**[6450-01-P]**

**DEPARTMENT OF ENERGY**

**10 CFR Part 430**

**[Docket No. EERE-2009-BT-TP-0013]**

**RIN: 1904-AB95**

# Energy Conservation Program for Consumer Products: Test Procedures for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters (Standby Mode and Off Mode)

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

**ACTION:** Final rule.

**SUMMARY:** Where appropriate, the U.S. Department of Energy (DOE) is amending its test procedures for residential water heaters, direct heating equipment (DHE), and pool heaters to include provisions for measuring standby mode and off mode energy consumption, as required by the Energy Independence and Security Act of 2007 (EISA 2007). DOE has concluded that such amendments are necessary for direct heating equipment and pool heaters, but test procedure amendments are not necessary for residential water heaters, because the existing test procedures for those products already address standby mode and off mode energy use. These test procedure amendments are primarily based upon provisions of the latest version of the International Electrotechnical Commission (IEC) Standard 62301 (Second Edition 2011-01), "Household

electrical appliances – Measurement of standby power," which is incorporated by reference. For direct heating equipment and pool heaters, this final rule also adds new calculations to determine the annual energy consumption associated with product operation in standby mode and off mode, and it modifies the existing energy consumption equations to integrate standby mode and off mode energy consumption into the calculation of overall annual energy consumption of these products. For pool heaters only, the standby mode and off mode energy consumption is integrated into the efficiency metric. This rulemaking also adopts a number of definitions for key terms, as well as clarifies the rounding guidance and sampling provisions for the new measurement of standby mode and off mode.

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**DATES:** This rule is effective **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register on **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

The compliance date for any representations relating to standby mode and off mode of residential direct heating equipment and pool heaters is **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**; on and after this date, any such representations must be based upon results generated under these test procedures and sampling plans. For purposes of compliance with energy conservation standards, these test procedure amendments related to standby mode and off mode are not required at this time, but their use will be required upon the compliance date of the next standards final rule which will address standby mode and off mode.

**ADDRESSES:** The docket for this rulemaking is available for review at www.regulations.gov, including Federal Register notices, 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 www.regulations.gov. This web page will contain a link to the docket for this notice in the www.regulations.gov website. The www.regulations.gov webpage contains simple instructions on how to access all documents, including public comments, in the docket.

For further information on how to review the docket, contact Ms. Brenda Edwards at (202) 586-2945 or by email: Brenda.Edwards@ee.doe.gov.

**FOR FURTHER INFORMATION CONTACT:** Mr. Mohammed Khan, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, EE-2J, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-7892. E-mail: Mohammed.Khan@ee.doe.gov.

Mr. Eric Stas, U.S. Department of Energy, Office of the General Counsel, GC-71, 1000 Independence Avenue, SW., Washington, DC, 20585. Telephone: (202) 586-9507. E-mail: Eric.Stas@hq.doe.gov.

**SUPPLEMENTARY INFORMATION:**

This final rule incorporates by reference into Part 430 the following standard:

ANSI Z21.56–2006 ("ANSI Z21.56"), Standard for Gas-Fired Pool Heaters, approved December 13, 2005, IBR approved for Appendix P to Subpart B.

Copies of the ANSI Z21.56-2006 can be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, (212) 642-4936, or http://webstore.ansi.org

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## I. Background and Authority

Title III of the Energy Policy and Conservation Act (42 U.S.C. 6291 et seq.; EPCA or the Act) sets forth a variety of provisions designed to improve energy efficiency. Part A[1] of Title III

[1] This part was originally titled Part B. It was redesignated Part A in the United States Code for editorial reasons.

(42 U.S.C. 6291–6309) establishes the "Energy Conservation Program for Consumer Products Other Than Automobiles," including residential water heaters, direct heating equipment, and pool heaters (all of which are referenced below as "covered products").[2] (42 U.S.C. 6292(a)(4), (9), and (11))

Under the Act, this program consists essentially of four parts: (1) testing; (2) labeling; (3) establishing Federal energy conservation standards; and (4) certification and enforcement procedures. The testing requirements consist of test procedures that manufacturers of covered products must use as the basis for certifying to DOE that their products comply with applicable energy conservation standards adopted pursuant to EPCA and for making representations about the efficiency of those products. (42 U.S.C. 6293(c); 42 U.S.C. 6295(s)) Similarly, DOE must use these test procedures to determine whether the products comply with standards adopted under EPCA. (42 U.S.C. 6295(s))

Under 42 U.S.C. 6293, EPCA sets forth criteria and procedures that 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 must 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 must not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

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[2] All references to EPCA refer to the statute as amended through the Energy Independence and Security Act of 2007, Pub. L. 110-140.

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

On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA 2007), Pub. L. 110-140, was enacted. The EISA 2007 amendments to EPCA, in relevant part, require DOE to amend the test procedures for all covered products to include measures of standby mode and off mode energy consumption. Specifically, section 310 of EISA 2007 provides definitions of "active mode," "standby mode," and "off mode" (42 U.S.C. 6295(gg)(1)(A)); however, the statute 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: (1) 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 (2) 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 .[3] Id. At the time of enactment of EISA 2007, the most current version of the relevant IEC standard was IEC Standard 62301 (First Edition 2005-06).[4]

DOE's test procedures for residential water heaters are found in the Code of Federal Regulations (CFR) at 10 CFR 430.23(e) and 10 CFR part 430, subpart B, appendix E. The test procedures include provisions for determining the energy efficiency (energy factor (EF)), as well as the annual energy consumption of these products.

There are separate test procedures for the two types of direct heating equipment (i.e., vented home heating equipment and unvented home heating equipment), specifically 10 CFR 430.23(g) and 10 CFR part 430, subpart B, appendix G for unvented home heating equipment, and 10 CFR 430.23(o) and 10 CFR part 430, subpart B, appendix O for vented home heating equipment. (Hereafter in this notice, the terms ``vented heater'' and ``unvented heater'' are used as shorthand to describe the two types of direct heating equipment.) The vented heater test procedures include provisions for determining energy efficiency (annual fuel utilization efficiency (AFUE)), as well as annual energy consumption. The unvented heater test procedures currently have no provisions for determining energy efficiency, as all unvented heaters are

[3] IEC standards are available for purchase at: www.iec.ch.

[4] 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 rule.

considered 100-percent efficient, because there is no opportunity for energy loss as is the case for vented heaters. However, for unvented heaters that are the primary heating source for the home, there is a calculation of annual energy consumption based on a single assignment of active mode hours. For unvented heaters that are not the primary heating source for the home, there are no calculation provisions for either efficiency or annual energy consumption. Given that unvented heaters are considered 100-percent efficient, DOE has not established a test procedure for determining energy efficiency of these products (and thus, has not established energy conservation standards for these products), as there would be no energy savings that would result from such actions.

DOE's test procedures for pool heaters are found at 10 CFR 430.23(p) and 10 CFR part 430, subpart B, appendix P. The test procedures include provisions for determining two energy efficiency descriptors (i.e., thermal efficiency and pool heater heating seasonal efficiency), as well as seasonal energy consumption.

The test procedures for residential water heaters include a full-year accounting of energy use, both electricity and fossil fuel as applicable to a given water heater. Specifically, the standby loss testing in the existing test procedure is synonymous with what EISA 2007 asks for inclusion in all test procedures, and, the EISA 2007 definition of "off mode" is inapposite to water heater operation. Accordingly, it was tentatively concluded that the current test procedures for water heaters already fully account for and incorporate measurement of standby mode and off mode energy consumption, as required by EISA 2007.

It is important to note that fossil-fueled direct heating equipment and pool heaters typically consume both fossil fuel and electricity. Electric direct heating equipment only consumes electricity. In the existing test procedures for direct heating equipment, fossil-fuel energy consumption is accounted for comprehensively over a full-year cycle, thereby satisfying EISA 2007 requirements for fossil-fuel standby mode and off mode energy consumption. In the existing test procedures for pool heaters, fossil-fuel standby mode is included but off mode is not included. Electrical energy consumption in standby mode and off mode is not accounted for in either the direct heating equipment or pool heater test procedure.

Proposed amendments to account for the energy consumption in standby mode and off mode of the products subject to this rulemaking were included in a notice of proposed rulemaking (NOPR) that was published in the Federal Register on August 30, 2010. 75 FR 52892. DOE's proposal was presented and explained at a public meeting on September 24, 2010 at DOE headquarters in Washington, DC. DOE invited written comments, data, and information on the NOPR and accepted such material through November 15, 2010. Based upon public comments, DOE subsequently issued a supplemental notice of proposed rulemaking (SNOPR) which would reference the updated second edition of the IEC Standard 62301. 76 FR 56347 (Sept. 13, 2011). DOE invited written comments, data, and information on the SNOPR through October 13, 2011.[5]

[5] DOE notes that it is currently considering potential revisions to the test procedures for residential water heaters, direct heating equipment, and pool heaters in a separate rulemaking. This inquiry is more broadly focused and includes consideration of active mode operation, in contrast to today's final rule, which is limited to standby mode and off mode. DOE published a request for information (RFI) for this rulemaking in the Federal Register on October 12, 2011. 76 FR 63211.

## II. Summary of the Final Rule

In general, DOE has retained the approach to incorporate standby mode and off mode presented in the August 2010 NOPR, as well as incorporation by reference of the latest version of the relevant industry standard proposed in the September 2011 SNOPR, with some modifications based upon public comment input.

As proposed in the August 2010 NOPR, DOE is amending its test procedures for direct heating equipment and pool heaters to provide for the measurement of electrical standby mode and off mode power by using the IEC's Standard 62301, "Household electrical appliances – Measurement of standby power," as well as language to clarify application of this IEC standard. In addition, this final rule adds new calculations to determine annual energy consumption associated with the standby mode and off mode measured power. For pool heaters, the calculations are expanded to include an off mode for fossil-fuel energy consumption, which was not previously accounted for by the test procedure. For vented direct heating equipment, DOE has determined that it is not technically feasible to integrate standby mode and off mode electrical energy consumption into the calculation of overall energy efficiency (annual fuel utilization efficiency (AFUE)). This is primarily because the magnitude of the electrical energy for standby mode and off mode would be so comparatively small that in most cases, no change in the reported AFUE would result from the integration. However, the amendments for pool heaters provide for an integrated efficiency metric, because, for this product, it is technically feasible to integrate standby mode and off mode energy consumption into the calculation of overall annual energy efficiency. The amendments for unvented heaters only required measurement of standby mode and off mode energy consumption and, unlike the amendments

for vented heaters, do not require this consumption to be integrated into an annual energy consumption accounting. This is because a detailed annual energy consumption accounting is not deemed appropriate for this product type (i.e., no annual accounting at all for supplemental heaters and only a simplified assigned value for primary heaters). No amendments are prescribed for residential water heaters, because the existing test procedure and metric for water heaters already account for standby mode and off mode energy consumption.

**III. Discussion**

In the August 30, 2010 NOPR and at the subsequent September 24, 2010 public meeting, DOE sought input from interested parties on the proposed amendments to the DOE test procedures to address the standby mode and off mode energy consumption of residential water heaters, direct heating equipment, and pool heaters. Seven written comments were received from interested parties including: Bradford White Corporation (BWC), the Hearth, Patio & Barbecue Association (HPBA), the Air-Conditioning, Heating and Refrigeration Institute (AHRI), the American Council for an Energy-Efficient Economy (ACEEE), the Association of Home Appliance Manufacturers (AHAM), Natural Resources Defense Council (NRDC), and Pacific Gas and Electric Company (PG&E). All comments were generally supportive of the proposed amendments but asked for clarification and consideration of some specific modifications to possibly improve the amendments.

In addition, three comments were received in response to the September 13, 2011 SNOPR to incorporate IEC Standard 62301 (Second Edition). Comments were submitted by AHRI, AHAM, and a joint comment from Appliance Standards Awareness Project, American

Council for an Energy-Efficiency Economy, and Northwest Energy Efficiency Alliance (ASAP *et al*). These comments were all supportive of the incorporation of IEC Standard 62301 (Second Edition).

The following discussion addresses the five specific issues that were identified in both comment periods and at the public hearing.

A. Determination Not to Amend Test Procedures for Residential Water Heaters

As discussed in the August 2010 NOPR, the test procedures for residential water heaters include a full-year accounting of energy use, both electricity and fossil fuel as applicable to a given water heater. 75 FR 52892, 52895 (August 30, 2010). Specifically, the standby loss testing in the existing test procedure is synonymous with what EISA 2007 asks for inclusion in all test procedures, and the EISA 2007 definition of "off mode" is inapposite to water heater operation. Accordingly, it was tentatively concluded that the current test procedures for water heaters already fully account for and incorporate measurement of standby mode and off mode energy consumption, as required by EISA 2007. (42 U.S.C. 6295(gg)(2)(A))

Bradford White and AHRI were supportive of DOE's determination that the existing water heater test procedures already fully account for standby mode and off mode energy consumption and that no amendments are necessary. (Bradford White, No. 7 at p.1, AHRI, No. 13 at p. 2)

ACEEE also supported the determination, but expressed concern that DOE "does not recognize that some 'residential' water heaters now have a true 'Off' switch and that the future may bring more water heaters with 'off' modes that are power consuming." ACEEE also opined that consideration of this issue, now rather than later, would be beneficial. (ACEEE, No. 14 at p. 1) DOE agrees that if a more complete or accurate measure of energy consumption or energy efficiency can be developed, it should be considered for adoption in the DOE test procedures as soon as possible. However, there exist a number of analytical questions that would need to be investigated and answered before DOE could take such action for residential water heaters, as explained below.

The ACEEE comment focuses on adding provisions to measure the power that might be consumed during a possible off mode and not on the due diligence necessary to develop a consistent and credible basis for defining and measuring off mode energy consumption in the water heater test procedures. DOE's market research did not identify any residential water heater with an "Off" switch. Moreover, ACEEE did not identify any basic model of water heater with an "Off" switch, so DOE is unaware of the existence of such products and thus cannot analyze them for power consumption in off mode. Consequently, DOE has concluded that while ACEEE raises an issue that should be kept in mind, it remains a hypothetical concern at this time. The current test procedure accounting assumes residential water heaters are in service for the entire year and do not have or operate in an off mode. This assumed level of service is representative of how residential water heaters are used in most households and, therefore, consistent with statutory requirements. More specifically, EPCA requires that new or amended 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* and shall not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3) (emphasis added)) This is not to say that every residential water heater will be used this way in the field, but rather, it is the most representative use cycle or period of use. The commenter's suggested off mode that might be the subject of a DOE water heater test procedure amendment would be best described as "out of service" mode. Here, it is important to note that all water heaters can be taken out of service for various reasons and by various methods (e.g., circuit breakers, gas valves). DOE realizes that residential water heaters can be taken out of service for various reasons, but DOE is not aware what design feature of current residential water heaters would in fact produce an out of service mode different (*i.e.*, an off mode) than that which would occur normally (e.g., disconnecting the power supply in a unoccupied home).

The ACEEE comment seems to suggest that a more conveniently placed "Off" switch (one which would allow the consumer to disconnect the water heater from its electrical power or fossil-fuel source) could be a design feature that needs to be addressed in the test procedure. Here, it is important to note that the purpose of the test procedures is to develop a uniform basis of differentiation in terms of energy efficiency or annual consumption that would be associated with any design feature. As such, for purposes of a possible test procedure amendment, a determination would need to be made regarding the consumer behavioral difference that, in fact, may result from an off mode design feature and what, if any, energy savings would result. As noted above, DOE is not aware of any developments in this area by the water heating industry. Further, DOE published a request for information (RFI) which initiated a rulemaking and data

collection process broadly to consider amendments to DOE's test procedures for residential water heaters. 76 FR 63211 (Oct. 12, 2011). This RFI did identify those portions of the test procedure where DOE believes amendments may be warranted, but it also invited interested parties to provide comments on any aspect of the residential water heater test procedure. DOE did not receive any comments asking for adoption of an off period, as suggested by ACEEE.

This is not to say there may not be some possible energy savings potential for this concept eventually, but rather that DOE believes it is not appropriate to include such concept in the analytical basis of the test procedure at this time.

In consideration of all of the above, DOE cannot,at this time take action to amend the water heater test procedure in the manner suggested by the commenter until the off switch concept is more fully developed and the need for such amendment has been established. With that said, DOE continues to monitor advancements in technologies related to all regulated products, including water heaters, and it will consider applicable technological improvements in its development of both test procedures and energy conservation standards in the context of future rulemakings.

B. Use of IEC Standard 62301 (Second Edition), "Household electrical appliances- Measurement of standby power"

As noted in the August 2010 NOPR, 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 Standards 62301 and 62087 of the International Electrotechnical Commission. 75 FR 52892, 52893-94 (August 30, 2010) (*citing* 42 U.S.C. 6295(gg)(2)(A)). The August 2010 NOPR proposed to amend the DOE test procedures for direct heating equipment and pool heaters by referencing IEC Standard 62301 (First Edition) to obtain the standby mode and off mode measured wattage. Id. at 52895. The amended DOE test procedures would use these measured wattages in calculations to accomplish the incorporation of standby mode and off mode energy consumption into the test procedures. DOE reviewed the IEC Standard 62301 (First Edition) and tentatively concluded that it would be generally applicable to direct heating equipment and pool heaters, although some clarification would be needed. Specifically, because there is a possible conflict with provisions of the existing procedures, the NOPR proposed to clarify where the IEC provisions would apply and where the DOE test procedure provisions would apply. Id. at 52897 and 52900-01. With these clarifications, the NOPR proposed to reference IEC Standard 62301 (First Edition) for the wattage measurements. It is noted that IEC Standard 62301 (First Edition) had been incorporated by reference in 10 CFR 430.3, Materials incorporated by reference, as part of the final rule amending the residential furnaces and boilers test procedure. 75 FR 64621 (Oct. 20, 2010).

In written comments on the August 2010 NOPR, AHRI and AHAM asked that DOE consider referencing a revised version of the industry standard -- IEC Standard 62301 (Second Edition). Both commenters cited technical improvements in the latter version that they expect would enhance repeatability and reproducibility of test results. (AHRI, No. 13 at p. 1, AHAM, No. 15 at p.2) AHAM additionally commented that the Final Draft International Standard

(FDIS) version of IEC Standard 62301 would be preferable to the Committee Draft for Vote (CDV) version of the standard, both of which were available at the time of DOE's NOPR. (AHAM, No. 15 at p.2) The CDV of IEC Standard 62301 was released on August 28, 2009, and the FDIS of IEC Standard 62301 was released on October 29, 2010. On this matter, DOE notes that because IEC has now formally adopted IEC Standard 62301 (Second Edition), DOE is no longer considering earlier draft versions. In any event, the adopted version is consistent with the preference suggested by AHRI and AHAM.

As mentioned above, since the time of the August 2010 NOPR, the IEC Standard 62301 technical committee has officially revised its standard. Specifically, a second edition of IEC Standard 62301 has been issued by IEC with a final publication date of January 27, 2011.

DOE has conducted a review of the second edition of IEC Standard 62301, which is consistent with the requirement in EISA 2007 for DOE to consider the most current version of that standard. (42 U.S.C. 6295(gg)(2)(A)) As a result of its investigation, DOE agrees with AHRI and AHAM that some improvement to the test procedures may be possible with the incorporation of the second edition of the IEC standard as applied to the products that are the subject of this rulemaking. Specifically, IEC Standard 62301 (Second Edition) revises the standard's power measurement accuracy provisions, based on technical submissions that showed the inability to achieve the accuracy levels required by the first edition for certain operating regimes with the use of typical instrumentation. A more comprehensive specification of required accuracy is provided in IEC Standard 62301 (Second Edition) that depends upon the characteristics of the power being measured. The other major change in IEC Standard 62301

(Second Edition) that relates to the measurement of standby mode power consumption of covered products involves the specification of stability criteria required to measure that power. IEC Standard 62301 (Second Edition) contains more detailed techniques to evaluate the stability of the power consumption and to measure the power consumption for stable loads with less burdensome methods such as direct meter reading, if certain clearly described conditions are met. DOE believes that the changes incorporated in IEC Standard 62301 (Second Edition) would allow for use of less burdensome methods when appropriate and would ensure accurate measures of standby mode energy consumption over a range of operating conditions encountered by typical residential heating products.

As discussed above, DOE published a supplemental notice of proposed rulemaking in the Federal Register on September 13, 2011 (the September 2011 SNOPR), which proposed to use the second edition of IEC Standard 62301 in lieu of the first edition. 76 FR 56347. Comments on the SNOPR were received from AHAM and AHRI, and a joint comment was submitted by the Appliance Standards Awareness Project, American Council for an Energy-Efficient Economy, and Northwest Energy Efficiency Alliance (ASAP *et al*). All comments were supportive of the use of IEC Standard 62301 (Second Edition). (AHAM, No. 22 at p. 1, AHRI, No. 24 at p.1, and ASAP *et al*, No. 23 at p.1) In addition, ASAP *et al* added that referencing the most recent version of the IEC Standard 62301 would facilitate international harmonization of standby mode and off mode test procedures. (ASAP *et al*, No. 23 at p.1)

Accordingly, for the reasons discussed above, DOE is incorporating IEC Standard 62301 (Second Edition) into DOE's test procedure regulations for residential direct heating equipment

and pool heaters. To this end, this final rule adds a new reference in 10 CFR 430.3, Materials incorporated by reference, for IEC Standard 62301 (Second Edition) but does not remove the existing reference to IEC Standard 62301 (First Edition) at 10 CFR 430.3(m)(1). (Although DOE has determined that the provisions of IEC Standard 62301 (Second Edition) shall be applicable to residential direct heating equipment and pool heaters, the Department is currently maintaining the existing reference to IEC Standard 62301 (First Edition), because other covered products continue to reference that standard.) In addition, DOE is issuing a number of editorial changes in the various appendices (G, O, and P) which are necessary for residential direct heating equipment and pool heaters to allow for the correct referencing. For example, the definition sections of the individual appendices need to define 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 DOE's various test procedures. Finally, as an editorial improvement, DOE is unifying the standby mode and off mode nomenclature used in the various test procedures. Specifically, the uniform nomenclature for electrical power consumption in standby mode and off mode will be $P_{W,SB}$ and $P_{W,OFF}$, respectively. All of these changes are reflected in the regulatory text which can be found at the end of this final rule.

C. Requirements for Unvented Heaters and Exclusion from Testing

In the August 2010 NOPR, DOE proposed only to add certain measurement provisions to the existing test procedures for unvented heaters and not to include added or amended calculations to quantify annual standby mode and off mode energy consumption. In addition,

DOE tentatively concluded that for some manually-controlled portable heaters, no testing for standby mode or off mode is required, because the units are expected to be inoperable during these modes. 75 FR 52892, 52898-99 (August 30, 2010). AHRI, AHAM, and NRDC were supportive of the proposed amendments for unvented heaters, including the exclusion from the requirement to conduct standby mode and off mode testing when there is a means to disconnect the power source and instructions to do so are clearly visible. AHRI and NRDC asked that the exclusion provisions be clarified to avoid ambiguity and possible operational problems. AHAM fully supported these provisions and offered further evidence as to the appropriateness of the exclusion provisions. (AHRI, No. 13 at p.2, AHAM, No. 15 at p. 2-3, and, NRDC, No. 16 at p. 1-2.) AHAM restated its support for these provisions in its comments on the September 2011 SNOPR. (AHAM, No. 22 at p. 2.) AHRI additionally questioned the necessity of any amendments for unvented gas space heaters. (AHRI, No. 13 at p.2.)

The August NOPR proposed for unvented heaters to add separate provisions to measure the possible standby mode and off mode energy consumption for both fossil fuel and electricity. These added provisions would allow for exclusion from the standby mode and off mode requirements if there is means to disconnect the electric or gas power source when not in use and instructions to do so are clearly visible. This exclusion is identical to what is currently in the existing vented heater test procedures as applied to pilot lights on manually-controlled heaters. DOE believes this exclusion should also apply to unvented heaters so equipped.

After carefully considering the public comments and available information, DOE reviewed the proposed provisions for unvented heaters, particularly the exclusion provisions, and

has reached the following conclusions. For electric heaters, DOE has decided to adopt the regulatory provisions, as proposed. The commenters did not provide specific additional clarification, and DOE does not see where such additional guidance or information would be beneficial. For gas unvented heaters, DOE recognizes the point the commenters make regarding clear instructions and the point that AHRI raises concerning the unnecessary turning on and off of pilot lights during the heating season. (AHRI, No. 13 at p. 2) However, DOE believes this issue is best addressed by the industry in its development of instructions and labels and not within the scope of this DOE test procedure rulemaking.

Regarding AHRI's suggestion to not require any amendments for unvented heaters (because to AHRI's knowledge, there are not any unvented heaters that have electrical standby mode and off mode energy consumption), DOE is not convinced there is no possibility for these products to experience electrical standby mode or off mode energy consumption, either currently or in the future. It is important to note, today's final rule does not require any testing for the products that AHRI reports as having no possibility of electrical standby mode or off mode energy consumption (i.e., unvented heaters that have no electrical connection at all). Adopting the amendments as proposed will allow DOE to meet its EISA 2007 mandate without adding unnecessary burden on the manufacturers of current products of this product type.

D. Technical Feasibility of an Integrated Efficiency Metric for Vented Heaters and Pool Heaters

The NOPR proposed an integrated thermal efficiency metric for pool heaters, but did not propose an integrated annual fuel utilization efficiency for vented heaters. All commenters that provided input on this issue were supportive of the proposal not to integrate the standby mode

and off mode energy consumption into the AFUE metric for vented heaters because such integration would not likely change the reported AFUE numerical value. AHRI, NRDC, and PG&E all recommended that DOE adopt the same approach for pool heaters. AHRI restated its opposition to integrating standby mode and off mode energy consumption into the efficiency metric for pool heaters when commenting on the September 2011 SNOPR. These commenters believed that integration would not materially affect the reported value generated by the efficiency metric for pool heaters. A second objection raised by these commenters involved the use of the term "integrated thermal efficiency," who argued that this terminology has specific meaning in the pool heater industry which is not consistent with the meaning proposed by DOE. (AHRI, No. 13 at pp. 2-5, ACEEE, No. 14 at pp.1-2, NRDC, No. 016 at pp 2-3, PG&G 017 at p. 2, and, AHRI, No. 24 at p.1)

DOE considered proposing an integrated AFUE for vented heaters that would incorporate the standby mode and off mode energy consumption into the existing AFUE metric by adding this additional energy consumption to the active energy consumption already captured by the AFUE quotient. However, DOE has determined that such integration is technically infeasible for vented heaters. This is because the electrical standby mode and off mode energy usage would typically be relegated to background noise vis-à-vis the much greater active mode energy consumption, due to the fact that most manufacturers' ratings of AFUE (as well as the current energy conservation standards) are presented to the nearest whole number, and the magnitude of the energy for standby mode and off mode would be so comparatively small that it would not likely change the reported value. As a result, DOE expects that in most cases, no change in the reported AFUE would result from integration. For these reasons, DOE believes integrating

electrical standby mode and off mode energy consumption into the AFUE descriptor for vented heaters would not provide useful or meaningful information and is, therefore, technically infeasible.

DOE's proposed approach for vented heaters would allow for the measurement of standby mode and off mode electrical[6] energy consumption of all vented heater products. Although the magnitude of energy savings may be small for a given unit, it could be substantial when aggregated across the full range of this covered product over DOE's typical 30-year analysis period for setting standards. As required by EPCA, DOE will further address the standby mode and off mode electrical energy consumption of vented heaters in the next energy conservation standards rulemaking. (42 U.S.C. 6295(gg)(3))

Unlike the integrated AFUE for vented heaters, DOE tentatively concluded in the August 2010 NOPR that an integrated efficiency metric for pool heaters is technically feasible and would provide measurable performance differentiation. 75 FR 52892, 52900 (August 30, 2010). As explained in the NOPR, this is because the standby mode and off mode energy consumption for pool heaters is significant relative to the active mode energy consumption, as expressed in the original thermal efficiency descriptor. There were two contributing factors to this conclusion: (1) the standby mode and off mode energy consumption includes both fossil fuel and electrical energy consumption (thereby contributing to the overall magnitude of such energy consumption), and (2) pool heaters have a relatively smaller number of operating hours associated with active mode energy consumption. In support of this determination of a significant difference, the

[6] Fossil-fuel standby mode and off mode energy consumption is already accounted for in the AFUE metric.

NOPR maintained that a standing pilot light alone could move the efficiency metric a few percentage points. Id. Further in support, and realizing that some pool heaters do not have standing pilot lights, DOE testing shows a 1 percentage point difference based solely on the added electrical standby mode and off mode consumption of a unit without a standing pilot light. Certain commenters argued that although the relative magnitude of the effect is larger for pool heaters than direct heating equipment, it is still very small and, as a result, would not allow for effective consumer information or government regulation. (AHRI, No. 13 at pp. 3-5, and, PG&G 017 at p. 2) Additional opposition to the integration was pointed out in the comments of NRDC, which stated that the commingling of electricity and fossil fuels in the integrated metric is not preferred, because it does not allow for separate analysis of the source energy value of electrical standby mode and off mode energy consumption. (NRDC, No. 016 at pp 2-3.) These commenters preferred the separate metric approach for both test procedures and energy conservation standards.

DOE has reviewed this issue, carefully considering the public comments, and has determined it must maintain the integrated efficiency metric approach for pool heaters because it is technically feasible to do so. This is DOE's mandate under EPCA, as amended by EISA 2007. (42 U.S.C. 6295(gg)(2)(A)) As with vented heaters (and any other future energy conservation standards rulemaking for covered consumer products), DOE must address the standby mode and off mode energy consumption in the next standards rulemaking. The integrated metric adopted in this final rule will be the regulating metric for purposes of pool heater standards, once the standard is amended to also address standby mode and off mode energy consumption.

Finally, on the matter of the commenters' objection to the terminology "integrated thermal efficiency," DOE has retained this terminology in this final rule, for the reasons described below. By way of background, EPCA's definition of "efficiency descriptor" specifically states that for pool heaters, the descriptor shall be thermal efficiency. (42 U.S.C. 6291(22)(E)) Accordingly, the "integrated thermal efficiency" terminology was proposed to maintain consistency with the statute. This approach would allow for the integration and incorporation of standby mode and off mode energy consumption into the test procedure as called for in 42 U.S.C. 6295(gg)(2)(A) and eventual incorporation in the energy conservation standard as called for in 42 U.S.C. 6295(gg)(3). The original "thermal efficiency" descriptor would remain in the test procedure to provide the regulating basis for the current energy conservation standard. Commenters pointed out that the term "thermal efficiency" has a specific meaning in the industry. Specifically, "thermal efficiency" is based on the industry test methods (ANSI Z21.56, "Standard for Gas-Fired Pool Heaters") and describes the pool heater's performance in terms of heating water and not the unit's overall performance, including the energy liability that might be associated with standby mode and off mode operation. AHRI suggested that the existing test procedure terminology "heating seasonal efficiency" would be preferable, because it is an extension of thermal efficiency that includes the pilot light consumption in standby mode and is ideally suited for modification to include the standby mode and off mode electrical energy consumption. (However, DOE notes that the heating seasonal efficiency descriptor, as suggested by AHRI, does not fully account for the standby hours in the non-heating season, unlike DOE's integrated thermal efficiency descriptor. Moreover, DOE believes that including the non-heating standby hours in a seaonal metric could also cause confusion, because the metric would then be a bit of a misnomer.)

Nevertheless, despite commenters' preference for a different metric and terminology to measure the performance of pool heaters, one cannot lose sight of the fact that EPCA specifically states that the efficiency descriptor for pool heaters shall be thermal efficiency (42 U.S.C. 6291(22)(E)), and the statute also requires DOE to account for standby mode and off mode energy consumption in an integrated metric, if technically feasible (42 U.S.C. 6295(gg)(2)(A) and (3)). Thus, DOE does not have lattitude to adopt other metrics as commenters suggested. Instead, the Department is adopting integrated thermal efficiency in order to implement both of these statutory requirements. Furthermore, DOE also believes that there are advantages to maintaining consistency of its terminology related to standby mode and off mode across the test procedures for various products. DOE is confident that manufacturers and other interested stakeholders will be able to grasp the relevant terminology for purposes of the DOE test procedure. Accordingly, DOE has today prescribed "integrated thermal efficiency" ($TE_I$) as the integrated efficiency descriptor for pool heaters.

To further clarify its test procedure regulations for pool heaters, DOE is also prescribing a number of editorial changes to 10 CFR 430.23(p). These edits are largely housekeeping matters designed to correct the references to sections of appendix P that have now changed numerically because of today's final rule.

E. Hearth Products Coverage

HPBA filed two sets of comments on the August 2010 NOPR. In the first set of comments, HPBA concluded that the provisions related to measurement of standby mode and off

mode energy consumption "will probably have a minimal inpact on vented hearth heating products." However, in its second set of comments, HPBA stated more broadly that the test procedures for direct heating equipment are not applicable to decorative hearth products, specifically the products covered by ANSI Standard Z21.50, "Vented Gas Fireplaces." According to HPBA, decorative hearth products are intended to provide ambiance rather than heat, so, therefore, HPBA believes decorative hearth products are not covered "direct heating equipment" and that heating efficiency is not an appropriate measure of performance for these products. Further, HPBA maintains that even if heating efficiency was desired for these appliances, the DOE test method is inapplicable as a means to determine heating efficiency, given a number of inappropriate assumptions regarding their representative average use. ACEEE recognized this concern of HPBA but suggested the matter not be addressed in a test method rulemaking. (HPBA, No.8 at p.1 and No. 12 at p. 1-4. ACEEE, No. 14 at p.1.)

In response, DOE notes that the scope of the current test procedure rulemaking is limited to provisions related to measurement of standby mode and off mode energy consumption of residential water heaters, direct heating equipment, and pool heaters. HPBA concedes that the specific provisions at issue here would have minimal impact on vented hearth heating products. On HPBA's larger question regarding the applicability of the DOE test procedure for measuring the AFUE of vented hearth heaters, DOE has concluded that the test procedure does provide the technical capability to generate AFUE values for all vented hearth heaters. If modifications to the test procedure are warranted to optimize the testing of such units, such concerns will be addressed in a separate test procedure rulemaking for water heaters, direct heating equipment,

and pool heaters, which is currently underway. As noted earlier, DOE published an RFI for that rulemaking in the Federal Register on October 12, 2011. 76 FR 63211.

However, DOE notes that in its November 18, 2011 final rule for direct heating equipment energy conservation standards, DOE adopted a definition of "vented hearth heater" which contains an exclusion for decorative hearth products. 76 FR 71836, 71859. Units that fall within the exclusion would not be subject to the otherwise applicable energy conservation standards, and they would likewise not be required to be tested under the DOE test procedure.

F. Review of Burner Operating Hours Estimates

NRDC suggested that DOE should review the burner operating hours (BOH) estimate in the test procedures for each appliance type. (NRDC No. 016, pp. 1-2) NRDC further added that these estimates are referenced from earlier ANSI standards, some of which are well over ten years old. It is noted here that these estimates are relevant to the matter of this rulemaking because BOH is used as an approximation of the active mode time duration for both direct heating equipment and pool heaters. This concept of using the existing test procedures assignment of BOH as an approximation of active mode time duration was developed in the August 2010 NOPR. 75 FR 52892, 52897 (August 30, 2010). No comments were received objecting to this assignment. The NRDC comment relates to the numerical value of the current test procedure estimate and whether there is a need to update the numerical value of these assignments in the test procedures.

DOE has reviewed this matter, and for the reasons explained below, DOE has concluded that there is not a need to change the test procedure estimates of BOH for direct heating equipment or pool heaters. These test procedure estimates are not referenced from old ANSI standards as the commenter suggests, but rather independent assignments and equations developed within the various rulemakings establishing the DOE test procedures. With these representative bases established, the test procedures can yield uniform results. The direct heating equipment BOH is based primarily on an estimate of heating degree days that would be typical of where direct heating equipment is used. For the national average case, 2950 heating degree days is assigned. 43 FR 20147, 20182 (May 10, 1978). The BOH for direct heating equipment is then calculated from this heating degree day assignment and a number of other factors that can affect the BOH of direct heating equipment. Typically, the test procedure yields values of 700-800 BOH for DHE. The level of national average heating degree days is representative of a southern-tier U.S. location which DOE believes is still appropriate for the distribution of direct heating equipment. That is, the inherently smaller capacities of DHE, as compared to central furnaces would suggest that DHE product types address on average a relatively milder or more southern heating requirement. A review of the 2009 Residential Energy Consumption Survey (available at www.eia.gov) supports this southern tier approach for DHE products. Specifically, the RECS 2009 Table HC6.6, "Space Heating in U.S. Homes, By Climate Region," reports that a majority of households having this type of product (termed in RECS 2009 as "room heaters" and "wall and floor pipeless furnaces") are in the two southernmost of the five climate zones used by RECS.

Further, a review of the 2005 Residential Energy Consumption Survey (also available at www.eia.gov) provided more data supporting DOE's current approach to BOH. A weighted average of the heating degree days using the distribution of room heaters and wall and floor pipeless furnaces resulted in an estimate that homes in which direct heating equipment is installed are subjected to an annual heating degree day number of 2900. Considering the uncertainty in this value, DOE considers this estimate to be highly consistent with the existing value in the test method, and accordingly, DOE has concluded that there is no justification for modifying the heating degree days that form the basis of the determination of burner operating hours for direct heating equipment. It should be noted that the data released for the 2009 RECS do not yet contain sufficient information to determine this weighted average more precisely. However, these data are supportive of the southern tier assignment for national average heating degree days as currently provided in the DOE test procedure. It is important to note that the regional calculations in this test procedure allow for other assignments based on geographic location.

Investigating this issue further, DOE looked at another source of information to determine if the DHE test procedures' overall calculation methodology would need amending. To this end, DOE reviewed the estimates of energy consumption contained in the recent analysis supporting amended energy conservation standards for DHE. 75 FR 20112 (April 16, 2010). That analysis reported BOH similar to that estimated in the DOE test procedure (700-800 hours) for DHE used as primary heating appliances; however, a smaller number is reported for BOH in

this analysis for some types of DHE that could be used as supplemental heaters.[7] That lower estimate is important to bear in mind in a standards analysis in order to avoid overestimating the energy savings that might be associated with a given standard level. However, DOE believes supplemental use or any non-use of a product should not be part of the test procedures' representative use calculations. Rather, a better basis of the representative use calculations would be calculations that include full use of the product. Given the significant portion of DHE products that are used as primary heating sources and the product's potential to be used on a regular basis, DOE has concluded that the test procedure should assume full use. Moreover, persons relying on energy use estimates when making purchasing decisions and planning on frequent use of the product would not be served by reducing the estimate to account for the marginal use of the product by others.

In sum, DOE has reviewed all aspects of the current BOH assignments and calculations for direct heating equipment and has not found any potential for systematic error or unrepresentative results. More specifically, DOE did not find any research or data that contradicts the representativeness of this existing basis of determining direct heating equipment BOH.

Somewhat less complicated than direct heating equipment, the pool heater test procedure includes a direct assignment of BOH, without need for the complicated suite of calculations found in the DHE test procedure. This simplified approach is reasonable because the energy

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[7] For more information, see the DHE life-cycle cost and payback period spread sheet which is available at: http://www1.eere.energy.gov/buildings/appliance_standards/residential/heating_products_fr_spreadsheets.html.

consumption of pool heaters is not typically affected by the various factors accounted for in the DHE test procedure calculations (*e.g.*, oversizing, climatic effects, and the lack of modulating controls). Accordingly, the pool heater test procedure assumes a single assignment of 104 BOH. This assignment is based on survey data available at the time proposed amendments for the test procedure were developed in 1993. 58 FR 44538, 44548, 44571 (August 23, 1993). On review, this level of usage is still deemed representative. Specifically, the 2005 Residential Energy Conservation Survey (available at www.eia.gov) reports similar usage for pool heaters.

In sum, DOE has reviewed the numerical assignments as well as the analytical basis for BOH in both the direct heating equipment and pool heaters test procedures and maintains that they are representative of the average use cycles that would be encountered by present day appliances.

G. Other Issues Raised in the September 2011 SNOPR

In addition to proposing the use of the second edition of IEC Standard 62301, the September 2011 SNOPR clarified rounding guidance and sampling provisions applicable to the new measures of energy consumption (i.e., $P_{W,SB}$ and $P_{W,OFF}$).

For these new values of energy consumption, the September 2011 SNOPR clarified that the rounding guidance provided in IEC Standard 62301 (Second Edition) would apply. 76 FR 56347, 56350-51 (Sept. 13, 2011). Specifically, DOE proposed to add the following sentence to the measurement provisions of the proposed regulatory text, where appropriate: "The recorded standby power ($P_{W,SB}$) (or off mode power $P_{W,OFF,}$ where appropriate) shall be rounded to the

second decimal place, and for loads greater than or equal to 10W, at least three significant figures shall be reported." Id. at 56353-54. DOE requested comments as to the adequacy and appropriateness of this clarification. AHRI opined that the second decimal place rounding represents an unnecessarily stringent level of precision when one considers the annualized accounting of total electrical energy consumption as represented in the term $E_{SO}$. (AHRI No. 24 at p. 2) DOE believes the IEC rounding provisions for the wattage measurements are appropriate and within the capabilities of the instrumentation specified in the IEC standard. Specifically, DOE's review of IEC Standard 62301-compliant instrumentation has determined that one can easily support this level of reporting precision. Moreover, the test procedures for other DOE covered products already utilize IEC Standard 62301 for the wattage measurements, and DOE believes there is benefit in measuring standby mode and off mode energy consumption of various covered products in a consistent manner. In sum, carrying the IEC level of precision through the annualized consumption calculations does not represent any additional burden, because it is simply a matter of running a calculation and reporting the results. Accordingly, DOE has concluded that these comments do not justify a departure from the IEC provisions, so DOE is adopting the rounding guidance as proposed.

The September 2011 SNOPR clarified that the sampling provisions already used for the measures of energy consumption in the existing test procedures for direct heating equipment and pool heaters would also apply to the new measures of energy consumption for standby mode and off mode. Id. at 56350-51. No comments were received regarding the clarification of applicable sampling provisions for the new measures of energy consumption. Accordingly, for the reasons

above, DOE has decided to adopt the proposed approach presented in the SNOPR in today's final rule.

## IV. Effective Date and Compliance Date

The effective date for these amendments is **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. At that time, representations may be made about residential direct heating equipment and pool heaters using the new metrics $P_{W,SB}$ and $P_{W,OFF}$ reflecting standby mode and off mode energy use, as well as any other measure of energy consumption which depends on $P_{W,SB}$ and $P_{W,OFF,}$ which were adopted pursuant to these amendments. The compliance date for any representations relating to standby mode and off mode of direct heating equipment and pool heaters is **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**; on or after that date, any such representations must be based upon results generated under these test procedures and sampling plans. However, DOE would clarify that use of these proposed test procedure amendments related to standby mode and off mode energy consumption would not be required for purposes of energy conservation standards compliance, until the compliance date of the next standards final rule that addresses standby mode and off mode.

More specifically, the introductory sentences to 10 CFR part 430, subpart B, Appendix O for vented direct heating equipment and Appendix P for pool heaters, read as follows: "The procedures and calculations that refer to standby mode and off mode energy consumption …need not be performed to determine compliance with energy conservation standards for these products at this time." The above statement will be removed as part of a future rulemaking to amend

either energy conservation standards for direct heating equipment or standards for pool heaters to account for standby mode and off mode energy consumption, and compliance with the applicable test procedure provisions will be required on the compliance date of those amended energy conservation standards. A statement has also been added to the introductory note to these appendices to clarify that any representations pertaining to standby mode and off mode energy consumption of these products that are made on or after a date 180 days after the date of publication of this 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). Although this is a statutory requirement under 42 U.S.C. 6293(c), DOE has concluded that it would be useful to explicitly state this requirement in DOE's regulations.

## V. Compliance With Other EPCA Requirements

In amending a test procedure, EPCA directs DOE to determine to what extent, if any, the test procedure would alter the measured energy efficiency or measured energy use of a covered product. (42 U.S.C. 6293(e)(1)) If the amended test procedure alters the measured energy efficiency or measured energy use, the Secretary must amend the applicable energy conservation standard to the extent the amended test procedure changes the energy efficiency of products that minimally comply with the existing standard. (42 U.S.C. 6293(e)(2)) The current energy conservation standards for vented direct heating equipment and pool heaters are based on existing test procedure metrics -- annual fuel utilization efficiency (AFUE) and thermal efficiency ($E_t$), respectively -- neither of which is affected by the inclusion of electrical standby mode and off mode energy consumption in other metrics adopted as part of today's final rule. There are no energy conservation standards for unvented direct heating equipment. As explained

further below, today's test procedure final rule has no effect on any current energy conservation standard.

As provided by EPCA, amendments to the test procedures to include standby mode and off mode energy consumption shall not be used to determine compliance with previously established standards. (42 U.S.C. 6295(gg)(2)(C)) The inclusion of a standby mode and off mode test method in this final rule will not affect a manufacturer's ability, using existing metrics, to demonstrate compliance with the existing energy conservation standards for direct heating equipment or pool heaters. The standby mode and off mode tests need not be performed to determine compliance with the current energy conservation standards for these products, because the current standards do not comprehensively account for electrical standby mode and off mode energy consumption. (For the reasons stated above, this final rule does not prescribe test procedure amendments for residential water heaters. Accordingly, there is no effect on water heater compliance.)

EPCA requires that new or amended 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 and shall not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) For the reasons that follow, DOE has determined that incorporation by reference of IEC Standard 62301 (Second Edition), along with the other modifications and additional calculations described above, satisfy this requirement.

As noted previously, the DOE test procedures, as amended, reference provisions from the incorporated IEC Standard 62301 (Second Edition) for the measurement of standby mode and off mode energy consumption, which is a widely-accepted and used international standard. Based on its analysis of IEC Standard 62301 (Second Edition), DOE has determined that the test methods and equipment that the amendments require for measuring standby mode and off mode power do not differ substantially from the test methods and equipment in the current DOE test procedure for residential direct heating equipment and pool heaters. Therefore, testing of these products pursuant to today's final rule will not require any significant investment in new test facilities or equipment. For these reasons, DOE does not believe that the standby mode and off mode test procedure provisions will add significant costs.

## VI. Procedural Issues and Regulatory Review

### A. Review Under Executive Order 12866

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

### B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq*., as amended by the Small Business Regulatory Enforcement Fairness Act of 1996) requires preparation of an initial regulatory flexibility analysis (IRFA) for any rule that, by law, must be proposed for public comment and a final regulatory flexibility analysis (FRFA) for any such rule that an agency adopts as a final

rule, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. A regulatory flexibility analysis examines the impact of the rule on small entities and considers alternative ways of reducing negative effects. Also, as required by Executive Order 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's website at www.gc.doe.gov/gc/office-general-counsel.

Today's final rule adopts test procedure provisions to measure standby mode and off mode energy consumption of residential direct heating equipment and pool heaters, generally through the incorporation by reference of IEC Standard 62301 (Second Edition) and the modifications and additional calculations described in detail in the August 2010 NOPR. DOE reviewed today's final rule under the provisions of the Regulatory Flexibility Act and the policies and procedures published on February 19, 2003. 68 FR 7990.

As noted above, the test procedure incorporates by reference provisions from IEC Standard 62301 (Second Edition)[8] for the measurement of standby mode and off mode energy consumption. IEC Standard 62301 (Second Edition) is widely accepted and used internationally to measure electric power in standby mode and off mode. Based on its analysis of IEC Standard

[8] The August 2010 NOPR review under the Regulatory Flexibly Act was regarding IEC Standard 62301 (First Edition). In the subsequent September 2011 SNOPR which proposed to adopt the IEC Standard 62301.( Second Edition), it was tentatively determined that the second edition would be expected to reduce testing burden relative to the first edition. 76 FR 56347, 56351 (Sept. 13, 2011). DOE hereby confirms that conclusion in today's final rule.

62301 (Second Edition), DOE determined that the test methods and equipment that the amendments require for measuring standby mode and off mode power do not differ substantially from the test methods and equipment in the current DOE test procedure for direct heating equipment and pool heaters. Even if the testing facility decides to upgrade its measurement instrumentation to meet today's rule, an applicable meter (i.e., one that complies with IEC Standard 62301) would cost $3000 or less. Therefore, testing of direct heating equipment and pool heaters pursuant to today's final rule will not require any significant investment in test facilities or new equipment. The testing time to conduct the standby mode and off mode testing on a single unit is estimated at 15 minutes to 60 minutes. Assuming a laboratory technician would be present at a cost of $60 per hour, this time represents a labor cost range of $15 to $60. This range of cost would be related to the stability of the electrical consumption being measured, with a longer testing time being required for unstable measurements in order to allow for accurate averaging. It is important to note, that the second edition of IEC Standard 62301 sought improvement in this area by more clearly defining the stability criteria and allowing for less burdensome direct meter reading methods, thereby reducing testing time in cases where the criteria are met. In the worst case, the impacts of the potential incremental instrument and labor costs are still small compared to the overall financial investment needed to undertake a business enterprise involving the testing of consumer products. For these reasons, DOE has concluded that the standby mode and off mode test procedure provisions will not add significant costs.

For the manufacturers of the three types of heating products, the Small Business Administration (SBA) has set a size threshold, which defines those entities classified as "small businesses" for the purposes of the statute. DOE used the SBA's small business size standards to determine whether any small entities would be subject to the requirements of the rule. 65 FR

30836, 30848-49 (May 15, 2000), as amended at 65 FR 53533, 53544-45 (Sept. 5, 2000) and codified at 13 CFR part 121. The size standards are listed by North American Industry Classification System (NAICS) code and industry description and are available at http://www.sba.gov/sites/default/files/files/Size_Standards_Table(1).pdf. Residential water heater manufacturing is classified under NAICS 335228 – "Other Major Household Appliance Manufacturing." DHE and pool heater manufacturing are classified under NAICS 333414 – "Heating Equipment (except Warm Air Furnaces) Manufacturing." The SBA sets a threshold of 500 employees or less for an entity to be considered as a small business for both of these categories. However, since DOE has determined that it is not necessary to establish additional standby mode and off mode test procedure provisions for water heaters in this rulemaking, there is no need to analyze the impact of this rulemaking on water heater manufacturers.

In a recent review of the residential DHE and pool heater markets, DOE identified 10 manufacturers of only vented DHE, 3 manufacturers of only unvented DHE, 2 manufacturers of both vented and unvented DHE, and 1 pool heater manufacturer that can be considered small businesses. DOE's research involved reviewing several industry trade association membership directories (e.g., AHRI and HPBA), product databases (e.g. AHRI, CEC, and ENERGY STAR databases), individual company websites, and marketing research tools (e.g. Dun and Bradstreet reports) to create a list of all domestic small business manufacturers of direct heating equipment and gas-fired pool heaters covered by this rulemaking. In the August 2010 NOPR, DOE identified a similar number of small business manufacturers and tentatively certified that this rule would not have a significant impact on a substantial number of small entities. 75 FR 52892, 52901-02 (August 30, 2010). Additionally, as discussed above, DOE hereby confirms that the

IEC Standard 62301 (Second Edition) would be expected to reduce testing burden relative to the first edition and confirms that this rule would not have a significant economic impact on a substantial number of small entities. Accordingly, DOE has not prepared a regulatory flexibility analysis for this rulemaking. DOE's certification and supporting statement of factual basis was provided to the Chief Counsel for Advocacy of the SBA for review under 5 U.S.C. 605(b). DOE did not receive any comments or public testimony regarding a significant economic impact on any small entities. Thus, DOE reaffirms and certifies that this rule will not have a significant economic impact on a substantial number of small entities.

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of residential direct heating equipment and pool heaters must certify to DOE that their products comply with all applicable energy conservation standards. In certifying compliance, manufacturers must test according to the applicable DOE test procedures, including any amendments adopted for those test procedures on the date that compliance is required. DOE has established regulations for the certification and recordkeeping requirements for all covered products and commercial equipment, including residential direct heating equipment and pool heaters (76 FR 12422 (March 7, 2011)). The collection-of-information requirement for certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (PRA). This requirement has been approved by OMB under OMB Control Number 1910-1400. Public reporting burden for the certification is estimated to average 20 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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

D. Review Under the National Environmental Policy Act

DOE is establishing a final rule to amend the test procedure for residential direct heating equipment and pool heaters to address measurement of the standby mode and off mode energy consumption of these products. DOE has determined that this final rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), and DOE's implementing regulations at 10 CFR part 1021. Specifically, this final rule, which adopts an industry standard for measurement of standby mode and off mode energy consumption, amends an existing rule without affecting the amount, quality, or distribution of energy usage, and, therefore, will not result in any environmental impacts. Thus, this rulemaking is covered by Categorical Exclusion A5 found in 10 CFR part 1021, subpart D, which applies to any rulemaking that interprets or amends an existing rule without changing the environmental effect of that rule. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, "Federalism," imposes certain requirements on Federal agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. 64 FR 43255 (August 10, 1999). The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would

limit the policymaking discretion of the States, and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process that it will follow in the development of such regulations. 65 FR 13735. DOE has examined this final rule and determined that it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subject of today's final rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) Therefore, Executive Order 13132 requires no further action.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice Reform," 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Regarding the review required by section 3(a), section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the

retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, this rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. (Pub. L. 104-4, sec. 201 (codified at 2 U.S.C. 1531)) For regulatory actions likely to result in a rule that may cause expenditures by State, local, and Tribal governments, in the aggregate, or by the private sector, of $100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a) and (b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a "significant intergovernmental mandate," and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect them. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820. (This policy is also available at http://www.gc.doe.gov.) DOE

examined today's final rule, which modifies the current test procedures for direct heating equipment and pool heaters according to UMRA and its statement of policy and determined that the rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of $100 million or more in any year. Accordingly, no further assessment or analysis is required under UMRA.

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

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This rule would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

Pursuant to Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights," 53 FR 8859 (March 15, 1988), DOE has determined that this final rule would not result in any takings that might require compensation under the Fifth Amendment to the United States Constitution.

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

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for Federal agencies to review most disseminations of information to the public under information quality guidelines established by each agency pursuant to general

guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). DOE has reviewed today's final rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OIRA at OMB, a Statement of Energy Effects for any significant energy action. A "significant energy action" is defined as any action by an agency that promulgates or is expected to lead to promulgation of a final rule, and that: (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use. Today's final rule is not a significant regulatory action under Executive Order 12866 or any successor order; would not have a significant adverse effect on the supply, distribution, or use of energy; and has not been designated by the Administrator of OIRA as a significant energy action. Therefore, DOE has determined that this rule is not a significant energy action. Accordingly, DOE has not prepared a Statement of Energy Effects for this rulemaking.

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

Under section 301 of the Department of Energy Organization Act (Pub. L. 95-91; 42 U.S.C. 7101 et seq.), DOE must comply with all laws applicable to the former Federal Energy Administration, including section 32 of the Federal Energy Administration Act of 1974 (Pub. L. 93-275), as amended by the Federal Energy Administration Authorization Act of 1977 (Pub. L. 95-70). (15 U.S.C. 788) Section 32 provides in relevant part that where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Federal Trade Commission (FTC) concerning the impact of commercial or industry standards on competition.

Certain of the amendments and revisions in this final rule incorporate testing methods contained in the following commercial standard, the International Electrotechnical Commission (IEC) Standard 62301, "Household electrical appliances – Measurement of standby power" (Second Edition, 2011-01). DOE has evaluated this standard and is unable to conclude whether it fully complies with the requirements of section 32(b) of the Federal Energy Administration Act (i.e., that it was developed in a manner that fully provides for public participation, comment, and review). DOE has consulted with the Attorney General and the Chairman of the FTC concerning the impact on competition of requiring manufacturers to use the test methods contained in this standard, and neither recommended against incorporation of this standard.

M. Congressional Notification

As required by 5 U.S.C. 801, DOE will report to Congress on the promulgation of today's rule before its effective date. The report will state that it has been determined that the rule is not a "major rule" as defined by 5 U.S.C. 804(2).

## VII. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this final rule.

## List of Subjects in 10 CFR Part 430

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

Issued in Washington, DC, on November 16, 2012.

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

For the reasons stated in the preamble, DOE is amending part 430 of Chapter II, Subchapter D of Title 10 of the Code of Federal Regulations, as set forth below:

**PART 430--ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS**

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

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

2. Section 430.3 is amended by revising paragraphs (d)(16) and (m)(2) to read as follows;

**§ 430.3 Materials incorporated by reference.**

* * * * *

(d) * * *

(16) ANSI Z21.56—2006, section 2.10 ("ANSI Z21.56"), Standard for Gas-Fired Pool Heaters, approved December 13, 2005, IBR approved for appendix P to subpart B.

* * * * *

(m) * * *

(2) IEC 62301 ("IEC 62301"), Household electrical appliances – Measurement of standby power , (Edition 2.0, 2011-01), IBR approved for appendices C1, G, I, J2, O, P, and X1 to subpart B.

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**§ 430.23 [Amended]**

3. Section 430.23 is amended by:

a. Removing the words "section 4.2 of appendix P" in paragraph (p)(1)(i) and adding in their place "section 5.2 of appendix P"; and

b. Removing the words "section 4.3 of appendix P" in paragraph (p)(1)(ii) and adding in their place "section 5.3 of appendix P".

4. Appendix G to Subpart B of Part 430 is amended in section 2 by adding sections 2.3, 2.3.1, 2.4, and 2.4.1 to read as follows:

**APPENDIX G TO SUBPART B OF PART 430–UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF UNVENTED HOME HEATING EQUIPMENT**

*  *  *  *  *

2.  *  *  *

2.3 Pilot light measurement. Except as provided in section 2.3.1 of this appendix, measure the energy input rate to the pilot light ($Q_p$), with an error no greater than 3 percent, for unvented heaters so equipped.

2.3.1 The measurement of $Q_p$ is not required for unvented heaters where the pilot light is designed to be turned off by the user when the heater is not in use (i.e., for units where turning the control to the OFF position will shut off the gas supply to the burner(s) and the pilot light). This provision applies only if an instruction to turn off the unit is provided on the heater near the gas control value (e.g., by label) by the manufacturer.

2.4 Electrical standby mode power measurement. Except as provided in section 2.4.1 of this appendix, for all electric heaters and unvented heaters with electrical auxiliaries, measure the standby power ($P_{W,SB}$) in accordance with the procedures in IEC 62301 Second Edition (incorporated by reference; see §430.3), with all electrical auxiliaries not activated. Voltage shall be as specified in section 1.4.1 *Electrical supply* of this appendix. The recorded standby power ($P_{W,SB}$) shall be rounded to the second decimal place, and for loads greater than or equal to 10W, at least three significant figures shall be reported.

2.4.1 The measurement of $P_{W,SB}$ is not required for heaters designed to be turned off by the user when the heater is not in use (i.e., for units where turning the control to the OFF position will shut off the electrical supply to the heater). This provision applies only if an instruction to turn off the unit is provided on the heater (e.g., by label) by the manufacturer.

* * * * *

5. Appendix O to Subpart B of Part 430 is amended by:

a. Adding a Note after the heading;

b. Redesignating sections 1.1 through 1.32 as follows:

| Old sections | New sections |
|---|---|
| 1.1 to 1.14 | 1.2 to 1.15 |
| 1.15 to 1.19 | 1.17 to 1.21 |
| 1.20 and 1.21 | 1.23 and 1.24 |
| 1.22 to 1.25 | 1.26 to 1.29 |
| 1.26 to 1.32 | 1.31 to 1.37 |

c. Adding new sections 1.1, 1.16, 1.22, 1.25 and 1.30;

d. Adding sections 3.7, 3.7.1, and 3.7.2; and

e. Revising sections 4.6.3 and 4.6.3.1, and adding section 4.7.

The additions and revisions read as follows:

**APPENDIX O TO SUBPART B OF PART 430–UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF VENTED HOME HEATING EQUIPMENT**

Note: The procedures and calculations that refer to standby mode and off mode energy consumption, (i.e., sections 3.7 and 4.7 of this appendix) need not be performed to determine compliance with energy conservation standards for vented heaters at this time. However, on or after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, any representation related to standby mode and off mode energy consumption of these products must be based upon results generated under this test procedure, consistent with the requirements of 42 U.S.C. 6293(c)(2). For vented home heating equipment, the statute requires that after July 1, 2010, any adopted energy conservation standard shall incorporate 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.

1.0. Definitions.

1.1 "Active mode" means the condition during the heating season in which the vented heater is connected to the power source, and either the burner or any electrical auxiliary is activated.

*  *  *  *  *

1.16 "IEC 62301 (Second Edition)" means 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).

*  *  *  *  *

1.22 "Off mode" means the condition during the non-heating season in which the vented heater is connected to the power source, and neither the burner nor any electrical auxiliary is activated.

*  *  *  *  *

1.25 "Seasonal off switch" means the control device, such as a lever or toggle, on the vented heater that affects a difference in off mode energy consumption as compared to standby mode consumption.

*  *  *  *  *

1.30 "Standby mode" means the condition during the heating season in which the vented heater is connected to the power source, and neither the burner nor any electrical auxiliary is activated.

* * * * *

3.0 * * *

3.7 Measurement of electrical standby mode and off mode power.

3.7.1 Standby power measurements. With all electrical auxiliaries of the vented heater not activated, measure the standby power ($P_{W,SB}$) in accordance with the procedures in IEC 62301 (Second Edition) (incorporated by reference, see §430.3), except that section 2.9, *Room ambient temperature,* and the voltage provision of section 2.3.5, *Electrical supply,* of this appendix shall apply in lieu of the IEC 62301 (Second Edition) corresponding sections 4.2, *Test room,* and 4.3, *Power supply*. Clarifying further, the IEC 62301 (Second Edition) sections 4.4, *Power measuring instruments,* and section 5, *Measurements,* shall apply in lieu of section 2.8, *Energy flow instrumentation,* of this appendix. Measure the wattage so that all possible standby mode wattage for the entire appliance is recorded, not just the standby mode wattage of a single auxiliary. The recorded standby power ($P_{W,SB}$) shall be rounded to the second decimal place, and for loads greater than or equal to 10W, at least three significant figures shall be reported.

3.7.2 Off mode power measurement. If the unit is equipped with a seasonal off switch or there is an expected difference between off mode power and standby mode power, measure off mode power ($P_{W,OFF}$) in accordance with the standby power procedures in IEC 62301 (Second Edition) (incorporated by reference, see §430.3), except that section 2.9, *Room ambient temperature*, and the voltage provision of section 2.3.5, *Electrical supply,* of this appendix shall apply in lieu of the IEC 62301 (Second Edition) corresponding sections 4.2, *Test room,* and 4.3,

*Power supply*. Clarifying further, the IEC 62301 (Second Edition) sections 4.4, *Power measuring instruments,* and section 5, *Measurements,* shall apply in lieu of section 2.8, *Energy flow instrumentation,* of this appendix. Measure the wattage so that all possible off mode wattage for the entire appliance is recorded, not just the off mode wattage of a single auxiliary. If there is no expected difference in off mode power and standby mode power, let $P_{W,OFF} = P_{W,SB}$, in which case no separate measurement of off mode power is necessary. The recorded off mode power ($P_{W,OFF}$) shall be rounded to the second decimal place, and for loads greater than or equal to 10W, at least three significant figures shall be reported.

4.0 * * *

4.6.3 Average annual auxiliary electrical energy consumption for vented heaters. For vented heaters with single-stage controls or manual controls, the average annual auxiliary electrical consumption ($E_{AE}$) is expressed in kilowatt-hours and defined as:

$$E_{AE} = BOH_{SS}P_E + E_{SO}$$

where:

$BOH_{SS}$ = as defined in 4.6.1 of this appendix

$P_E$ = as defined in 3.1.3 of this appendix

$E_{SO}$ = as defined in 4.7 of this appendix

4.6.3.1 For vented heaters with two-stage or modulating controls, $E_{AE}$ is defined as:

$$E_{AE}=(BOH_R+BOH_H)P_E + E_{SO}$$

where:

$BOH_R$ = as defined in 4.6.1 of this appendix

$BOH_H$ = as defined in 4.6.1 of this appendix

$P_E$= as defined in 3.1.3 of this appendix

$E_{SO}$ = as defined in 4.7 of this appendix

* * * * *

4.7 Average annual electric standby mode and off mode energy consumption.

Calculate the annual electric standby mode and off mode energy consumption, $E_{SO}$, defined as, in kilowatt-hours:

$$E_{SO} = ((P_{W,SB} * (4160 - BOH)) + (P_{W,OFF} * 4600)) * K$$

where:

$P_{W,SB}$ = vented heater standby mode power, in watts, as measured in section 3.7 of this appendix

4160 = average heating season hours per year

$P_{W,OFF}$ = vented heater off mode power, in watts, as measured in section 3.7 of this appendix

4600 = average non-heating season hours per year

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

BOH = burner operating hours as calculated in section 4.6.1 of this appendix where for single-stage controls or manual controls vented heaters BOH = $BOH_{SS}$ and for vented heaters equipped with two-stage or modulating controls BOH = ($BOH_R$ + $BOH_H$).

6. Appendix P to Subpart B of Part 430 is revised to read as follows:

## APPENDIX P TO SUBPART B OF PART 430–UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF POOL HEATERS

Note: The procedures and calculations that refer to standby mode and off mode energy consumption (i.e., sections 2.2, 2.3, 3.2, 4.2, 4.3, 5.3 equation (3), and 5.4 of this appendix P) need not be performed to determine compliance with energy conservation standards for pool heaters at this time. However, on or after **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**, any representations related to standby mode and off mode energy consumption of these products must be based upon results generated under this test procedure, consistent with the requirements of 42 U.S.C. 6293(c)(2). For pool heaters, the statute requires that after July 1, 2010, any adopted energy conservation standard shall incorporate 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.

1. Definitions.

1.1. Active mode means the condition during the pool heating season in which the pool heater is connected to the power source, and the main burner, electric resistance element, or heat pump is activated to heat pool water.

1.2 IEC 62301 (Second Edition) means 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)

1.3 Off mode means the condition during the pool non-heating season in which the pool heater is connected to the power source, and neither the main burner, electric resistance elements, nor heat pump is activated.

1.4 Seasonal off switch means a switch present on the pool heater that effects a difference in off mode energy consumption as compared to standby mode energy consumption.

1.5 Standby mode means the condition during the pool heating season in which the pool heater is connected to the power source, and neither the main burner, electric resistance elements, nor heat pump is activated.

2. Test Method.

2.1 Active mode. The test method for testing pool heaters in active mode is as specified in section 2.10 of ANSI Z21.56 (incorporated by reference; see §430.3).

2.2 Standby mode. The test method for testing the energy consumption of pool heaters in standby mode is as described in sections 3 through 5 of this appendix.

2.3 Off mode.

2.3.1 Pool heaters with a seasonal off switch.

For pool heaters with a seasonal off switch, no off-mode test is required.

2.3.2 Pool heaters without a seasonal off switch.

For pool heaters without a seasonal off switch, the test method for testing the energy consumption of the pool heater is as described in sections 3 through 5 of this appendix.

3. Test conditions.

3.1 Active mode. Establish the test conditions specified in section 2.10 of ANSI Z21.56 (incorporated by reference; see §430.3).

3.2 Standby mode and off mode. Following the conclusion of the 30-minute active mode test described in section 2.10 of ANSI Z21.56 (incorporated by reference; see §430.3), reduce the thermostat setting to a low enough temperature to put the pool heater into standby mode. Operate the pool heater in standby mode for 60 minutes.

4. Measurements.

4.1 Active mode. Measure the quantities delineated in section 2.10 of ANSI Z21.56 (incorporated by reference; see §430.3). The measurement of energy consumption for oil-fired pool heaters in Btu is to be carried out in appropriate units (e.g., gallons).

4.2 Standby mode. Record the average electric power consumption during the standby mode test, $P_{W,SB}$, in W, in accordance with section 5 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3) and the fossil fuel energy consumption during the standby test, $Q_p$, in Btu. Ambient temperature and voltage specifications of ANSI Z21.56 (incorporated by reference; see §430.3) shall apply to this standby mode testing. The recorded standby power ($P_{W,SB}$) shall be rounded to the second decimal place, and for loads greater than or equal to 10W, at least three significant figures shall be reported.

4.3 Off mode.

4.3.1 Pool heaters with a seasonal off switch. For pool heaters with a seasonal off switch, the average electric power consumption during the off mode, $P_{W,OFF} = 0$, and the fossil fuel energy consumed during the off mode, $Q_{off} = 0$.

4.3.2 Pool heaters without a seasonal off switch. Record the average electric power consumption during the standby/off mode test, $P_{W,OFF}$ (= $P_{W,SB}$), in W, in accordance with section

5 of IEC 62301 (Second Edition) (incorporated by reference; see §430.3), and the fossil fuel energy consumption during the off mode test, $Q_{off}$ (= $Q_p$), in Btu. Ambient temperature and voltage specifications of ANSI Z21.56 (incorporated by reference; see §430.3) shall apply to this off mode testing. The recorded off mode power ($P_{W,OFF}$) shall be rounded to the second decimal place, and for loads greater than or equal to 10W, at least three significant figures shall be reported.

5. Calculations.

5.1 Thermal efficiency. Calculate the thermal efficiency, $E_t$ (expressed as a percent), as specified in section 2.10 of ANSI Z21.56 (incorporated by reference; see §430.3). The expression of fuel consumption for oil-fired pool heaters shall be in Btu.

5.2 Average annual fossil fuel energy for pool heaters. The average annual fuel energy for pool heaters, $E_F$, is defined as:

$E_F = BOH\ Q_{IN} + (POH - BOH)Q_{PR} + (8760 - POH)\ Q_{off,R}$

where:

BOH = average number of burner operating hours = 104 h

POH = average number of pool operating hours = 4464 h

$Q_{IN}$ = rated fuel energy input as defined according to section 2.10.1 or section 2.10.2 of ANSI Z21.56 , as appropriate.

$Q_{PR}$ = average energy consumption rate of continuously operating pilot light, if employed, = ($Q_P$ / 1 h)

$Q_P$ = energy consumption of continuously operating pilot light, if employed, as measured in section 4.2 of this appendix, in Btu

8760 = number of hours in one year

$Q_{off,R}$ = average off mode fossil fuel energy consumption rate = $Q_{off}$ / (1 h)

$Q_{off}$ = off mode energy consumption as defined in section 4.3 of this appendix

5.3 Average annual auxiliary electrical energy consumption for pool heaters. The average annual auxiliary electrical energy consumption for pool heaters, $E_{AE}$, is expressed in Btu and defined as:

(1) $E_{AE} = E_{AE,active} + E_{AE,standby,off}$

(2) $E_{AE,active}$ = BOH * PE

(3) $E_{AE,standby,off} = (POH - BOH)\ P_{W,SB}(Btu/h) + (8760 - POH)\ P_{W,OFF}(Btu/h)$

where:

$E_{AE,active}$ = auxiliary electrical consumption in the active mode

$E_{AE,standby,off}$ = auxiliary electrical consumption in the standby mode and off mode

PE = $2E_c$, if heater is tested according to section 2.10.1 of ANSI Z21.56 , in Btu/h

= 3.412 $PE_{rated}$, if heater is tested according to section 2.10.2 of ANSI Z21.56, in Btu/h

$E_c$ = electrical consumption of the heater (converted to equivalent unit of Btu), including the electrical energy to the recirculating pump if used, during the 30-minute thermal efficiency test, as defined in section 2.10.1 of ANSI Z21.56, in Btu per 30 min.

2 = conversion factor to convert unit from per 30 min. to per h.

$PE_{rated}$ = nameplate rating of auxiliary electrical equipment of heater, in Watts

BOH = as defined in 5.2 of this appendix

POH = as defined in 5.2 of this appendix

$P_{W,SB}$ (Btu/h) = electrical energy consumption rate during standby mode expressed in Btu/h = 3.412 $P_{W,SB}$ , Btu/h

$P_{W,SB}$ = as defined in 4.2 of this appendix

$P_{W,OFF}$ (Btu/h) = electrical energy consumption rate during off mode expressed in Btu/h = 3.412 $P_{W,OFF}$, Btu/h

$P_{W,OFF}$ = as defined in 4.3 of this appendix

5.4 Integrated thermal efficiency.

5.4.1 Calculate the seasonal useful output of the pool heater as:

$E_{OUT} = BOH[(E_t/100)(Q_{IN} + PE)]$

where:

BOH = as defined in 5.2 of this appendix

$E_t$ = thermal efficiency as defined in 5.1 of this appendix

$Q_{IN}$ = as defined in 5.2 of this appendix

PE = as defined in 5.3 of this appendix

100 = conversion factor, from percent to fraction

5.4.2 Calculate the annual input to the pool heater as:

$E_{IN} = E_F + E_{AE}$

where:

$E_F$ = as defined in 5.2 of this appendix

$E_{AE}$ = as defined in 5.3 of this appendix

5.4.3 Calculate the pool heater integrated thermal efficiency ($TE_I$) (in percent).

$TE_I = 100(E_{OUT}/E_{IN})$

where:

$E_{OUT}$ = as defined in 5.4.1 of this appendix

$E_{IN}$ = as defined in 5.4.2 of this appendix

100 = conversion factor, from fraction to percent

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