates a preferred automatic termination control setting must be present if the dryer is to be classified as having an "automatic termination control." A mark is a visible single control setting on one or more dryer controls.

1.4 "*Automatic termination control dryer*" means a clothes dryer which can be preset to carry out at least one sequence of operations to be terminated by means of a system assessing, directly or indirectly, the moisture content of the load. An automatic termination control dryer with supplementary timer shall be tested as an automatic termination control dryer.

1.5 "*Bone dry*" means a condition of a load of test clothes which has been dried in a dryer at maximum temperature for a minimum of 10 minutes, removed, and weighed before cool down, and then dried again for 10-minute periods until the final weight change of the load is 1 percent or less.

1.6 "*Compact*" or "compact size" means a clothes dryer with a drum capacity of less than 4.4 cubic feet.

1.7 "*Conventional clothes dryer*" means a clothes dryer that exhausts the evaporated moisture from the cabinet.

1.8 "*Cool down*" means that portion of the clothes drying cycle when the added gas or electric heat is terminated and the clothes continue to tumble and dry within the drum.

1.9 "*Cycle*" means a sequence of operation of a clothes dryer which performs a clothes drying operation, and may include variations or combinations of the functions of heating, tumbling and drying.

1.10 "*Drum capacity*" means the volume of the drying drum in cubic feet.

1.11 "*HLD–1*" means the test standard published by the Association of Home Appliance Manufacturers, titled "Household Tumble Type Clothes Dryers", October 2009, AHAM HLD–1–2009 (incorporated by reference; *see* § 430.3).

1.12 "*IEC 62301*" means the test standard published by the International Electrotechnical Commission, titled "Household electrical appliances–Measurement of standby power," Publication 62301 (First Edition, 2005–06), IEC 62301–2005–06 (incorporated by reference; *see* § 430.3).

1.13 "*Inactive mode*" means a standby mode that facilitates the activation of active mode by remote switch (including remote control), internal sensor, or timer, or that provides continuous status display.

1.14 "*Moisture content*" means the ratio of the weight of water contained by the test load to the bone-dry weight of the test load, expressed as a percent.

1.15 "*Moisture sensing control*" means a system which utilizes a moisture sensing element within the dryer drum that monitors the amount of moisture in the clothes and automatically terminates the dryer cycle.

1.16 "*Off mode*" means a mode in which the clothes dryer is connected to a main power source and is not providing any active

or standby mode function, and where the mode may persist for an indefinite time. An indicator that only shows the user that the product is in the off position is included within the clasification of an off mode.

1.17 "*Standard size*" means a clothes dryer with a drum capacity of 4.4 cubic feet or greater.

1.18 "*Standby mode*" means any product modes where the energy using product is connected to a mains power source and offers one or more of the following user oriented or protective functions which may persist for an indefinite time:

(a) To facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer.

(b) Continuous functions, including information or status displays (including clocks) or sensor-based functions. A timer is a continuous clock function (which may or may not be associated with a display) that provides regular scheduled tasks (e.g., switching) and that operates on a continuous basis.

1.19 "*Temperature sensing control*" means a system which monitors dryer exhaust air temperature and automatically terminates the dryer cycle.

1.20 "*Timer dryer*" means a clothes dryer that can be preset to carry out at least one sequence of operations to be terminated by a timer, but may also be manually controlled.

1.21 "*Vent-less clothes dryer*" means a clothes dryer that uses a closed-loop system with an internal condenser to remove the evaporated moisture from the heated air. The moist air is not discharged from the cabinet.

2. Testing Conditions

2.1 *Installation.* Install the clothes dryer in accordance with manufacturer's instructions. For conventional clothes dryers, as defined in 1.7, the dryer exhaust shall be restricted by adding the AHAM exhaust simulator described in 3.3.5.1 of HLD–1 (incorporated by reference; *see* § 430.3). For vent-less clothes dryers, as defined in 1.21, the dryer shall be tested without the AHAM exhaust simulator. Where the manufacturer gives the option to use the dryer both with and without a duct, the dryer shall be tested without the exhaust simulator. All external joints should be taped to avoid air leakage. If the manufacturer gives the option to use a vent-less clothes dryer, as defined in 1.21, with or without a condensation box, the dryer shall be tested with the condensation box installed. For vent-less clothes dryers, the condenser unit of dryer must remain in place and not be taken out of the dryer for any reason between tests. For drying testing, disconnect all console lights or other lighting systems on the clothes dryer which do not consume more than 10 watts during the clothes dryer test cycle. For standby and off mode testing, do not disconnect console lights or other lighting systems.

2.2 *Ambient temperature and humidity.*

2.2.1 For drying testing, maintain the room ambient air temperature at 75 ± 3 °F and the room relative humidity at 50 ± 10 percent relative humidity.

2.2.2 For standby and off mode testing, maintain room ambient air temperature conditions as specified in section 4, paragraph 4.2 of IEC 62301 (incorporated by reference; *see* § 430.3).

2.3 *Energy supply.*

2.3.1 *Electrical supply.* Maintain the electrical supply at the clothes dryer terminal block within 1 percent of 120/240 or 120/208Y or 120 volts as applicable to the particular terminal block wiring system and within 1 percent of the nameplate frequency as specified by the manufacturer. If the dryer has a dual voltage conversion capability, conduct test at the highest voltage specified by the manufacturer.

2.3.1.1 *Supply voltage waveform.* For the clothes dryer standby mode and off mode testing, maintain the electrical supply voltage waveform indicated in section 4, paragraph 4.4 of IEC 62301 (incorporated by reference; *see* § 430.3).

2.3.2 *Gas supply.*

2.3.2.1 *Natural gas.* Maintain the gas supply to the clothes dryer immediately ahead of all controls at a pressure of 7 to 10 inches of water column. If the clothes dryer is equipped with a gas appliance pressure regulator for which the manufacturer specifies an outlet pressure, the regulator outlet pressure shall be approximately that recommended by the manufacturer. The hourly Btu rating of the burner shall be maintained within ±5 percent of the rating specified by the manufacturer. The natural gas supplied should have a heating value of approximately 1,025 Btus per standard cubic foot. The actual heating value, H_n2, in Btus per standard cubic foot, for the natural gas to be used in the test shall be obtained either from measurements made by the manufacturer conducting the test using a standard continuous flow calorimeter as described in 2.4.6 or by the purchase of bottled natural gas whose Btu rating is certified to be at least as accurate a rating as could be obtained from measurements with a standard continuous flow calorimeter as described in 2.4.6.

2.3.2.2 *Propane gas.* Maintain the gas supply to the clothes dryer immediately ahead of all controls at a pressure of 11 to 13 inches of water column. If the clothes dryer is equipped with a gas appliance pressure regulator for which the manufacturer specifies an outlet pressure, the regulator outlet pressure shall be approximately that recommended by the manufacturer. The hourly Btu rating of the burner shall be maintained within ±5 percent of the rating specified by the manufacturer. The propane gas supplied should have a heating value of approximately 2,500 Btus per standard cubic foot. The actual heating value, H_p, in Btus per standard cubic foot, for the propane gas to be used in the test shall be obtained either from measurements made by the manufacturer conducting the test using a standard continuous flow calorimeter as described in 2.4.6 or by the purchase of bottled gas whose Btu rating is certified to be at least as accurate a rating as could be obtained from measurement with a standard continuous calorimeter as described in 2.4.6.

2.4 *Instrumentation.* Perform all test measurements using the following instruments as appropriate.

2.4.1 *Weighing scale for test cloth.* The scale shall have a range of 0 to a maximum of 30 pounds with a resolution of at least 0.2 ounces and a maximum error no greater than 0.3 percent of any measured value within the range of 3 to 15 pounds.

2.4.1.2 *Weighing scale for drum capacity measurements.* The scale should have a range of 0 to a maximum of 500 pounds with resolution of 0.50 pounds and a maximum error no greater than 0.5 percent of the measured value.

2.4.2 *Kilowatt-hour meter.* The kilowatt-hour meter shall have a resolution of 0.001 kilowatt-hours and a maximum error no greater than 0.5 percent of the measured value.

2.4.3 *Gas meter.* The gas meter shall have a resolution of 0.001 cubic feet and a maximum error no greater than 0.5 percent of the measured value.

2.4.4 *Dry and wet bulb psychrometer.* The dry and wet bulb psychrometer shall have an error no greater than ±1 °F.

2.4.5 *Temperature.* The temperature sensor shall have an error no greater than ±1 °F.

2.4.6 *Standard Continuous Flow Calorimeter.* The Calorimeter shall have an operating range of 750 to 3,500 Btu per cubic feet. The maximum error of the basic calorimeter shall be no greater than 0.2 percent of the actual heating value of the gas used in the test. The indicator readout shall have a maximum error no greater than 0.5 percent of the measured value within the operating range and a resolution of 0.2 percent of the full-scale reading of the indicator instrument.

2.4.7 *Standby mode and off mode watt meter.* The watt meter used to measure standby mode and off mode power consumption of the clothes dryer shall have the resolution specified in section 4, paragraph 4.5 of IEC 62301(incorporated by reference; *see* § 430.3). The watt meter shall also be able to record a "true" average power as specified in section 5, paragraph 5.3.2(a) of IEC 62301.

2.5 *Lint trap.* Clean the lint trap thoroughly before each test run.

2.6 *Test Clothes.*

2.6.1 *Energy test cloth.* The energy test cloth shall be clean and consist of the following:

(a) Pure finished bleached cloth, made with a momie or granite weave, which is a blended fabric of 50-percent cotton and 50-percent polyester and weighs within +10 percent of 5.75 ounces per square yard after test cloth preconditioning, and has 65 ends on the warp and 57 picks on the fill. The individual warp and fill yarns are a blend of 50-percent cotton and 50-percent polyester fibers.

(b) Cloth material that is 24 inches by 36 inches and has been hemmed to 22 inches by 34 inches before washing. The maximum shrinkage after five washes shall not be more than 4 percent on the length and width.

(c) The number of test runs on the same energy test cloth shall not exceed 25 runs.

2.6.2 *Energy stuffer cloths.* The energy stuffer cloths shall be made from energy test cloth material, and shall consist of pieces of material that are 12 inches by 12 inches and have been hemmed to 10 inches by 10 inches before washing. The maximum shrinkage

after five washes shall not be more than 4 percent on the length and width. The number of test runs on the same energy stuffer cloth shall not exceed 25 runs after test cloth preconditioning.

2.6.3 *Test Cloth Preconditioning.*

A new test cloth load and energy stuffer cloths shall be treated as follows:

(1) Bone dry the load to a weight change of ± 1 percent, or less, as prescribed in section 1.5.

(2) Place test cloth load in a standard clothes washer set at the maximum water fill level. Wash the load for 10 minutes in soft water (17 parts per million hardness or less), using 60.8 grams of AHAM standard test detergent Formula 3. Wash water temperature is to be controlled at 140 ° ± 5 °F (60 ° ± 2.7 °C). Rinse water temperature is to be controlled at 100 ° ± 5 °F (37.7 ± 2.7 °C).

(3) Rinse the load again at the same water temperature.

(4) Bone dry the load as prescribed in Section 1.5 and weigh the load.

(5) This procedure is repeated until there is a weight change of 1 percent or less.

(6) A final cycle is to be a hot water wash with no detergent, followed by two warm water rinses.

2.7 *Test loads.*

2.7.1 *Compact size dryer load.* Prepare a bone-dry test load of energy cloths which weighs 3.00 pounds ± .03 pounds. Adjustments to the test load to achieve the proper weight can be made by the use of energy stuffer cloths, with no more than five stuffer cloths per load. Dampen the load by agitating it in water whose temperature is 100 °F ± 5 °F and consists of 0 to 17 parts per million hardness for approximately two minutes in order to saturate the fabric. Then, extract water from the wet test load by spinning the load until the moisture content of the load is between 42–47 percent of the bone-dry weight of the test load. Make a final mass adjustment, such that the moisture content is 47 percent ± 0.33 percent by adding water uniformly to the load in a very fine spray.

2.7.2 *Standard size dryer load.* Prepare a bone-dry test load of energy cloths which weighs 8.45 pounds ± .085 pounds. Adjustments to the test load to achieve the proper weight can be made by the use of energy stuffer cloths, with no more than five stuffer cloths per load. Dampen the load by agitating it in water whose temperature is 100 °F ± 5 °F and consists of 0 to 17 parts per million hardness for approximately two minutes in order to saturate the fabric. Then, extract water from the wet test load by spinning the load until the moisture content of the load is between 42–47 percent of the bone-dry weight of the test load. Make a final mass adjustment, such that the moisture content is 47 percent ± 0.33 percent by adding water uniformly to the load in a very fine spray.

2.7.3 *Method of loading.* Load the energy test cloths by grasping them in the center, shaking them to hang loosely, and then dropping them in the dryer at random.

2.8 *Clothes dryer preconditioning.*

2.8.1 *Conventional clothes dryers.* For conventional clothes dryers, before any test cycle, operate the dryer without a test load in the non-heat mode for 15 minutes or until the discharge air temperature is varying less than 1 °F for 10 minutes—whichever is longer—in the test installation location with the ambient conditions within the specified test condition tolerances of 2.2.

2.8.2 *Vent-less clothes dryers.* For vent-less clothes dryers, before any test cycle, the steady-state temperature must be equal to ambient room temperature described in 2.2.1. This can be done by leaving the machine at ambient room conditions for at least 12 hours but not more than 36 hours between tests.

3. Test Procedures and Measurements

3.1 *Drum Capacity.* Measure the drum capacity by sealing all openings in the drum except the loading port with a plastic bag, and ensure that all corners and depressions are filled and that there are no extrusions of the plastic bag through the opening in the drum. Support the dryer's rear drum surface on a platform scale to prevent deflection of the dryer, and record the weight of the empty dryer. Fill the drum with water to a level determined by the intersection of the door plane and the loading port. Record the temperature of the water and then the weight of the dryer with the added water and then determine the mass of the water in pounds. Add or subtract the appropriate volume depending on whether or not the plastic bag protrudes into the drum interior. The drum capacity is calculated as follows:

$C = w/d$

C = capacity in cubic feet.

w = weight of water in pounds.

d = density of water at the measured temperature in pounds per cubic feet.

3.2 *Dryer Loading.* Load the dryer as specified in 2.7.

3.3 *Test cycle*

3.3.1 *Timer dryers.* For timer dryers, as defined in 1.20, operate the clothes dryer at the maximum temperature setting and, if equipped with a timer, at the maximum time setting and dry the load until the moisture content of the test load is between 5 and 6 percent of the bone-dry weight of the test load, but do not permit the dryer to advance into cool down. If required, reset the timer. Record the data specified by section 3.4. Repeat the procedure to dry the load until the moisture content of the test load is between 4 and 5 percent of the bone-dry weight of the test load. If the dryer automatically stops during a cycle and the reason is that the condensation box is full of water, the test is stopped, and the test run is invalid. The first test cycle after a period of non-operation longer than 36 hours for vent-less dryers, as defined in 1.21, shall not be used for evaluation. For vent-less dryers, during the time between two cycles, the door of the dryer shall be closed except for loading (and unloading).

3.3.2 *Automatic termination control dryers.* For automatic termination control dryers, as defined in 1.4, a "normal" program shall be selected for the test cycle. Where the drying temperature can be chosen independently of the program, it shall be set to the maximum. Operate the clothes dryer and monitor the dryer as it progresses through the program. When the heater switches off for the final time, immediately before the cool-down period begins, stop the dryer. Record the data specified by 3.4. If the final moisture content is greater than 5 percent, the test shall be invalid and a new run shall be conducted using the highest dryness level setting. If the dryer automatically stops during a cycle and the reason is that the condensation box is full of water, the test is stopped, and the test run is invalid. The first test cycle after a period of non-operation longer than 36 hours for vent-less dryers, as defined in 1.21, shall not be used for evaluation. For vent-less dryers, during the time between two cycles, the door of the dryer shall be closed except for loading (and unloading).

3.4 *Data recording.* Record for each test cycle:

3.4.1 Bone-dry weight of the test load described in 2.7.

3.4.2 Moisture content of the wet test load before the test, as described in 2.7.

3.4.3 Moisture content of the dry test load obtained after the test described in 3.3.

3.4.4 Test room conditions, temperature, and percent relative humidity described in 2.2.1.

3.4.5 For electric dryers—the total kilowatt-hours of electric energy, E_t, consumed during the test described in 3.3.

3.4.6 For gas dryers:

3.4.6.1 Total kilowatt-hours of electrical energy, E_{te}, consumed during the test described in 3.3.

3.4.6.2 Cubic feet of gas per cycle, E_{tg}, consumed during the test described in 3.3.

3.4.6.3 On gas dryers using a continuously burning pilot light—the cubic feet of gas, E_{pg}, consumed by the gas pilot light in one hour.

3.4.6.4 Correct the gas heating value, GEF, as measured in 2.3.2.1 and 2.3.2.2, to standard pressure and temperature conditions in accordance with U.S. Bureau of Standards, circular C417, 1938.

3.4.7 The cycle settings selected for the automatic termination control dryer test in 3.3.2.

3.5 *Test for automatic termination field use factor credits.* Credit for automatic termination can be claimed for those dryers which meet the requirements for either temperature-sensing control, 1.19, or moisture-sensing control, 1.15, and having present the appropriate mark or detent feed defined in 1.3.

3.6 *Standby mode and off mode power.* Establish the testing conditions set forth in Section 2, "Testing Conditions," of this appendix, omitting the requirement to disconnect all console light or other lighting systems on the clothes dryer that do not consume more than 10 watts during the clothes dryer test cycle in section 2.1. Prior to the initiation of the test measurements, the clothes dryer should be configured in the settings that produce the highest power consumption level, consistent with the particular mode definition under test. If the clothes dryer waits in a higher power state at the start of standby mode or off mode before dropping to a lower power state, as discussed in section 5, paragraph 5.1, note 1 of IEC 62301 (incorporated by reference; see § 430.3),wait until the clothes dryer passes

into the lower power state before starting the measurement. Follow the test procedure specified in section 5, paragraph 5.3 of IEC 62301 for testing in each possible mode as described in 3.6.1 and 3.6.2, except allowing the product to stabilize for 30 to 40 minutes and using an energy use measurement period of 10 minutes. For units in which power varies over a cycle, as described in section 5, paragraph 5.3.2 of IEC 62301, use the average power approach described in paragraph 5.3.2(a) of IEC 62301, except allowing the product to stabilize for 30 to 40 minutes and using an energy use measurement period not less than 10 minutes.

3.6.1 If a clothes dryer has an inactive mode, as defined in 1.13, measure and record the average inactive mode power of the clothes dryer, P_{IA}, in watts.

3.6.2 If a clothes dryer has an off mode, as defined in 1.16, measure and record the average off mode power of the clothes dryer, P_{OFF}, in watts.

4. Calculation of Derived Results From Test Measurements

4.1 *Per-cycle electric timer dryer energy consumption for 5-percent final moisture content.* Calculate the electric timer dryer energy consumption per cycle, E_t, expressed in kilowatt-hours per cycle and defined as:

$$E_t = E_{t1} + [(RMC_1 - RMC_3) \times (E_{t2} - E_{t1})/(RMC_1 - RMC_2)],$$

E_{t1} = the energy recorded in 3.4.5 for the test described in 3.3 for timer dryers for a final moisture content between 5 and 6 percent.

E_{t2} = the energy recorded in 3.4.5 for the test described in 3.3 for timer dryers for a final moisture content between 4 and 5 percent.

RMC_1 = the moisture content in 3.4.3 for the test described in 3.3 for timer dryers for a final moisture content between 5 and 6 percent.

RMC_2 = the moisture content in 3.4.3 for the test described in 3.3 for timer dryers for a final moisture content between 4 and 5 percent.

RMC_3 = 5 percent.

4.2 *Total per-cycle electric dryer energy consumption.* Calculate the total electric dryer energy consumption per cycle, E_{ce}, expressed in kilowatt-hours per cycle and defined as:

$$E_{ce} = E_t \times FU,$$

Where

E_t = the energy calculated in 4.1 for timer dryers or recorded in 3.4.5 for automatic termination control dryers

FU = Field use factor

=1.18 for timer dryers, as defined in 1.20.

=1.0 for automatic termination control dryers, as defined in 1.4.

4.3 *Per-cycle gas timer dryer electrical energy consumption for 5-percent final moisture content.* Calculate the gas timer dryer electrical energy consumption per cycle, E_{te}, expressed in kilowatt-hours per cycle and defined as:

$$E_{te} = E_{te1} + [(RMC_1 - RMC_3) \times (E_{te2} - E_{te1})/(RMC_1 - RMC_2)],$$

Where

E_{te1} = the energy recorded in 3.4.6.1 for the test described in 3.3 for timer dryers for a final moisture content between 5 and 6 percent.

E_{te2} = the energy recorded in 3.4.6.1 for the test described in 3.3 for timer dryers for a final moisture content between 4 and 5 percent.

RMC_1, RMC_2, RMC_3 as defined in 4.1.

4.4 *Total per-cycle gas dryer electrical energy consumption.* Calculate the gas dryer electrical energy consumption per cycle, E_{ge}, expressed in kilowatt-hours per cycle and defined as:

$$E_{ge} = E_{te} \times FU,$$

Where

E_{te} = the energy calculated in 4.3 for timer dryers or recorded in 3.4.6.1 for automatic termination control dryers.

FU = as defined in 4.2.

4.5 *Per-cycle gas timer dryer gas energy consumption for 5-percent final moisture content.* Calculate the gas timer dryer energy consumption per cycle, E_{tg}, expressed in Btu's per cycle and defined as:

$$E_{tg} = E_{tg1} + [(RMC_1 - RMC_3) \times (E_{tg2} - E_{tg1})/(RMC_1 - RMC_2),$$

Where

E_{tg1} = the energy recorded in 3.4.6.2 for the test described in 3.3 for timer dryers for a final moisture content between 5 and 6 percent.

E_{tg2} = the energy recorded in 3.4.6.2 for the test described in 3.3 for timer dryers for a final moisture content between 4 and 5 percent.

RMC_1, RMC_2, RMC_3 as defined in 4.1.

4.6 *Total per-cycle gas dryer gas energy consumption.* Calculate the gas dryer gas energy consumption per cycle, E_{gg}, expressed in Btu's per cycle and defined as:

$$E_{gg} = E_{tg} \times FU \times GEF,$$

Where

E_{tg} = the energy calculated in 4.5 for timer dryers or recorded in 3.4.6.2 for automatic termination control dryers.

FU = as defined in 4.2.

GEF = corrected gas heat value (Btu per cubic feet) as defined in 3.4.6.4.

4.7 *Per-cycle gas dryer continuously burning pilot light gas energy consumption.* Calculate the gas dryer continuously burning pilot light gas energy consumption per cycle, E_{up}, expressed in Btu's per cycle and defined as:

$$E_{up} = E_{pg} \times ((8760 - 140)/283) \times GEF,$$

E_{pg} = the energy recorded in 3.4.6.3

8760 = number of hours in a year

283 = representative average number of clothes dryer cycles in a year

140 = estimated number of hours that the continuously burning pilot light is on during the operation of the clothes dryer for the representative average use cycle for clothes dryers (283 cycles per year)

GEF as defined in 4.6

4.8 *Total per-cycle gas dryer gas energy consumption expressed in Btu's.* Calculate the total gas dryer energy consumption per cycle, E_g, expressed in Btu's per cycle and defined as:

$$E_g = E_{gg} + E_{up}$$

E_{gg} as defined in 4.6

E_{up} as defined in 4.7

4.9 *Total per-cycle gas dryer energy consumption expressed in kilowatt-hours.* Calculate the total gas dryer energy consumption per cycle, E_{cg}, expressed in kilowatt-hours per cycle and defined as:

$$E_{cg} = E_{ge} + (E_g/3412 \text{ Btu/kWh})$$

E_{ge} as defined in 4.4

E_g as defined in 4.8

4.10 *Per-cycle standby mode and off mode energy consumption.* Calculate the dryer inactive mode and off mode energy consumption per cycle, E_{TSO}, expressed in kWh per cycle and defined as:

$$E_{TSO} = [(P_{IA} \times S_{IA}) + (P_{OFF} \times S_{OFF})] \times K/283$$

Where:

P_{IA}= dryer inactive mode power, in watts, as measured in section 3.6.1;

P_{OFF} = dryer off mode power, in watts, as measured in section 3.6.2.

If the clothes dryer has both inactive mode and off mode, S_{IA} and S_{OFF} both equal 8,620 ÷ 2 = 4,310, where 8,620 is the total inactive and off mode annual hours;

If the clothes dryer has an inactive mode but no off mode, the inactive mode annual hours, S_{IA}, is equal to 8,620 and the off mode annual hours, S_{OFF}, is equal to 0;

If the clothes dryer has an off mode but no inactive mode, S_{IA} is equal to 0 and S_{OFF} is equal to 8,156

Where

K = 0.001 kWh/Wh conversion factor for watt-hours to kilowatt-hours; and

283 = representative average number of clothes dryer cycles in a year.

4.11 *Per-cycle combined total energy consumption expressed in kilowatt-hours.* Calculate the per-cycle combined total energy consumption, E_{CC}, expressed in kilowatt-hours per cycle and defined for an electric clothes dryer as:

$$E_{CC} = E_{ce} + E_{TSO}$$

Where:

E_{ce} = the energy recorded in 4.2, and

E_{TSO} = the energy recorded in 4.10,

and defined for a gas clothes dryer as:

$$E_{CC} = E_{cg} + E_{TSO}$$

Where:

E_{cg} = the energy recorded in 4.9, and
E_{TSO} = the energy recorded in 4.10.

6. Appendix F to subpart B of part 430 is revised to read as follows:

Appendix F to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Room Air Conditioners

Note: Manufacturers are not required to use the test procedures and calculations that refer to standby mode and off mode energy consumption, (specifically, sections 2.2, 3.2, 4.2, and 5.3 of this appendix F) until the mandatory compliance date of amended energy conservation standards for room air conditioners at 10 CFR 430.32(b).

1. Definitions

1.1 "Active mode" means a mode in which the room air conditioner is connected to a mains power source, has been activated and is performing the main function of cooling or heating the conditioned space, or circulating air through activation of its fan or blower, with or without energizing active air-cleaning components or devices such as ultraviolet (UV) radiation, electrostatic filters, ozone generators, or other air-cleaning devices.

1.2 "*ANSI/AHAM RAC–1*" means the test standard published by jointly by the American National Standards Institute and the Association of Home Appliance Manufacturers, titled "Room Air Conditioners," Standard RAC–1–2008 (incorporated by reference; see § 430.3).

1.3 "*ANSI/ASHRAE 16*" means the test standard published by jointly by the American National Standards Institute and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, titled "Method of Testing for Rating Room Air Conditioners and Packaged Terminal Air Conditioners," Standard 16–1983 (reaffirmed 2009) (incorporated by reference; see § 430.3).

1.4 "*IEC 62301*" means the test standard published by the International Electrotechnical Commission, titled "Household electrical appliances—Measurement of standby power," Publication 62301 (First Edition 2005–06), IEC 62301–2005–6 (incorporated by reference; see § 430.3).

1.5 "*Inactive mode*" means a standby mode that facilitates the activation of active mode by remote switch (including remote control) or internal sensor or which provides continuous status display.

1.6 "*Off mode*" means a mode in which a room air conditioner is connected to a mains power source and is not providing any active or standby mode function and where the mode may persist for an indefinite time. An indicator that only shows the user that the product is in the off position is included within the clasification of an off mode.

1.7 "*Standby mode*" means any product modes where the where the energy using product is connected to a mains power source and offers one or more of the following user oriented or protective functions which may persist for an indefinite time:

(a) To facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer.

(b) Continuous functions, including information or status displays (including clocks) or sensor-based functions. A timer is a continuous clock function (which may or may not be associated with a display) that provides regular scheduled tasks (*e.g.,* switching) and that operates on a continuous basis.

2. Test Methods

2.1 *Cooling.* The test method for testing room air conditioners in cooling mode shall consist of application of the methods and conditions in ANSI/AHAM RAC–1 sections 4, 5, 6.1, and 6.5 (incorporated by reference; see § 430.3), and in ANSI/ASHRAE 16 (incorporated by reference; see § 430.3).

2.2 *Standby and off modes.* The method for testing room air conditioners in standby and off modes shall consist of application of the methods and conditions in IEC 62301 (incorporated by reference; *see* § 430.3), as modified by the requirements of this standard. The testing may be conducted in test facilities used for testing cooling performance. If testing is not conducted in such a facility, the test facility shall comply with IEC 62301 section 4.2.

3. Test Conditions

3.1 *Cooling mode.* Establish the test conditions described in sections 4 and 5 of ANSI/AHAM RAC–1 (incorporated by reference; see § 430.3) and in accordance with ANSI/ASHRAE 16 (incorporated by reference; see § 430.3).

3.2 *Standby and off modes.*

3.2.1 *Test room conditions.* Maintain the indoor test conditions as required by section 4.2 of IEC 62301 (incorporated by reference; see § 430.3). If the standby and off mode testing is conducted in a facility that is also used for testing cooling performance, maintain the outdoor test conditions either as required by section 4.2 of IEC 62301or as described in section 3.1. If the unit is equipped with an outdoor air ventilation damper, close this damper during testing.

3.2.2 *Power supply.* Maintain power supply conditions specified in section 4.3 of IEC 62301 (incorporated by reference; see § 430.3). Use room air conditioner nameplate voltage and frequency as the basis for power supply conditions. Maintain power supply voltage waveform according to the requirements of section 4.4 of IEC 62301.

3.2.3 *Watt meter.* The watt meter used to measure standby mode and off mode power consumption of the room air conditioner shall have the resolution specified in section 4, paragraph 4.5 of IEC 62301 (incorporated by reference; see § 430.3). The watt meter shall also be able to record a "true" average power specified in section 5, paragraph 5.3.2(a) of IEC 62301.

4. Measurements

4.1 *Cooling mode.* Measure the quantities delineated in section 5 of ANSI/AHAM RAC–1 (incorporated by reference; see § 430.3).

4.2 *Standby and off modes.* Establish the testing conditions set forth in section 3.2. Prior to the initiation of the test measurements, the room air conditioner should be configured in the settings that produce the highest power consumption level, consistent with the particular mode definition under test. For room air conditioners that drop from a higher power state to a lower power state as discussed in section 5, paragraph 5.1, note 1 of IEC 62301 (incorporated by reference; see § 430.3), allow sufficient time for the room air conditioner to reach the lower power state before proceeding with the test measurement. Follow the test procedure specified in section 5, paragraph 5.3 of IEC 62301 for testing in each possible mode as described in 4.2.1 and 4.2.2, except allowing the product to stabilize for 5 to 10 minutes and using an energy use measurement period of 5 minutes. For units in which power varies over a cycle, as described in section 5, paragraph 5.3.2 of IEC 62301, use the average power approach in paragraph 5.3.2(a).

4.2.1 If a room air conditioner has an inactive mode, as defined in 1.5, measure and record the average inactive mode power of the room air conditioner, P_{IA}, in watts.

4.2.2 If a room air conditioner has an off mode, as defined in 1.6, measure and record the average off mode power of the room air conditioner, P_{OFF}, in watts.

5. Calculations

5.1 Calculate the cooling capacity (expressed in Btu/hr) as required in section 6.1 of ANSI/AHAM RAC–1 (incorporated by reference; see § 430.3) and in accordance with ANSI/ASHRAE 16 (incorporated by reference; see § 430.3).

5.2 Determine the electrical power input (expressed in watts) as required by section 6.5 of ANSI/AHAM RAC–1 (incorporated by reference; see § 430.3) and in accordance with ANSI/ASHRAE 16 (incorporated by reference; see § 430.3).

5.3 *Standby mode and off mode annual energy consumption.* Calculate the standby mode and off mode annual energy consumption for room air conditioners, E_{TSO}, expressed in kilowatt-hours per year, according to the following:

$$E_{TSO} = [(P_{IA} \times S_{IA}) + (P_{OFF} \times S_{OFF})] \times K$$

Where:

P_{IA}= room air conditioner inactive mode power, in watts, as measured in section 4.2.1

P_{OFF} = room air conditioner off mode power, in watts, as measured in section 4.2.2.

If the room air conditioner has both inactive mode and off mode, S_{IA} and S_{OFF} both equal 5,115 ÷ 2 = 2,557.5, where 5,115 is the total inactive and off mode annual hours;

If the room air conditioner has an inactive mode but no off mode, the inactive mode annual hours, S_{IA}, is equal to 5,115 and the off mode annual hours, S_{OFF}, is equal to 0;

If the room air conditioner has an off mode but no inactive mode, S_{IA} is equal to 0 and

S_{OFF} is equal to S_{TOT};

K = 0.001 kWh/Wh conversion factor for watt-hours to kilowatt-hours.

[FR Doc. 2010–15025 Filed 7–22–10; 8:45 am]

BILLING CODE 6450–01–P