



6450-01-P

DEPARTMENT OF ENERGY

10 CFR Parts 429 and 430

[Docket No. EERE-2008-BT-TP-0011]

RIN: 1904 – AB78

Energy Conservation Program: Test Procedure for Microwave Ovens

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

ACTION: Supplemental notice of proposed rulemaking.

SUMMARY: The U.S. Department of Energy (DOE) published an interim final rule on March 9, 2011, amending its test procedures for microwave ovens under the Energy Policy and Conservation Act (EPCA) to provide for the measurement of standby mode and off mode power use by microwave ovens. Those amendments incorporated into the DOE test procedure provisions from the International Electrotechnical Commission (IEC) Standard 62301, “Household electrical appliances—Measurement of standby power,” First Edition 2005-06 (IEC Standard 62301 (First Edition)). In addition, those amendments adopted in the DOE test procedure definitions of modes based on the relevant provisions from the IEC Standard 62301 Second Edition, Final Draft International Standard (IEC Standard 62301 (FDIS)), as well as language to clarify application of these provisions for measuring standby mode and off mode power consumption in microwave ovens. Just prior to publication of the interim final rule, the

IEC replaced the First Edition of this standard with the current Second Edition. This supplemental notice of proposed rulemaking proposes to incorporate the latest edition of IEC Standard 62301.

DATES: DOE will accept comments, data, and information regarding this supplemental notice of proposed rulemaking (SNOPR) submitted no later than **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. See section V, “Public Participation,” for details.

ADDRESSES: Any comments submitted must identify the SNOPR on Test Procedures for Microwave Ovens, and provide docket number EERE-2008-BT-TP-0011 and/or regulatory information number (RIN) 1904-AB78. Comments may be submitted using any of the following methods:

1. Federal eRulemaking Portal: www.regulations.gov. Follow the instructions for submitting comments.
2. E-mail: MicroOven-2008-TP-0011@ee.doe.gov. Include docket number EERE-2008-BT-TP-0011 and/or RIN 1904-AB78 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. If possible, please submit all items on a compact disc (CD), in which case it is not necessary to include printed copies.
4. Hand Delivery/Courier: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 6th Floor, 950 L’Enfant Plaza SW., Washington, DC 20024.

Telephone: (202) 586-2945. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

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

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

A link to the docket web page can be found at:

<http://www.regulations.gov/#!docketDetail;rpp=10;po=0;D=EERE-2008-BT-TP-0011>. This web page contains a link to the docket for this notice on the www.regulations.gov site. The www.regulations.gov web page contains simple instructions on how to access all documents, including public comments, in the docket. See section V for information on how to submit comments through www.regulations.gov.

For further information on how to submit a comment or review other public comments and the docket, contact Ms. Brenda Edwards at (202) 586-2945 or email:

Brenda.Edwards@ee.doe.gov.

FOR FURTHER INFORMATION CONTACT:

Mr. Wes Anderson, U.S. Department of Energy, Energy Efficiency and Renewable Energy, Building Technologies Program, EE-2J, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Tel.: (202) 586-7335. E-mail: Wes.Anderson@ee.doe.gov.

Mr. Ari Altman, U.S. Department of Energy, Office of the General Counsel, GC-71, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Tel.: (202) 287-6307, E-mail: Ari.Altman@hq.doe.gov.

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I. Background and Legal Authority

Title III of the Energy Policy and Conservation Act (42 U.S.C. 6291 et seq.; “EPCA” or, “the Act”) sets forth a variety of provisions designed to improve energy efficiency. (All references to EPCA refer to the statute as amended through the Energy Independence and Security Act of 2007 (EISA 2007), Pub. L. 110-140 (Dec. 19, 2007)). Part B of title III, which for editorial reasons was redesignated as Part A upon incorporation into the U.S. Code (42 U.S.C. 6291–6309), establishes the “Energy Conservation Program for Consumer Products Other Than Automobiles,” including microwave ovens, the subject of today’s notice. (42 U.S.C. 6291(1)–(2) and 6292(a)(10))

Under EPCA, this program consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. The testing requirements consist of test procedures that manufacturers of covered products must use (1) as the basis for certifying to DOE that their products comply with the applicable energy conservation standards adopted under EPCA, and (2) for making representations about the efficiency of those products. Similarly, DOE must use these test requirements to determine whether the products comply with any relevant standards promulgated under EPCA.

General Test Procedure Rulemaking Process

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered products. EPCA provides in relevant

part 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 and shall not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

In addition, if DOE determines that a test procedure amendment is warranted, it must publish proposed test procedures and offer the public an opportunity to present oral and written comments on them. (42 U.S.C. 6293(b)(2)) Finally, in any rulemaking to amend a test procedure, DOE must determine 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. (42 U.S.C. 6293(e)(2))

The EISA 2007 amendments to EPCA, in relevant part, require DOE to amend the test procedures for all residential covered products to include measures of standby mode and off mode energy consumption. Specifically, section 310 of EISA 2007 provides definitions of “standby mode” and “off mode” (42 U.S.C. 6295(gg)(1)(A)) and permits DOE to amend these definitions in the context of a given product (42 U.S.C. 6295(gg)(1)(B)). The statute requires integration of such energy consumption “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.” (42 U.S.C. 6295(gg)(2)(A))

Under the statutory provisions adopted by EISA 2007, any such amendment must consider the most current versions of IEC Standard 62301, “Household electrical appliances – Measurement of standby power,” and IEC Standard 62087, “Methods of measurement for the power consumption of audio, video, and related equipment.”¹ *Id.* At the time of the enactment of EISA 2007, the most current versions of these standards were IEC Standard 62301 (First Edition 2005-06) and IEC Standard 62087 (Second Edition 2008-09).

DOE Test Procedure at Appendix I

Historically, DOE’s active mode test procedure for microwave ovens appeared at appendix I to subpart B of Title 10 of the Code of Federal Regulations (CFR).² That test procedure was part of an October 3, 1997 final rule that also revised the test procedures for other

¹ EISA 2007 directs DOE to also consider IEC Standard 62087 when amending its test procedures 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. Accordingly, the narrow scope of this particular IEC standard reduces its relevance to today’s proposal.

² In a final rule published on April 8, 2009 (74 FR 16040), DOE found that no active mode cooking efficiency standards were justified for electric cooking products, including microwave ovens. This rulemaking completed the second cycle of rulemakings required by the NAECA amendments to EPCA. (42 U.S.C. 6295(h)(2)) In its analysis for the second cycle of rulemakings, DOE determined that the microwave oven test procedure provisions to measure cooking efficiency do not produce accurate and repeatable test results. DOE was unaware of any test procedures that had been developed that addressed the concerns with the DOE microwave oven cooking efficiency test procedure. DOE, therefore, repealed the regulatory provisions establishing the active mode cooking efficiency test procedure for microwave ovens under EPCA in a final rule published on July 22, 2010 (the July 2010 TP Final Rule). 75 FR 42579. DOE also published a notice of a public meeting to discuss a separate rulemaking process to replace the repealed provisions for measuring microwave oven energy efficiency in active mode on July 22, 2010. 75 FR 42611.

cooking products to measure their efficiency and energy use more accurately. 62 FR 51976. That final rule incorporated portions of IEC Standard 705-1998 and Amendment 2-1993, “Methods for Measuring the Performance of Microwave Ovens for Households and Similar Purposes” to measure microwave oven cooking efficiency, but did not address energy use in the standby or off modes. Id.

DOE published a notice of proposed rulemaking (NOPR) on October 17, 2008 (hereafter referred to as the October 2008 TP NOPR), in which it proposed incorporating provisions from IEC Standard 62301 (First Edition) into the DOE active mode test procedure, as well as language to clarify application of these provisions for measuring standby mode and off mode power in microwave ovens. 73 FR 62134. DOE held a public meeting on November 14, 2008 (hereafter referred to as the November 2008 public meeting) to hear oral comments on and solicit information relevant to the October 2008 TP NOPR. Interested parties remarked upon, among other things, harmonization of standards and test procedures with those of other countries and international agencies. In particular commenters urged DOE to consider IEC Standard 62301, “Household electrical appliances – Measurement of standby power,” Edition 2.0 2011-01 (IEC Standard 62301 (Second Edition) or “Second Edition”), which was in the process of being drafted.

EPCA requires DOE to consider the most recent version of IEC Standard 62301. (42 U.S.C. 6295(gg)(2)(A)) After the October 2008 TP NOPR was published, DOE determined that it would consider the revised version of IEC Standard 62301, (i.e., IEC Standard 62301 (Second Edition)), in the microwave oven test procedure rulemaking. DOE anticipated, based on review

of drafts of the updated IEC Standard 62301, that the revisions could include different mode definitions. The revised version was expected in July 2009. IEC Standard 62301 (Second Edition) was not published, however, until January 27, 2011.

Because the EISA 2007 amendments to EPCA required DOE to establish test procedures for standby mode and off mode by March 31, 2011, and because DOE is conducting a concurrent energy conservation standards rulemaking for standby and off mode energy use, discussed below, DOE published a supplemental notice of proposed rulemaking (SNOPR) on July 22, 2010 (hereafter referred to as the July 2010 TP SNOPR) proposing mode definitions based on those in the then current draft version of IEC Standard 62301 (Second Edition), designated as IEC Standard 62301 Second Edition, Committee Draft for Vote (IEC Standard 62301 (CDV)). 75 FR 42612, 42620–23 (July 22, 2010). DOE noted in the July 2010 TP SNOPR that IEC Standard 62301 (CDV) contained proposed amendments to IEC Standard 62301 (First Edition), including new mode definitions based on those proposed in IEC Standard 62301 (Second Edition), Committee Draft 2 (IEC Standard 62301 (CD2))³ and which addressed comments received by interested parties in response to IEC Standard 62301 (CD2). As a result of this continued refinement on the basis of public comment, DOE stated that it believed that those most recent mode definitions represented the best definitions available for the analysis in support of this rulemaking. 75 FR 42612, 42621.

DOE held a public meeting on September 16, 2010 (hereafter referred to as the September 2010 public meeting), to hear oral comments on and solicit information relevant to

³ IEC Standard 62301 (CD2) was the draft version immediately preceding IEC Standard 62301 (CDV).

the July 2010 TP SNO PR. Interested parties remarked upon, among other things, covered products, incorporation of IEC Standard 62301 (First Edition), mode definitions, and testing procedures. On October 29, 2010, the IEC released a finalized draft version of IEC Standard 62301 (Second Edition), IEC Standard 62301 (FDIS).

On March 9, 2011, DOE published an interim final rule (hereafter referred to as the March 2011 Interim Final Rule) amending the test procedures for microwave ovens. 76 FR 12825. The March 2011 Interim Final Rule incorporated by reference specific clauses from IEC Standard 62301 (First Edition) regarding test conditions and testing procedures for measuring the average standby mode and average off mode power consumption into the microwave oven test procedure. DOE also incorporated into the microwave oven test procedure definitions of “active mode,” “standby mode,” and “off mode” based on the definitions provided in IEC Standard 62301 (FDIS). DOE further adopted language to clarify the application of clauses from IEC Standard 62301 (First Edition) for measuring standby mode and off mode power in the interim final rule. Specifically, DOE defined the test duration for cases in which the measured power is not stable (i.e., varies over a cycle), recognizing that the power consumption of microwave oven displays can vary based on the displayed clock time. 76 FR 12825, 12828.

The amendments adopted in the March 2011 Interim Final Rule became effective on April 8, 2011. However, DOE noted that in order to ensure that the amended test procedure adequately addresses the EISA 2007 requirement to consider the most recent version of IEC Standard 62301, and recognizing that the IEC issued IEC Standard 62301 (Second Edition) in January of 2011, DOE issued the microwave oven test procedure as an interim final rule and

offered an additional 180-day comment period to consider whether any changes should be made to the interim final rule in light of publication of IEC Standard 62301 (Second Edition). DOE stated that it would consider these comments and, to the extent necessary, publish a final rulemaking incorporating any changes. 76 FR 12825, 12830-31. In response to the March 2011 Interim Final Rule, interested parties commented, among other things, that DOE should incorporate by reference IEC Standard 62301 (Second Edition) for optimal international harmonization, to give clarity and consistency to the regulated community and to decrease the testing burden.

As stated above, DOE is considering amended microwave oven energy conservation standards addressing standby and off mode energy use concurrently with the test procedure rulemaking process. The National Appliance Energy Conservation Act of 1987 (NAECA; Pub. L. No. 100-12), which amended EPCA, established prescriptive standards for kitchen ranges and ovens, but no standards were established for microwave ovens. (42 U.S.C. 6295(h)(1)) The NAECA amendments also required DOE to conduct two cycles of rulemakings to determine whether to revise the standard. (42 U.S.C. 6295(h)(2)) DOE undertook the first cycle of these rulemakings and issued a final rule on September 8, 1998 (63 FR 48038), in which DOE found that no amended standards were justified for electric cooking products, including microwave ovens.

DOE initiated the second cycle of energy conservation standards rulemakings for cooking products by publishing a framework document covering, in part, microwave ovens, and giving notice of a public meeting and the availability of the framework document. 71 FR 15059 (March

27, 2006). On November 15, 2007, DOE published an advance notice of proposed rulemaking (ANOPR) (72 FR 64432) (hereafter the November 2007 ANOPR) concerning energy conservation standards for commercial clothes washers and residential dishwashers, dehumidifiers, and cooking products, including microwave ovens (collectively, appliance standards). In the November 2007 ANOPR, DOE determined that energy consumption by microwave ovens in the standby mode represents a significant portion of microwave oven energy use, and that a standard regulating such energy consumption would likely have significant energy savings. 72 FR 64432, 64441–42. Before standby power could be included in an efficiency standard for microwave ovens, however, test procedures for the measurement of standby power would be required. Id.

On December 13, 2007, DOE held a public meeting to receive comments on the November 2007 ANOPR (hereafter referred to as the December 2007 public meeting). At the December 2007 public meeting, DOE presented the possibility that test standard IEC Standard 62301 (First Edition) could be incorporated by reference into DOE's microwave oven test procedure to measure standby power. DOE also discussed clarifications to the IEC Standard 62301 (First Edition) test conditions, including a requirement that, if the measured power were not stable, the standby mode power test would be run for a period of 12 hours with an initial clock setting of 12:00 a.m. This would permit more accurate measurement of average standby power consumption.

DOE published a NOPR for the appliance standards rulemaking on October 17, 2008, in which it tentatively concluded that a standard for microwave oven standby mode and off mode

energy consumption would be technologically feasible and economically justified. 73 FR 62034. DOE received responses to the NOPR from interested parties regarding the harmonization of standards and test procedures with those of other countries and international agencies. As a result of these comments, DOE decided to consider the revised version of IEC Standard 62301 (i.e., IEC Standard 62301 (Second Edition)) in the development of energy conservation standards for the standby mode and off mode power consumption of microwave ovens. As stated above, because the issuance of the revised version did not occur until January 27, 2011, DOE considered the most recent draft at the time, which was version IEC Standard 62301 (CDV) for the July 2010 TP SNO PR and IEC Standard 62301 (FDIS) for the March 2011 TP Interim Final Rule. 75 FR 42612, 42614; 76 FR 12825, 12831-33.

II. Summary of the Supplemental Notice of Proposed Rulemaking

As discussed in section I, DOE published the March 2011 Interim Final Rule to provide an opportunity for it to fully consider whether any changes should be made in light of publication of IEC Standard 62301 (Second Edition). For this reason, and, based upon the public comment received on the March 2011 Interim Final Rule, DOE decided to further analyze IEC Standard 62301 (Second Edition) , which published on January 27, 2011. Consistent with its statutory mandate, DOE has reviewed this latest version of the IEC standard and believes that it improves some measurements of standby mode and off mode energy use. Accordingly, DOE proposes in today's SNO PR to incorporate certain provisions of the IEC Standard 62301 (Second Edition), along with clarifying language, into the DOE test procedures for microwave ovens adopted in the March 2011 Interim Final Rule. In addition, DOE proposes in today's SNO PR to make minor editorial changes in 10 CFR part 430, subpart B, appendix I, section 2.2.1.1 to aid the reader by

presenting the electrical supply voltages consistently for microwave ovens and conventional cooking products, and also in section 1.12 to clarify the alternative use of metric units for various measurements and calculations in the conventional cooking products test procedure. For the reader's convenience, DOE has reproduced in this SNO PR the entire body of regulatory text from the March 2011 Interim Final Rule for the microwave oven test procedure, further amended as appropriate according to today's proposals.

As noted above, EPCA requires that DOE determine whether a proposed test procedure amendment would alter the measured efficiency of a product, thereby requiring adjustment of existing standards. (42 U.S.C. 6293(e)) Because there are currently no Federal energy conservation standards for microwave ovens (including energy use in the standby and off modes), such requirement does not apply to this rulemaking. DOE is conducting a concurrent rulemaking process to consider standby and off mode energy conservation standards and will consider this test procedure rulemaking as any standards are developed.

III. Discussion

A. Products Covered by this Test Procedure Rulemaking

DOE defines "microwave oven" as a class of kitchen ranges and ovens which is a household cooking appliance consisting of a compartment designed to cook or heat food by means of microwave energy. 10 CFR 430.2 In the March 2011 Interim Final Rule, DOE determined that this regulatory definition includes all ovens equipped with microwave capability, including combination ovens (i.e., microwave ovens that incorporate convection features and possibly other means of cooking) because they are capable of cooking or heating food by means

of microwave energy. 76 FR 12825, 12828–30 (March 9, 2011). DOE also determined that the test procedure would not apply to the type of cooking appliance classified by DOE regulations as a microwave/conventional range, which has separate compartments or components consisting of a microwave oven, a conventional oven, and a conventional cooking top. Id. at 12830. DOE noted that it will evaluate any differences among microwave ovens and combination microwave ovens, including installation configurations and heating features that may warrant different product classes or energy conservation standards during its microwave oven standards rulemaking. Id. at 12829–30. DOE also noted that defining a covered product for the purposes of measuring standby mode and off mode energy use does not require that active mode provisions be specified for that same product. When considering future active mode test procedure amendments, DOE will evaluate the suitability of separate provisions for combination microwave ovens to measure the energy performance of heating components other than the microwave portion. Id.

DOE also noted in the March 2011 Interim Final Rule that, based on its limited testing of a small sample of over-the-range microwave ovens, as well as more extensive testing of a sample of over-the-range combination microwave ovens, DOE did not identify any different standby or off modes as compared to countertop microwave-only units. Thus, DOE determined that the measures adopted in the March 2011 Interim Final Rule provide representative measures of standby mode and off mode energy use in countertop and over-the-range configurations of microwave ovens and combination microwave ovens, and did not provide an exclusion for over-the-range units in the definition of covered products. Differences in energy use in these modes between countertop and over-the-range configurations would be evaluated as part of the energy

conservation standards rulemaking addressing standby mode and off mode for microwave ovens.
Id.

The Association of Home Appliance Manufacturers (AHAM) objected to the definition of covered products in the March 2011 Interim Final Rule because it does not consider the effects on a possible future active mode test procedure. AHAM stated that an active mode test procedure is likely to have inherent complexities, as indicated by DOE's repeal of the active mode test procedure, and not considering active mode in the definition of covered products will only add to those complexities. AHAM stated that DOE should address this issue now and would work with DOE to determine how the differences between microwave-only ovens, over-the-range microwave ovens, and combination ovens should be addressed. (AHAM, No. 31 at p. 2)⁴ Whirlpool Corporation (Whirlpool) supported the comments made by AHAM. (Whirlpool, No. 30 at p. 1)

As discussed above, DOE will evaluate the suitability of separate provisions for measuring the active mode energy use of different heating components or other product features related to installation configuration when considering future amendments to the microwave oven test procedure to address active mode. DOE may consider at that time whether amendments to the definition of "microwave oven" are necessary for the development of an active mode test procedure. DOE also notes that it makes determinations regarding the scope of covered products,

⁴ A notation in the form "AHAM, No. 31 at p. 2" identifies a written comment: (1) made by the Association of Home Appliance Manufacturers; (2) recorded in document number 31 that is filed in the docket of the microwave oven test procedures rulemaking (Docket No. EERE-2008-BT-TP-0011) and available for review at www.regulations.gov; and (3) which appears on page 2 of document number 31.

including potential grouping in product classes, in the energy conservation standards rulemaking process. As discussed in the March 2011 Interim Final Rule, under the definition of “microwave oven,” all ovens equipped with microwave capability would be considered covered products, and that for the standby mode and off mode test procedure, the same testing methodology can be used for microwave-only, over-the-range microwave ovens, and combination microwave ovens. 76 FR 12825, 12829–30 (Mar. 9, 2011). For these reasons, DOE is not proposing amendments to the definition of “microwave oven” in 10 CFR 430.2 in today’s SNOPR.

AHAM commented that the determination of covered products in the March 2011 Interim Final Rule is overly broad. AHAM stated that combination ovens are now covered products under the definition of “microwave oven” according to the March 2011 Interim Final Rule, but the adopted test procedure fails to make that clear. AHAM stated that, according to the March 2011 Interim Final Rule, a free-standing range with microwave capability would be excluded, but this is not clear from the definition. AHAM continues to believe that DOE should not consider combination ovens as meeting the definition of “microwave oven,” but that DOE could alternatively clarify the intent to include combination ovens as covered products by defining the term “combination oven.” (AHAM, No. 31 at p. 2) Whirlpool supported the comments made by AHAM. (Whirlpool, No. 30 at p. 1)

Although DOE provided a definition of a combination oven as a microwave oven that incorporates convection features and possibly other means of cooking in the March 2011 Interim Final Rule, it agrees that additional clarity would be gained by codifying a definition. To that end, DOE is proposing to add such a definition of “combination oven” to the definitions in 10

CFR 430.2. DOE further notes that the definition of “microwave oven” adopted in the March 2011 Interim Final Rule specifies that the appliance would consist of a compartment designed to cook or heat food by means of microwave energy and would include combination ovens. However, 10 CFR 430.2 additionally defines a microwave/conventional range as distinct from a microwave oven, although it incorporates a microwave oven along with a conventional oven and conventional cooking top. Because the test procedure applies only to microwave ovens and not to microwave/conventional ranges, a free-standing range with microwave capability in one compartment and a conventional oven in a separate compartment would not be a covered product under this rulemaking. Additionally, a range incorporating a single compartment with microwave capability and other cooking or heating means, along with a conventional cooking top, would not be considered a covered product because the cooking top portion would exclude the range from the relevant portion of the definition of “microwave oven” (e.g., a compartment designed to cook or heat food by means of microwave energy.)

AHAM also commented that, based on DOE’s statement that the definition of combination microwave oven as a covered product does not hinge on which cooking mode is primary (i.e., radiant heating or microwave energy) and that all ovens equipped with microwave capability would be considered a covered product under the March 2011 Interim Final Rule, a product that uses radiant heat for cooking, but also uses microwave energy as a secondary cooking mode, would be covered as a microwave oven as well as a conventional cooking product, and such a product should not be twice regulated. AHAM stated, therefore, that such a product should not be covered by the definition of microwave oven. (AHAM, No. 31 at p. 2) Whirlpool supported the comments made by AHAM. (Whirlpool, No. 30 at p. 1)

DOE defines “conventional oven” as “a class of kitchen ranges and ovens which is a household cooking appliance consisting of one or more compartments intended for the cooking or heating of food by means of either a gas flame or electric resistance heating. It does not include portable or countertop ovens which use electric resistance heating for the cooking or heating of food and are designed for an electrical supply of approximately 120 volts.” 10 CFR 430.2 Because this definition does not provide for the option of cooking or heating food by means of microwave energy, DOE concludes that a product comprising a single compartment that uses both radiant heat and microwave energy for cooking would be covered only under the definition of “microwave oven,” which includes combination microwave ovens (including those with radiant heating elements) regardless of which is considered the primary cooking mode, and would not be covered as a conventional cooking product.

DOE acknowledges that the definition of “microwave oven” considers only a single compartment, while the definition of “conventional oven” allows for the possibility of one or more compartments. DOE believes that, for products that consist of multiple oven compartments but no integral cooking top portion, the compartment(s) that provide for cooking by means of microwave energy in combination with any other cooking or heating means would be classified as microwave ovens, while the compartment(s) that cook or heat food by means of a gas flame or electric resistance heating without the use of microwave energy would be classified as conventional ovens.

DOE notes that its regulations contain certain provisions allowing a manufacturer to seek

a waiver from the test procedure requirements for covered consumer products if at least one of the following conditions is met: (1) The petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedure, or (2) when the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(a)(1). Petitioners must include in their petition any alternative test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption characteristics. 10 CFR 430.27(b)(1)(iii). The Assistant Secretary for Energy Efficiency and Renewable Energy may grant a waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(l). Waivers remain in effect pursuant to the provisions of 10 CFR 430.27(m).

As discussed in section III.B, the amendments to the DOE microwave oven test procedure codified in the CFR would clarify that the procedures and calculations adopted in the final rule need not be performed to determine compliance with energy conservation standards, until compliance with any final rule establishing amended energy conservation standards for microwave ovens in standby mode and off mode is required. At that time, any application for waiver from the test procedure may be submitted. As noted in section I, DOE is currently conducting an energy conservation standards rulemaking to address microwave oven standby power consumption. DOE also notes that determinations as to whether certain products are considered covered under DOE's regulations are made in the energy conservation standards rulemaking.

AHAM commented that it opposes the inclusion of thermal elements designed for surface browning in the definition of microwave ovens. AHAM noted DOE repealed the active mode test procedure for microwave ovens because DOE determined it was not repeatable or reproducible and by including microwave ovens with thermal elements in the definition of microwave ovens, that same unworkable situation would be created here. According to AHAM, there is currently no repeatable and reproducible test procedure for microwave ovens with thermal elements, and those units with thermal elements may use different amounts of energy than units with microwave-only capability. In addition, AHAM commented that there are no agreed-upon definitions as to what constitutes “browning.” AHAM urged DOE to not include thermal elements designed for surface browning in the definition of “microwave oven.” (AHAM, No. 31 at pp. 2-3) Whirlpool supported the comments made by AHAM. (Whirlpool, No. 30 at p. 1)

As discussed above, DOE may consider amendments to the test procedure to measure the active mode energy use in a separate test procedure rulemaking process, including the methods for measuring the energy use of thermal elements. As discussed in the March 2011 Interim Final Rule, under the definition of “microwave oven,” all ovens equipped with microwave capability would be considered a covered products, including those with thermal elements. 76 FR 12825, 12830 (Mar. 9, 2011). DOE also makes determinations regarding the scope of covered products in the energy conservation standards rulemaking process. As a result, DOE is not proposing amendments to the definition of “microwave oven” in 10 CFR 430.2 to exclude thermal elements designed for surface browning in today’s SNOPR.

AHAM commented that DOE should again consider the differences between countertop microwave ovens and over-the-range microwave ovens, noting there are significant differences both in energy consumption and consumer utility. AHAM noted that countertop microwave ovens are typically designed for room temperature ambient conditions, whereas over-the-range microwave ovens must be designed to withstand the higher temperatures above a range. AHAM commented that features such as the display require more energy for over-the-range microwave ovens to withstand the higher temperatures, and that Vacuum Fluorescent Displays (VFDs) are used more often in such units because of their reliability at higher temperatures, but require higher current to operate in both active and standby modes. AHAM noted that countertop microwave ovens can use lower-power Light Emitting Diode (LED) displays due to the lower ambient temperatures. AHAM added that other energy-using features typically exist only in over-the-range microwave ovens, such as air venting and circulation, forced cooling, and cooktop lighting. (AHAM, No. 31 at p. 3) Whirlpool supported the comments made by AHAM. (Whirlpool, No. 30 at p. 1)

As discussed in the March 2011 Interim Final Rule, DOE did not identify during its research and testing any different standby or off modes for over-the-range microwave-only and combination microwave ovens as compared to countertop microwave-only units. DOE noted that differences in energy use, installation configurations, and heating features between countertop and over-the-range configurations that may warrant different product classes would be evaluated as part of the energy conservation standards rulemaking addressing standby mode and off mode for microwave ovens. 76 FR 12825, 12829–30 (Mar. 9, 2011). DOE may consider the suitability of separate provisions for over-the-range microwave ovens to measure the energy performance

of active mode features such as air venting and circulation, forced cooling, and cooktop lighting when considering future active mode test procedure amendments.

Intirion Corporation (Intirion) commented that its product—an integrated microwave oven, refrigerator/freezer, and two charging stations (“MicroFridge”)—should not be considered a covered product under the proposed energy conservation standards for microwave oven standby power and should be considered exempt from the standard. (Intirion, No. 29 at p. 1) Intirion commented that the MicroFridge should be considered a combination appliance which, according to Intirion, is significantly different from a typical microwave oven. Intirion also noted that, although the MicroFridge can either be shipped as a pre-assembled combination appliance or as a separate unit (with the consumer attaching the microwave oven and refrigerator/freezer on-site), the intention of the MicroFridge is to be used as a combination appliance. (Intirion, No. 29 at pp. 1–2) The MicroFridge allows the consumer to power a microwave oven, refrigerator/freezer, and charging stations from a single outlet. Intirion commented that the microwave oven controller in the MicroFridge also manages electrical flow for the microwave oven, refrigerator/freezer, and charging stations to prevent the electrical circuit from overloading. When the microwave oven is in use, the electrical flow to the charging stations and refrigerator are turned off. (Intirion, No. 29 at p. 2) Intirion further commented that when considering the microwave oven exclusive of the charging stations and refrigerator electrical management, the microwave oven LED clock display and microcontroller consume 2 watts (W) in standby mode.⁵ (Intirion, No. 29 at pp. 2–3) Intirion requested that DOE issue a waiver for the MicroFridge

⁵ Aside from the microwave oven LED display and microcontroller, Intirion noted that the Microfridge consumes 0.2W for 2 front green LED lamps, 0.5W each for two front outlets, and 0.5W for a rear outlet. The total standby power of the MicroFridge is thus 3.7W.

microwave oven from the proposed energy conservation standards for microwave oven standby power because its characteristics make the standby power standards not applicable, and a waiver should be granted. (Intirion, No. 29 at p. 4)

In response, as discussed above for products that consist of multiple oven compartments but no integral cooking top portion, DOE notes that its regulations contain certain provisions allowing a manufacturer to seek a waiver from the test procedure requirements for covered consumer products if at least one of the following conditions is met: (1) The petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedure, or (2) when the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(a)(1). DOE also notes that determinations as to whether certain products are considered covered under DOE's regulations are made in the energy conservation standards rulemaking.

B. Effective Date for the Test Procedure and Date on which Use of the Test Procedure Would be Required

The effective date of the standby and off mode test procedures for microwave ovens would be 30 days after the date of publication of the final rule. DOE's amended test procedure regulations codified in the CFR would clarify, though, that the procedures and calculations adopted in the final rule need not be performed to determine compliance with energy conservation standards, until compliance with any final rule establishing amended energy conservation standards for microwave ovens in standby mode and off mode is required.

However, as of 180 days after publication of the 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))

C. Incorporation of IEC Standard 62301 (Second Edition)

As noted above, EPCA, as amended by EISA 2007, requires that test procedures be amended to include standby mode and off mode energy consumption, taking into consideration the most current versions of IEC Standards 62301 and 62087. (42 U.S.C. 6295(gg)(2)(A)) The March 2011 Interim Final Rule incorporated in the test procedures for microwave ovens relevant provisions from IEC Standard 62301 (First Edition) for measuring standby mode and off mode power. DOE reviewed the IEC Standard 62301 (First Edition) and concluded that it would be generally applicable to microwave ovens, although some clarification would be needed. Specifically, DOE adopted a specific standby mode power measurement methodology for units in which power varies as a function of displayed time. 76 FR 12825, 12837–12840 (Mar. 9, 2011). With these clarifications in place, the March 2011 Interim Final Rule referenced IEC Standard 62301 (First Edition) for the standby mode and off mode wattage measurements.

DOE noted in the March 2011 Interim Final Rule that there were significant differences between IEC Standard 62301 (First Edition) and IEC Standard 62301 (FDIS), which was the latest draft version of IEC Standard 62301 (Second Edition) available during the drafting of the interim final rule. *Id.* at 12832–33. For example, IEC Standard 62301 (FDIS) clarified certain provisions, such as the definition of “standby mode” and “off mode” to allow for the

measurement of multiple standby power modes. IEC Standard 62301 (FDIS) incorporated responses to comments from multiple national committees from member countries on several previous draft versions, and thus, DOE believed, it provided the best available mode definitions. Id. After considering both versions of IEC Standard 62301 (i.e., First Edition and FDIS), DOE concluded in the March 2011 Interim Final Rule that the definitions of “standby mode,” “off mode,” and “active mode” provided in IEC Standard 62301 (FDIS) were more useful, in that they expanded upon the EPCA mode definitions and provided additional guidance as to which functions would be associated with each mode. Therefore, DOE adopted the definitions of “standby mode,” “off mode,” and “active mode” based on the definitions provided in IEC Standard 62301 (FDIS) in the March 2011 Interim Final Rule. Id. at 12836.

DOE noted in the March 2011 Interim Final Rule that IEC published the final version of IEC Standard 62301 (Second Edition) on January 27, 2011, too late to be incorporated into the rulemaking. DOE also noted that significant changes in the methodology of IEC Standard 62301 were first introduced only at the IEC Standard 62301 (FDIS) stage. DOE noted that those changes had not been, at that time, the subject of significant public comment from interested parties, nor had DOE had the opportunity to conduct a thorough analysis of those provisions. Id. at 12833. Given the pending statutory deadline for issuance of a microwave oven standard and the recent adoption of IEC Standard 62301 (Second Edition), DOE decided to base the test procedure amendments in the March 2011 Interim Final Rule (other than the mode definitions) on the provisions of IEC Standard 62301 (First Edition). Id.

In response to the March 2011 Interim Final Rule, AHAM commented that DOE should

incorporate by reference IEC Standard 62301 (Second Edition) as published. AHAM also commented that all of the provisions incorporated by reference should be from IEC Standard 62301 (Second Edition) and not reference sections from both IEC Standard 62301 (First Edition) and IEC Standard 62301 (Second Edition), including any draft versions. AHAM noted that the Second Edition has been vetted through an extensive consensus method of standards development that includes dozens of countries. AHAM also noted that IEC Standard 62301 (Second Edition) contains a number of important clarifications not present in the First Edition. AHAM commented that incorporation by reference of the Second Edition will allow for optimum international harmonization, which gives clarity and consistency to the regulated community, and also significantly decreases the testing burden on manufacturers. AHAM stated that if DOE maintains its incorporation by reference of IEC Standard 62301 (First Edition), regulated parties would have to test products under one test procedure in the United States and a different procedure in other countries, adding significant testing burden. (AHAM, No. 31 at pp. 3–4; AHAM, DOE-HQ-2011-0014, No. 10 at pp. 3–4⁶) Whirlpool supported the comments made by AHAM. (Whirlpool, No. 30 at p. 1)

As discussed in section I, DOE published the March 2011 Interim Final Rule to provide an opportunity for it to fully consider whether any changes should be made in light of publication of IEC Standard 62301 (Second Edition). DOE agrees with the commenters that IEC Standard 62301 (Second Edition) is an internationally-accepted test procedure for measuring standby

⁶ A notation in the form “AHAM, DOE-HQ-2011-0014, No. 10 at pp. 3–4” identifies a written comment: (1) made by AHAM; (2) recorded in document number 10 that is filed in the docket of the Request for Information on reducing regulatory burden (Docket No. DOE-HQ-2011-0014) and available for review at www.regulations.gov; and (3) which appears on pages 3 through 4 of document number 10.

power in residential appliances, and that it provides clarification to certain sections as compared to the First Edition, as discussed in the following paragraphs.

Section 4, paragraph 4.4 of the Second Edition revises the power measurement accuracy provisions of the First Edition. A more comprehensive specification of required accuracy is provided in the Second Edition, which depends upon the characteristics of the power being measured. Testers using the Second Edition are required to measure the crest factor and power factor of the input power, and to calculate a maximum current ratio (MCR) (paragraph 4.4.1 of the Second Edition). The Second Edition then specifies calculations to determine permitted uncertainty in MCR. DOE notes, however, that the allowable uncertainty is the same or less stringent than the allowable uncertainty specified in the First Edition, depending on the value of MCR and the power level being measured (see Table III.1 for examples). This change in the allowable uncertainty, however, maintains sufficient accuracy of measurements under a full range of possible measured power levels without placing undue demands on the instrumentation. These power measurement accuracy requirements were based upon detailed technical submissions to the IEC in the development of IEC Standard 62301 (FDIS), which showed that commonly-used power measurement instruments were unable to meet the original requirements for certain types of loads. Therefore, DOE believes that the incremental testing burden associated with the additional measurements and calculations is offset by the more reasonable requirements for testing equipment, while maintaining measurement accuracy deemed acceptable and practical by voting members for IEC Standard 62301 (Second Edition). For these reasons, DOE proposes in today's supplemental notice to incorporate by reference in 10 CFR part 430, subpart B,

appendix I, section 2.9.1.3 the power equipment specifications in section 4, paragraph 4.4 of IEC Standard 62301 (Second Edition).

Table III.1 Comparison of Allowable Uncertainty in Measured Power

Measured Power (W)	Allowable Uncertainty (W)		
	IEC 62301 (First Edition)	IEC 62301 (Second Edition)	
		MCR = 5	MCR = 15
5.0	0.1	0.1	0.14
2.0	0.04	0.04	0.056
1.0	0.02	0.02	0.028
0.5	0.01	0.02	0.02
0.2	0.01	0.02	0.02

DOE notes that section 5, paragraph 5.2 of IEC Standard 62301 (Second Edition) maintains the installation and setup procedures incorporated by reference in the microwave oven test procedure in the March 2011 Interim Final Rule from the First Edition. These provisions require that the appliance be prepared and set up in accordance with manufacturer’s instructions, and that if no instructions are given, then the factory or “default” settings shall be used, or where there are no indications for such settings, the appliance is tested as supplied. Additionally, IEC Standard 62301 (Second Edition) adds certain clarifications to the installation and setup procedures in section 5, paragraph 5.2 of the First Edition regarding products equipped with a battery recharging circuit for an internal battery, as well as instructions for testing each relevant configuration option identified in the product’s instructions for use. DOE is not aware of any microwave oven with an internal battery, or with a recharging circuit for such a battery. DOE also believes that a requirement to separately test each configuration option could substantially increase test burden and potentially conflicts with the requirement within the same section to set up the product in accordance with the instructions for use or, if no such instructions are available,

to use the factory or “default” settings. Therefore, DOE tentatively concludes that the portions of the installation instructions in section 5, paragraph 5.2 of IEC Standard 62301 (Second Edition) pertaining to batteries and the requirement for the determination, classification, and testing of all modes associated with every combination of available product configuration options (which may be more numerous than the modes associated with operation at the default settings) are not appropriate for the microwave oven test procedures. Accordingly, DOE is proposing qualifying language in the test procedure amendments at 10 CFR part 430, subpart B, appendix I, section 2.1.3 to disregard those portions of the installation instructions.

The Second Edition also contains provisions for the power supply (section 4.3) and power-measuring instruments (section 4.4). Paragraph 4.3.2 requires that the value of the harmonic content of the voltage supply be recorded during the test and reported. As described previously, paragraph 4.4.1 requires the instrument to measure the crest factor and maximum current ratio. Paragraph 4.4.3 requires the instrument to be capable of measuring the average power or integrated total energy consumption over any operator-selected time interval. DOE is aware of commercially available power measurement instruments that can perform each of these required measurements individually. However, DOE is also aware that certain industry-standard instruments, such as the Yokogawa WT210/WT230 digital power meter and possibly others, are unable to measure harmonic content or crest factor while measuring average power or total integrated energy consumption. DOE is concerned that laboratories currently using power-measuring instruments without this capability would be required to purchase, at potentially significant expense, additional power-measuring instruments that are able to perform all these measurements simultaneously. Therefore, DOE proposes in 10 CFR part 430, subpart B,

appendix I, sections 2.2.1.2 and 2.9.1.3 that if the power-measuring instrument is unable to perform these measurements during the actual test measurement, it would be acceptable to measure the total harmonic content, crest factor, and maximum current ratio immediately before and immediately after the actual test measurement to determine whether the requirements for the power supply and power measurement have been met. DOE requests comment on whether this represents an acceptable interpretation of the power measurement requirements of the Second Edition.

The other major changes in the Second Edition related to the measurement of standby mode and off mode power consumption in covered products involve measurement techniques and specification of the stability criteria required to measure that power. The Second Edition contains more detailed techniques to evaluate the stability of the power consumption and to measure the power consumption for loads with different stability characteristics. According to the Second Edition, the user is given a choice of measurement procedures, including sampling methods, average reading methods, and a direct meter reading method. DOE evaluated these new methods in terms of test burden and improvement in results as compared to those methods adopted in the March 2011 Interim Final Rule, which were based on IEC Standard 62301 (First Edition).

In the March 2011 Interim Final Rule, DOE adopted provisions requiring that microwave oven standby mode and off mode power be measured using section 5, paragraph 5.3 of IEC Standard 62301 (First Edition). DOE also adopted additional specific methodology for microwave ovens in which power varies as a function of the time displayed. In particular, based

on DOE's testing, DOE adopted a requirement for these microwave ovens to set the display time to 3:23 and allowing a 10-minute stabilization period prior to a 10-minute measurement period for the display time of 3:33 to 3:42, based on the average power approach of section 5, paragraph 5.3.2(a) of IEC Standard 62301 (First Edition). DOE stated that this method provides a valid measure of standby energy use for those microwave ovens with power consumption varying according to the time displayed on the clock. 76 FR 12825, 12838–40 (Mar. 9, 2011).

For today's supplemental notice, to determine the potential impacts of referencing methodology from IEC Standard 62301 (Second Edition) rather than from the First Edition, DOE compared the provisions allowed by each under different scenarios of power consumption stability, as discussed in the following sections.

1. Stable Power Consumption

According to section 5, paragraph 5.3.1 of IEC Standard 62301 (First Edition), after an initial stabilization period of 5 minutes, power consumption is defined as stable if it varies by less than 5 percent over a subsequent measurement period of 5 minutes. In such a case, a direct reading may be made at the end of the measurement period. Based on this methodology, which was adopted in the March 2011 Interim Final Rule for microwave ovens other than units in which power varies as a function of displayed time, the total test time would be at minimum 10 minutes (comprised of a minimum 5-minute stabilization period, followed by a minimum 5-minute period during which the stability criterion could be evaluated and a direct power reading taken.) Alternatively, the tester may select an average power or accumulated energy approach,

again with a minimum 5-minute measurement period. The average power approach would simply require a different reading to be taken from the instrument (true average power instead of a direct reading of instantaneous power), while the accumulated energy approach would require the calculation of power by dividing the accumulated energy by the duration of the measurement period.

In comparison, section 5, paragraph 5.3.4 of IEC Standard 62301 (Second Edition) specifies a direct meter reading method that can be used for stable power consumption, in which a minimum 30-minute stabilization period must be observed, followed by a first power measurement. After an additional period of 10 minutes, a second power measurement is taken. If the average of the two measurements divided by the time interval between them meets certain threshold criteria, then the power consumption is considered to be the average of the two power measurements. Thus, the total test period would still be at minimum 40 minutes. DOE agrees that this method likely improves the validity of the test results, as it is a more stringent measure of the stability of the power consumption over a longer period of time than the First Edition requires. However, if the threshold criteria are not met at the end of the test, a different measurement method must be used, increasing test time and complexity. Further, the Second Edition specifies that the direct reading method shall not be used for verification purposes. Both of these qualifications potentially increase test burden as compared to the First Edition, possibly requiring the tester to conduct the more complex methodology of the methods available under the Second Edition.

DOE notes that section 5, paragraph 5.3.2 of IEC Standard 62301 (Second Edition) identifies a sampling method as the preferred means for all power consumption measurements and the fastest test method when the power is stable. For any non-cyclic power consumption, power readings are initially recorded over a period of at least 15 minutes after energizing the product. Data from the first third of the measurement period are discarded, and stability is evaluated by a linear regression through all power readings in the second two-thirds of the data. If the slope of the linear regression is less than 10 milliwatts per hour (mW/h) for input power less than or equal to 1.0 W, or less than 1 percent of the input power per hour for input power greater than 1.0 W, the power consumption is calculated as the average of the power readings during the second two-thirds of the measurement period. If the slope of the linear regression does not meet these stability criteria, the total period is continuously extended until the stability criteria are met for the second two-thirds of the data. In some cases, this is a more stringent requirement than the stability criteria of IEC Standard 62301 (First Edition). The lack of a definitive test period means that the test duration could extend past 15 minutes for certain products—up to 3 hours is allowed in the Second Edition—and could introduce added test burden as compared to the First Edition.

2. Unstable, Non-Cyclic Power Consumption

Section 5, paragraph 5.3 from IEC Standard 62301 (First Edition), which DOE incorporated by reference in the microwave oven test procedure in the March 2011 Interim Final Rule with clarification, specifies that either an average power method or accumulated energy approach could be used for measuring non-cyclic unstable power consumption. As described

previously, this methodology, as adopted in the March 2011 Interim Final Rule, would limit total test duration to 10 minutes.

In contrast, the Second Edition requires the use of either a sampling method or average reading method for measuring power consumption in standby mode or off mode. The sampling method is the same as described previously, but the measurement period must be at least 60 minutes, and the cumulative average of all data points recorded during the second two-thirds of the total period must fall within a band of ± 0.2 percent.

The average reading method in section 5, paragraph 5.3.3 IEC Standard 62301 (Second Edition) comprises both an average power method and accumulated energy method, either of which may be selected for unstable, non-cyclic power. For both methods, a 30-minute stabilization period is specified, followed by two comparison measurement periods of not less than 10 minutes each. The average power values, either measured directly or calculated from accumulated energy during each period, are compared to determine whether they agree to within certain threshold criteria. If the threshold is not achieved, the comparison periods are each extended in approximately equal increments until the threshold is met. If agreement is not achieved after reaching 30 minutes for each comparison period, the sampling method must then be used. Therefore, the minimum test period is 50 minutes, but may extend up to 90 minutes, at which time an additional test may be required.

DOE believes that the stability criteria in either method improves the accuracy and representativeness of the measurement as compared to the First Edition, but would cause the

required test time to increase (potentially quite significantly), with a corresponding increase in manufacturer burden due to the additional time and complexity of the test conduct.

3. Cyclic Power Consumption

The average power approach of section 5, paragraph 5.3.2(a) in IEC Standard 62301 (First Edition) requires a measurement period of not less than 5 minutes and that at least one or more complete cycles be measured. For microwave ovens in which standby mode power consumption varies as a function of displayed time, DOE adopted in the March 2011 Interim Final Rule a requirement to set the display time to 3:23 and allowing a 10-minute stabilization period prior to a 10-minute measurement period from the display time of 3:33 to 3:42, as described previously, based on the average power approach of section 5, paragraph 5.3.2(a) of IEC Standard 62301 (First Edition). This test method requires a minimum of 20 minutes to conduct.

Under section 5, paragraph 5.3.2 of the Second Edition, testers would be required to use the sampling method for microwave ovens that consume varying power as a function of the displayed time due to the cyclic nature of this power consumption. This method specifies a measurement period of at least four complete cycles (for a total of at least 40 minutes) divided into two comparison periods, with stability criteria evaluated by calculating the difference in average power measured in each comparison period divided by the time difference of the mid-point of each comparison period. Similar to the sampling method for stable power consumption measurements described previously, this “slope” must be less than 10 mW/h for input powers less than or equal to 1 W, and less than 1 percent of the input power per hour for input powers

greater than 1 W. If the appropriate stability criterion is not met, additional cycles are added to each comparison period until the criterion is achieved. Once stability has been reached, the power consumption is calculated as the average of all readings from both comparison periods. Because all of the clock displays which DOE observed to be incorporated in microwave ovens are based on a 12-hour cycle, such a product which consumes varying power as a function of the displayed time would be required under the Second Edition to be tested for a minimum of 4 cycles, or 48 hours, in addition to an initial stabilization period of not less than 10 minutes. DOE notes that this test duration would impose a greatly increased test burden on manufacturers, particularly in comparison to the adopted 10-minute methodology.

4. Product Testing

In order to further evaluate the test methodology of IEC Standard 62301 (Second Edition), DOE conducted testing on a representative sample of 26 microwave ovens. DOE conducted tests according to the sampling method in section 5, paragraph 5.3.2 of IEC Standard 62301 (Second Edition), in some cases repeating the tests to evaluate reproducibility. The results from testing, presented in Table III.2, show that, for the test units that had stable, non-cyclic power consumption, the test duration ranged from 15 minutes to 25 minutes, with an average of approximately 17 minutes. The majority of test units required the minimum test duration of 15 minutes. For units that showed a stable, cycle power consumption, DOE used the methodology adopted in the March 2011 Interim Final Rule, setting the clock display to 3:23 and allowing a 10-minute stabilization period prior to a 10-minute measurement period for the display time of 3:33 to 3:42.

Table III.2 DOE Standby Mode Test Duration Using IEC Standard 62301 (Second Edition) Sampling Method

Test Unit	Product Type	Display Type	Power Measurement Method (Using Sampling Method)	Test 1 Duration (min)	Test 2 Duration (min)
1	Countertop Microwave-Only	LED	Stable, Cyclic	20	
2	Countertop Microwave-Only	LED	Stable, Cyclic	20	
3	Countertop Microwave-Only	VFD	Stable, Non-Cyclic	15	15
4	Countertop Microwave-Only	LED	Stable, Cyclic	20	20
5	Countertop Microwave-Only	LCD	Stable, Non-Cyclic	15	
6	Countertop Microwave-Only	LCD	Stable, Non-Cyclic	15	
7	Countertop Microwave-Only	LCD	Stable, Non-Cyclic	15	15
8	Countertop Microwave-Only	LCD	Stable, Non-Cyclic	15	
9	Countertop Microwave-Only	VFD	Stable, Non-Cyclic	25	16
10	Countertop Microwave-Only	VFD	Stable, Non-Cyclic	15	
11	Countertop Combination	VFD	Stable, Non-Cyclic	18.75	15
12	Countertop Combination	VFD	Stable, Non-Cyclic	15	15
13	Countertop Combination	VFD	Stable, Non-Cyclic	15	
14	Countertop Combination	VFD	Stable, Non-Cyclic	15	
15	Countertop Combination	LCD	Stable, Non-Cyclic	23.75	22.5
16	Countertop Combination	VFD	Stable, Non-Cyclic	15	15
17	Countertop Combination	LED	Stable, Cyclic	20	20
18	Countertop Combination	VFD	Stable, Non-Cyclic	15	
19	Over-the-Range Microwave Only	VFD	Stable, Non-Cyclic	15	15
20	Over-the-Range Microwave Only	VFD	Stable, Non-Cyclic	23.125	
21	Over-the-Range Microwave Only	VFD	Stable, Non-Cyclic	15	
22	Over-the-Range Microwave Only	VFD	Stable, Non-Cyclic	15	
23	Over-the-Range Microwave Only	LCD	Stable, Non-Cyclic	15	15
24	Over-the-Range Microwave Only	LED	Stable, Cyclic	20	
25	Over-the-Range Microwave Only	VFD	Stable, Non-Cyclic	15	
26	Over-the-Range Combination	VFD	Stable, Non-Cyclic	15	15
Average Test Duration				17.0	

5. Conclusions on Test Methodology

DOE, in evaluating IEC Standard 62301 (Second Edition) in comparison to the First Edition, confers substantial weight to the considerable body of comments on and input to the provisions and methodology that IEC developed as part of its latest revision process. DOE

recognizes that, in some cases, test burden and complexity would be increased by requiring the use of the test methods specified in the Second Edition. However, DOE believes that in most cases, this added burden on manufacturers has been sufficiently considered by the IEC voting members as being outweighed by the improved accuracy and representativeness of the resulting power consumption measurement. Furthermore, manufacturers were aware of these differences, but nevertheless overwhelmingly supported DOE's use of the Second Edition. In addition, according to AHAM, harmonizing with international test standards will reduce testing burden on microwave oven manufacturers that sell products internationally by not requiring multiple standby tests to be conducted according to different testing methods in different countries. DOE tentatively concludes that the application of the provisions of the Second Edition to power measurements in off mode and most standby modes would be appropriate, and is proposing incorporation by reference of the relevant paragraphs of section 5.3 of IEC Standard 62301 (Second Edition) in the test procedures for these products in 10 CFR part 430, subpart B, appendix I, sections 3.1.3.1 and 3.2.3.

Further, DOE observes that although the Second Edition allows the choice of multiple test methods for both stable and unstable non-cyclic power consumption, the sampling method provides for a test duration that is approximately the same or similar to the allowable alternative methods and does not require classification of the nature of the power consumption (e.g., stable or unstable, non-cyclic) in advance of the test. By monitoring the variation in power consumption during the test, the test operator could determine whether it is stable or unstable, and thereby establish the required duration of the sampling periods. For cyclic power consumption, the Second Edition also requires the use of the sampling method. Thus, DOE

proposes to require in 10 CFR part 430, subpart B, appendix I, sections 3.1.3.1 and 3.2.3 the use of the sampling method in section 5.3.2 of the Second Edition for standby mode and off mode power measurements, except as follows. In the narrow case of microwave ovens with power consumption that varies as a function of the time displayed, DOE tentatively concludes that the application of the test methodology from the Second Edition would cause manufacturers to incur significant burden that would not be warranted by any potential improved accuracy of the test measurement. For this reason, DOE is not proposing in this supplemental notice to amend the substance of the 10-minute test method that is currently provided for these products in the microwave oven test procedure.

This supplemental notice is also proposing to amend the reference in 10 CFR 430.3 to add a reference to IEC Standard 62301 (Second Edition). DOE is not proposing to delete the reference to the First Edition in 10 CFR 430.3 because the proposed amendments in today's supplemental notice would continue to incorporate certain provisions from it as well as from the Second Edition.

DOE also notes that there are a number of editorial changes necessary in appendix I to allow for the correct referencing to the Second Edition. For example, the definition sections need to define the IEC Standard 62301 as the Second Edition instead of the First Edition. Also, there are some section numbering differences in the Second Edition which impact the text of the measurement provisions of the relevant test procedures.

D. Definitions of “Active Mode,” “Standby Mode,” and “Off Mode”

In the March 2011 Interim Final Rule, DOE adopted a definition of “standby mode” based on the definitions provided in IEC Standard 62301 (FDIS), as follows:

- “Standby mode” is the condition in which an 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 remote switch (including remote control), internal sensor, or timer to facilitate the activation of other modes (including activation or deactivation of active mode);
- and continuous functions, including information or status displays (including clocks) or sensor-based functions. 76 FR 12825, 12834 (Mar. 9, 2011).

DOE also adopted in its amendments to the test procedure the clarification, provided as a note accompanying the definition of standby mode in IEC Standard 62301 (FDIS), that a timer is a continuous clock function (which may or may not be associated with a display) that provides regularly scheduled tasks (e.g. switching) and that operates on a continuous basis. Id.

DOE also adopted definitions of “off mode” and “active mode” based on the definitions provided in IEC Standard 62301 (FDIS), as follows:

- “Off mode” is the condition in which an 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. An indicator that only shows the user that the

product is in the off position is included within the classification of off mode. Id.

- “Active mode(s)” is the condition in which an energy-using product is connected to a mains power source and at least one primary function is activated. Id.

AHAM commented that it supported DOE’s proposal to adopt definitions of standby mode, off mode, and active mode based on the definitions provided in IEC Standard 62301 (FDIS), except that because the definitions in the FDIS version are identical to those in the published version of IEC Standard 62301 (Second Edition), DOE should cite the Second Edition rather than the FDIS version. (AHAM, No. 31 at p. 4) DOE notes that it did not incorporate by reference the definitions of standby mode, off mode, and active mode from IEC Standard 62301 (FDIS) in the March 2011 Interim Final Rule, but instead adopted definitions based on those definitions. 76 FR 12825, 12836 (Mar. 9, 2011). DOE agrees that the definitions in IEC Standard 62301 (FDIS) are identical to the definitions in IEC Standard 62301 (Second Edition). As a result, DOE does not believe it is necessary to propose amendments to the definitions of standby mode, off mode, and active mode in 10 CFR part 430, subpart B, appendix I, section 1, that were adopted in the March 2011 Interim Final Rule based on these comments because these definitions have the same functional equivalence to those in both IEC Standard 62301 (FDIS) and IEC Standard 62301 (Second Edition). However, DOE proposes in today’s SNOPR to make non-substantive editorial changes to clarify for the reader the description of the user-oriented or protective functions associated with standby mode operation in the definition of standby mode in 10 CFR part 430, subpart B, appendix I, section 1.13.

DOE noted in the March 2011 Interim Final Rule that the definition of standby mode states that it includes user-oriented or protective functions to facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer. DOE stated that if the product is consuming energy to power an infrared sensor used to receive signals from a remote control (while not operating in the active mode), such a function would be considered part of standby mode, regardless of whether the remote is classified as “one-way” or “two-way,” because of the function to facilitate the deactivation of another mode by remote switch (including remote control), internal sensor, or timer. However, if a “one-way” remote control powers the product down, including turning off any infrared sensors to receive signals from a remote control, then the product would be operating in the off mode when it is powered down, given that no other standby mode functions within the product are energized. 76 FR 12825, 12836 (Mar. 9, 2011).

AHAM commented that it does not support including one-way remote controls as a feature under the definition of standby mode. AHAM stated that although EPCA defines standby mode to include activation by remote control, one-way remotes do not meet the intent of the statute. AHAM stated that a standard remote, when it powers a product “off” actually powers the product down, not off, such that it can be turned on again via remote control, and this appropriately falls under standby power. Conversely, AHAM stated that a one-way remote turns the product completely off, including turning off any infrared sensors to receive signals from a remote control, such that it cannot be turned on again through use of the remote. Thus, a one-way remote, unlike a standard remote, does not put the product into a standby mode, but instead puts the product into an off mode when it is powered down, as long as no other standby mode

functions within the product are energized. AHAM stated that currently there are few, if any, one-way remotes in the United States, and that including one-way remotes in the off mode instead of in the standby mode will encourage manufacturers to design products with one-way remotes, which could result in decreased energy use. AHAM commented that DOE should include such a clarification in the definition of standby mode. (AHAM, No. 31 at p. 4)

DOE notes that if a one-way remote control powers the product down, including turning off any infrared sensors to receive signals from a remote control, then such a remote control sensor would not be facilitating the activation of other modes (including activation or deactivation of active mode), as defined under standby mode. DOE believes that the definition of standby mode clearly excludes the condition in which a one-way remote control has powered down the product, including turning off any infrared sensors to receive signals from a remote control, as long as the microwave oven does not have any other standby mode product functions energized. Under those conditions, the microwave oven would not be consuming any energy related to standby mode, and would be considered to be in off mode. As a result, DOE is not proposing amendments to the definition of standby mode in 10 CFR part 430, subpart B, appendix I, section 1 to provide such a clarification in today's SNOPR.

E. Specifications for the Test Methods and Measurements for Microwave Oven Standby Mode and Off Mode Testing

As discussed above in section III.C, for microwave ovens in which standby mode power consumption varies as a function of displayed time, DOE adopted in the March 2011 Interim Final Rule a requirement to set the display time to 3:23 and allowing a 10-minute stabilization

period prior to a 10-minute measurement period from the display time of 3:33 to 3:42 based on the average power approach of section 5, paragraph 5.3.2(a) of IEC Standard 62301 (First Edition). 76 FR 12825, 12838–40 (Mar. 9, 2011). The 10-minute stabilization period was determined based on DOE’s testing, which showed that all microwave ovens in its test sample dropped to the lower power state in less than 10 minutes, DOE stated that a requirement to set the display time to 3:23 and allowing a 10-minute stabilization period prior to a 10-minute measurement period would best balance the need for reproducibility of the test procedure with the burden placed on manufacturers. *Id.* at 12839.

AHAM noted that it commented in response to the July 2010 TP SNO PR that the test procedure should require that the clock be set to 3:33 minus the number of minutes needed to return to the lowest power consumption mode, and that DOE responded in the March 2011 Interim Final Rule by stating that AHAM’s proposal was not sufficiently accurate or repeatable. AHAM commented that it disagrees with DOE’s response. AHAM stated its proposed method provides for a more accurate measurement because the length of time to return to the lowest power consumption mode after setting the clock will vary for each microwave oven due to differences in product design. AHAM stated that it is possible that some products would not reach stabilization in that 10-minute period, and thus the 10-minute method would no longer be an accurate measurement for such products. AHAM added that each manufacturer will be able to determine the amount of time to subtract with minimal additional test burden (as, according to AHAM, all models within a basic model will take the same amount of time to return to the lowest power consumption mode), and, therefore, no stabilization time needs to be specified. (AHAM, No. 31 at p. 5)

AHAM proposed that, as a way of preventing anti-circumvention, DOE should require manufacturers to certify the number of minutes that the unit waits before returning to the lowest power consumption mode. AHAM added that if DOE does require this information, it should be treated as confidential business information. (AHAM, No. 31 at p. 5) Whirlpool supported the comments made by AHAM. (Whirlpool, No. 30 at p. 1)

DOE recognizes the merits of the method suggested by AHAM by allowing flexibility for a manufacturer to shorten or lengthen the test cycle depending on the design of their microwave oven. However, as noted in the March 2011 Interim Final Rule, DOE's testing showed that all microwave ovens in its test sample dropped to the lower-power state in less than 10 minutes. 76 FR 12825, 12839 (Mar. 9, 2011). DOE is unaware of any technical basis for a stabilization period longer than 10 minutes, and DOE believes that including a defined stabilization period will encourage manufacturers to minimize the duration of the stabilization period in their products. DOE also believes that it is important for the test procedure to be repeatable and reproducible, and to minimize burden. DOE notes that independent testing laboratories may not sufficiently understand the control logic to determine the appropriate number of minutes needed to return to the lowest power consumption mode. DOE also notes that a display may dim after a certain period of time, but a manufacturer may design a microwave oven with other features or functions that transition to a lower power consumption mode after a different amount of time that is not easily discernible. As a result, different testing laboratories may use different testing times using such a method. DOE believes that defining a specific stabilization period will increase the reproducibility of testing among laboratories. For these reasons, DOE is not proposing

amendments in 10 CFR part 430, subpart B, appendix I, section 3.1.3.1 to set the time to 3:33 minus the number of minutes needed to return to the lowest power consumption mode for microwave ovens in which standby mode power consumption varies as a function of displayed time.

F. Compliance with Other EPCA Requirements

1. Test Burden

EPCA requires that test procedures 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. Test procedures must also not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

In the March 2011 Interim Final Rule, DOE stated that the amendments it adopted in the microwave oven test procedure incorporate a test standard that is accepted internationally for measuring power consumption in standby mode and off mode (IEC Standard 62301). Based on DOE testing and analysis of IEC Standard 62301 (First Edition), DOE determined that the amendments to the microwave oven test procedure produce standby mode and off mode average power consumption measurements that represent an average use cycle both for cases in which the measured power is stable, as well as for when the measured power is unstable (i.e., varies over a cycle). DOE also stated that because the test methods and equipment that the amendments would require for measuring standby power in microwave ovens do not differ substantially from the test methods and equipment required under the previous test procedure, manufacturers would not be required to make a major investment in test facilities and new equipment and would not

be unduly burdensome to conduct. DOE also noted that the number of units to be tested, according to the sampling requirements in 10 CFR 430.24(i), is reasonable and, in part due to a shorter test duration than previously proposed in the October 2008 TP NOPR, would not substantially add to manufacturer test burden and would allow manufacturers that conduct quality assurance testing on the production line to continue to do so. For these reasons, DOE concluded in the March 2011 Interim Final Rule that the amended test procedure would produce test results that measure the power consumption of a covered product during a representative average use cycle as well as annual energy consumption, and that the test procedure would not be unduly burdensome to conduct. 76 FR 12825, 12840 (Mar. 9, 2011).

Today's supplemental proposed amendments to the DOE test procedures are based on an updated version of IEC Standard 62301, IEC Standard 62301 (Second Edition), which has been the subject of significant review and input from interested parties and, thus, continues to be an internationally accepted test standard for measuring standby mode and off mode power consumption. As discussed in section III.C of this notice, DOE believes that the provisions of IEC Standard 62301 (Second Edition) that it proposes to incorporate by reference through today's SNOPR provide a means to measure power consumption with greater accuracy and repeatability than the provisions from IEC Standard 62301 (First Edition) that were adopted in the March 2011 Interim Final Rule. DOE tentatively concludes that today's proposed amendments would also provide measurements representative of average consumer use of the product under test, even if the test conditions and procedures may not be identical to average consumer use (for example, specified display times). In particular, DOE determined that the abbreviated 10-minute test period for those microwave ovens with power consumption varying

according to the time displayed on the clock, as discussed in section III.C, has been carefully designed and circumscribed in order to attain an overall calculated measurement of the energy consumption during a representative 12-hour use cycle. 76 FR 12825, 12838–40 (Mar. 9, 2011). DOE further believes that the new provisions in the applicable sections of IEC Standard 62301 (Second Edition) improve test results without undue testing burden. DOE acknowledges that certain methods from IEC Standard 62301 (Second Edition) may increase test duration somewhat, but where such an increase was deemed excessive (i.e., for products with clocks that can vary in power consumption as a function of time displayed), DOE retained the method previously adopted in order to mitigate test burden. DOE also believes that the potential for increased test burden in other power consumption measurements is offset by more reasonable requirements for testing equipment, while maintaining measurement accuracy deemed acceptable and practical by voting members for IEC Standard 62301 (Second Edition). DOE also notes that, according to AHAM, harmonizing with international test standards will reduce testing burden on microwave oven manufacturers that sell products internationally by not requiring multiple standby tests to be conducted according to different testing methods in different countries. Thus, DOE tentatively concludes that the amended test procedures newly proposed in today’s SNO PR would produce test results that measure the standby mode and off mode power consumption during representative use, and that the test procedures would not be unduly burdensome to conduct.

2. Certification Requirements

Sections 6299–6305 of EPCA authorize DOE to enforce compliance with the energy and water conservation standards established for certain consumer products. (42 U.S.C. 6299–6305

(consumer products) On March 7, 2011, the Department revised, consolidated, and streamlined its existing certification, compliance, and enforcement regulations for certain consumer products and commercial and industrial equipment covered under EPCA, including microwave ovens. 76 FR 12422. These regulations are codified in 10 CFR 429.23 (conventional cooking tops, conventional ovens, microwave ovens).

The certification requirements for microwave ovens consist of a sampling plan for selection of units for testing and requirements for certification reports. Because there are no existing energy conservation standards for microwave ovens, DOE is not proposing any amendments to the certification reporting requirements for these products. However, because DOE proposes in today's SNOPR to introduce new metrics (standby mode power consumption (P_{SB}) and off mode power consumption (P_{OFF})) for microwave ovens, DOE additionally proposes amended provisions in the sampling plan in 10 CFR 429.23(a)(2)(i) that would include P_{SB} and P_{OFF} .

IV. Procedural Issues and Regulatory Review

DOE has concluded that the determinations made pursuant to the various procedural requirements applicable to the March 2011 Interim Final Rule remain unchanged for this SNOPR. These determinations are set forth in the March 2011 Interim Final Rule. 76 FR 12825, 12840-42 (Mar. 9, 2011).

V. Public Participation

A. Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule before or after the public meeting, but no later than the date provided in the DATES section at the beginning of this proposed rule. Interested parties may submit comments using any of the methods described in the ADDRESSES section at the beginning of this notice.

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

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment.

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

information submitted. For information on submitting CBI, see the Confidential Business Information section below.

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

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

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

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format.

Provide documents that are not secured, written in English and are free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

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

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

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include: (1) A description of the items; (2) whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known by or available from other sources; (4) whether the information has previously been made available to others without obligation concerning its confidentiality; (5) an explanation of the

competitive injury to the submitting person which would result from public disclosure; (6) when such information might lose its confidential character due to the passage of time; and (7) why disclosure of the information would be contrary to the public interest.

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

B. Issues on Which DOE Seeks Comment

Although DOE welcomes comments on any aspect of this proposal, DOE is particularly interested in receiving comments and views of interested parties concerning the following issues:

1. Incorporation of IEC Standard 62301 (Second Edition). DOE invites comment on the adequacy of IEC Standard 62301 (Second Edition) to measure standby mode and off mode power consumption for microwave ovens, and the suitability of incorporating into DOE regulations the following specific provisions from IEC Standard 62301 (Second Edition): section 4 ("General conditions for measurements"), paragraph 4.2, "Test room," paragraph 4.3.2, "Supply voltage waveform," and paragraph 4.4, "Power measuring instruments," and section 5 ("Measurements"), paragraph 5.1, "General," paragraph 5.2 "Preparation of product", and paragraph 5.3.2, "Sampling method." (See section III.C)

2. Measurement of Total Harmonic Distortion. DOE invites comment on the acceptability of measuring the total harmonic content, crest factor, and maximum current ratio before and after

the actual test measurement if the power measuring instrument is unable to perform these measurements during the actual test measurement. (See section III.C)

3. Methods Based on IEC Standard 62301 (First Edition) for Microwave Ovens with Clocks.

DOE welcomes comment on its determination that the provisions of IEC Standard 62301 (Second Edition) would cause manufacturers to incur significant test burden for microwave ovens with power consumption that varies as a function of the time displayed, and the continued proposal of a 10-minute test method of measuring standby mode power for these products in the microwave oven test procedure. (See section III.C)

4. Test Burden. DOE seeks comment on its analysis of the test burden associated with standby mode and off mode testing as proposed in today's SNOPR. (See sections III.C and III.F.1)

VI. Approval of the Office of the Secretary

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

List of Subjects

10 CFR Part 429

Energy conservation, Household appliances, Reporting and recordkeeping requirements.

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 November 17, 2011.

Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

For the reasons stated in the preamble, DOE proposes to amend parts 429 and 430 of title 10 of the Code of Federal Regulations, as set forth below:

**PART 429 -- CERTIFICATION, COMPLIANCE, AND ENFORCEMENT FOR
CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT**

1. The authority citation for part 429 continues to read as follows:

Authority: 42 U.S.C. 6291–6317.

2. Section 429.23 is amended by revising paragraph (a)(2)(i) introductory text to read as follows:

§ 429.23 Conventional cooking tops, conventional ovens, microwave ovens.

(a) * * *

(2) * * *

(i) Any represented value of estimated annual operating cost, energy consumption, standby mode power consumption, off mode power consumption, or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

* * * * *

PART 430--ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

3. The authority citation for part 430 continues to read as follows:

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

4. Section 430.2 is amended by adding the definition for “Combination oven” in alphabetical order to read as follows:

§ 430.2 Definitions.

* * * * *

Combination oven means a microwave oven that incorporates convection features and possibly other means of cooking.

* * * * *

5. Section 430.3 is amended by adding paragraph (1)(2) to read as follows:

§ 430.3 Materials incorporated by reference.

* * * * *

(1) * * *

(2) IEC Standard 62301 (“IEC 62301”), Household electrical appliances—
Measurement of standby power (Edition 2.0, 2011-01), IBR approved for Appendix I.

* * * * *

6. Appendix I to Subpart B of Part 430 is amended:

a. By revising the note after the heading;

- b. By revising section 1. Definitions;
- c. In section 2. Test Conditions, by revising sections 2.1.3, 2.2.1.2, 2.5.2, 2.6, and 2.9.1.3; and
- d. In section 3. Test Methods and Measurements, by revising sections 3.1.1, 3.1.1.1, 3.1.2, 3.1.3, and 3.2.3.

The revisions read as follows:

Appendix I to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Conventional Ranges, Conventional Cooking Tops, Conventional Ovens, and Microwave Ovens

Note: The procedures and calculations in this Appendix need not be performed to determine compliance with energy conservation standards for conventional ranges, conventional cooking tops, conventional ovens, and microwave ovens at this time. However, any representation related to standby mode and off mode energy consumption of these products made after *[date 180 days after date of publication of the test procedure final rule in the **Federal Register**]* must be based upon results generated under this test procedure, consistent with the requirements of 42 U.S.C. 6293(c)(2). After July 1, 2010, however, when DOE adopts an energy conservation standard that incorporates standby mode and off mode energy consumption, and upon the compliance date for such standards, compliance with the applicable provisions of this test procedure will also be required. Future revisions may add relevant provisions for measuring active mode in microwave ovens.

1. Definitions

1.1 Active mode means a mode in which a conventional cooking top, conventional oven, conventional range, or microwave oven is connected to a mains power source, has been activated, and is performing the main function of producing heat by means of a gas flame, electric resistance heating, or microwave energy. Delay start mode is a one off user-initiated short duration function that is associated with an active mode.

1.2 Built-in means the product is supported by surrounding cabinetry, walls, or other similar structures.

1.3 Drop-in means the product is supported by horizontal surface cabinetry.

1.4 Forced convection means a mode of conventional oven operation in which a fan is used to circulate the heated air within the oven compartment during cooking.

1.5 Freestanding means the product is not supported by surrounding cabinetry, walls, or other similar structures.

1.6 IEC 62301 First Edition refers to the test standard published by the International Electrotechnical Commission, titled “Household electrical appliances – Measurement of standby power,” Publication 62301 (first edition June 2005) (incorporated by reference, see §430.3).

1.7 IEC 62301 Second Edition refers to the test standard published by the International Electrotechnical Commission, titled “Household electrical appliances – Measurement of standby power,” Publication 62301 Edition 2.0 2011-01 (incorporated by reference, see §430.3).

1.8 Normal nonoperating temperature means the temperature of all areas of an appliance to be tested are within 5 °F (2.8 °C) of the temperature that the identical areas of the same basic model of the appliance would attain if it remained in the test room for 24 hours while not operating with all oven doors closed and with any gas pilot lights on and adjusted in accordance

with manufacturer's instructions.

1.9 Off mode means a mode in which a conventional cooking top, conventional oven, conventional range, or microwave oven is connected to a mains power source and is not providing any active mode 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 classification of an off mode.

1.10 Primary energy consumption means either the electrical energy consumption of a conventional electric oven or the gas energy consumption of a conventional gas oven.

1.11 Secondary energy consumption means any electrical energy consumption, other than clock energy consumption, of a conventional gas oven.

1.12 Standard cubic foot (or liter (L)) of gas means that quantity of gas that occupies 1 cubic foot (or alternatively expressed in L) when saturated with water vapor at a temperature of 60 °F (15.6 °C) and a pressure of 30 inches of mercury (101.6 kPa) (density of mercury equals 13.595 grams per cubic centimeter).

1.13 Standby mode means any mode in which a conventional cooking top, conventional oven, conventional range, or microwave oven 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) facilitation of the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer; (b) provision of 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 allows for regularly scheduled tasks and that operates on a continuous basis.

1.14 Thermocouple means a device consisting of two dissimilar metals which are joined together and, with their associated wires, are used to measure temperature by means of electromotive force.

1.15 Symbol usage. The following identity relationships are provided to help clarify the symbology used throughout this procedure.

A—Number of Hours in a Year

B—Number of Hours Pilot Light Contributes to Cooking

C—Specific Heat

E—Energy Consumed

Eff—Cooking Efficiency

H—Heating Value of Gas

K—Conversion for Watt-hours to Kilowatt-hours

K_e —3.412 Btu/Wh, Conversion for Watt-hours to Btu's

M—Mass

n—Number of Units

O—Annual Useful Cooking Energy Output

P—Power

Q—Gas Flow Rate

R—Energy Factor, Ratio of Useful Cooking Energy Output to Total Energy Input

S—Number of Self-Cleaning Operations per Year

T—Temperature

t—Time

V—Volume of Gas Consumed

W—Weight of Test Block

2. Test Conditions

* * * * *

2.1.3 Microwave ovens. Install the microwave oven in accordance with the manufacturer's instructions and connect to an electrical supply circuit with voltage as specified in section 2.2.1. The microwave oven shall also be installed in accordance with Section 5, Paragraph 5.2 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3), disregarding the provisions regarding batteries and the determination, classification, and testing of relevant modes. A watt meter shall be installed in the circuit and shall be as described in section 2.9.1.3.

* * * * *

2.2.1 Electrical supply.

2.2.1.1 Voltage. Maintain the electrical supply to the conventional range, conventional cooking top, and conventional oven being tested at 240/120 volts except that basic models rated only at 208/120 volts shall be tested at that rating. Maintain the voltage within 2 percent of the above specified voltages. For microwave oven testing, maintain the electrical supply to the microwave oven at 240/120 volts and 60 hertz. For conventional range, conventional cooking top, and conventional oven standby mode and off mode testing, maintain the electrical supply frequency at 60 hertz \pm 1 percent. Maintain the electrical supply for microwave oven testing within 1 percent of the specified voltage and frequency.

2.2.1.2 Supply voltage waveform. For the standby mode and off mode testing, maintain the electrical supply voltage waveform as indicated in Section 4, Paragraph 4.3.2 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3). If the power measuring instrument

used for testing is unable to measure and record the total harmonic content during the test measurement period, it is acceptable to measure and record the total harmonic content immediately before and after the test measurement period.

* * * * *

2.5 Ambient room air temperature.

2.5.1 Active mode ambient room air temperature. During the active mode test, maintain an ambient room air temperature, T_R , of $77^\circ \pm 9^\circ\text{F}$ ($25^\circ \pm 5^\circ\text{C}$) for conventional ovens and cooking tops, as measured at least 5 feet (1.5 m) and not more than 8 feet (2.4 m) from the nearest surface of the unit under test and approximately 3 feet (0.9 m) above the floor. The temperature shall be measured with a thermometer or temperature indicating system with an accuracy as specified in section 2.9.3.1.

2.5.2 Standby mode and off mode ambient temperature. For standby mode and off mode testing, maintain room ambient air temperature conditions as specified in Section 4, Paragraph 4.2 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3).

2.6 Normal nonoperating temperature. All areas of the appliance to be tested shall attain the normal nonoperating temperature, as defined in section 1.8, before any testing begins. The equipment for measuring the applicable normal nonoperating temperature shall be as described in sections 2.9.3.1, 2.9.3.2, 2.9.3.3, and 2.9.3.4, as applicable.

* * * * *

2.9.1.3 Standby mode and off mode watt meter. The watt meter used to measure standby mode and off mode shall meet the requirements specified in Section 4, Paragraph 4.4 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3). If the power measuring instrument used for testing is unable to measure and record the crest factor, power factor, or

maximum current ratio during the test measurement period, it is acceptable to measure the crest factor, power factor, and maximum current ratio immediately before and after the test measurement period.

* * * * *

3. Test Methods and Measurements

3.1. Test methods.

3.1.1 Conventional oven. Perform a test by establishing the testing conditions set forth in section 2, “TEST CONDITIONS,” of this Appendix, and adjust any pilot lights of a conventional gas oven in accordance with the manufacturer’s instructions and turn off the gas flow to the conventional cooking top, if so equipped. Before beginning the test, the conventional oven shall be at its normal nonoperating temperature as defined in section 1.8 and described in section 2.6. Set the conventional oven test block W_1 approximately in the center of the usable baking space. If there is a selector switch for selecting the mode of operation of the oven, set it for normal baking. If an oven permits baking by either forced convection by using a fan, or without forced convection, the oven is to be tested in each of those two modes. The oven shall remain on for at least one complete thermostat “cut-off/cut-on” of the electrical resistance heaters or gas burners after the test block temperature has increased 234 °F (130 °C) above its initial temperature.

3.1.1.1 Self-cleaning operation of a conventional oven. Establish the test conditions set forth in section 2, “TEST CONDITIONS,” of this Appendix. Adjust any pilot lights of a conventional gas oven in accordance with the manufacturer’s instructions and turn off the gas flow to the conventional cooking top. The temperature of the conventional oven shall be its normal nonoperating temperature as defined in section 1.8 and described in section 2.6. Then set

the conventional oven's self-cleaning process in accordance with the manufacturer's instructions. If the self-cleaning process is adjustable, use the average time recommended by the manufacturer for a moderately soiled oven.

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3.1.2 Conventional cooking top. Establish the test conditions set forth in section 2, "TEST CONDITIONS," of this Appendix. Adjust any pilot lights of a conventional gas cooking top in accordance with the manufacturer's instructions and turn off the gas flow to the conventional oven(s), if so equipped. The temperature of the conventional cooking top shall be its normal nonoperating temperature as defined in section 1.8 and described in section 2.6. Set the test block in the center of the surface unit under test. The small test block, W₂, shall be used on electric surface units of 7 inches (178 mm) or less in diameter. The large test block, W₃, shall be used on electric surface units over 7 inches (177.8 mm) in diameter and on all gas surface units. Turn on the surface unit under test and set its energy input rate to the maximum setting. When the test block reaches 144 °F (80 °C) above its initial test block temperature, immediately reduce the energy input rate to 25±5 percent of the maximum energy input rate. After 15±0.1 minutes at the reduced energy setting, turn off the surface unit under test.

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3.1.3 Microwave oven.

3.1.3.1 Microwave oven test standby mode and off mode power. Establish the testing conditions set forth in section 2, "TEST CONDITIONS," of this Appendix. For microwave ovens 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 (Second Edition) (incorporated by reference; see § 430.3), allow sufficient time for the microwave oven to reach the lower power state before proceeding

with the test measurement. Follow the test procedure as specified in Section 5, Paragraph 5.3.2 of IEC 62301 (Second Edition). For units in which power varies as a function of displayed time in standby mode, set the clock time to 3:23 and use the average power approach described in Section 5, Paragraph 5.3.2(a) of IEC 62301 (First Edition), but with a single test period of 10 minutes +0/-2 sec after an additional stabilization period until the clock time reaches 3:33. If a microwave oven is capable of operation in either standby mode or off mode, as defined in sections 1.13 and 1.9, respectively, or both, test the microwave oven in each mode in which it can operate.

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3.2.3 Microwave oven test standby mode and off mode power. Make measurements as specified in Section 5, Paragraph 5.3 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3). If the microwave oven is capable of operating in standby mode, measure the average standby mode power of the microwave oven, P_{SB} , in watts as specified in section 3.1.3.1. If the microwave oven is capable of operating in off mode, measure the average off mode power of the microwave oven, P_{OFF} , as specified in section 3.1.3.1.

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3.3.13 Record the average standby mode power, P_{SB} , for the microwave oven standby mode, as determined in section 3.2.3 for a microwave oven capable of operating in standby mode. Record the average off mode power, P_{OFF} , for the microwave oven off mode power test, as determined in section 3.2.3 for a microwave oven capable of operating in off mode.

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